4937743

4937743

096027	PATENT DATE JUN 26 1990	PATENT NUMBER

SERIAL NUMBER	FILING DATE	CLASS	SUBCLASS	GROUP ART UNIT	EXAMINER
07/096,027	09/10/87	364	401	236	~~FLEMING~~

APPLICANTS

WILLIAM F. GASSMAN, AGOURA, CA; BRADLEY M. BERMAN, OMAHA, NE; SCOTT BLAU, YONKERS, NY; ANDREW CHIANG, FORT LEE, NJ.

CONTINUING DATA********
VERIFIED
GOH

FOREIGN/PCT APPLICATIONS********
VERIFIED
GOH

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MAR 31 1992
OF CORRECTION

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Foreign priority claimed / 35 USC 119 conditions met / Verified and Acknowledged	☐ yes ☒ no / ☐ yes ☒ no / GOH Examiner's Initials	AS FILED	STATE OR COUNTRY	SHEETS DRWGS.	TOTAL CLAIMS	INDEP. CLAIMS	FILING FEE RECEIVED	ATTORNEY'S DOCKET NO.
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TITLE

METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

U.S. DEPT. of COMM.-Pat. & TM Office — PTO-436L (rev. 10-78)

APPLICATION
ARATELY

ALLOWANCE MAILED	PREPARED FOR ISSUE 3/9/90	CLAIMS ALLOWED
2-23-90	Gail O Hayes, Assistant Examiner; M. Capelin, Docket Clerk	Total Claims 61; Print Claim 1

ISSUE FEE		DRAWING		
.00	Date Paid 4-19-90	Sheets Drwg. 9 ~~10~~	Figs. Drwg. 14	Print Fig. 2

JERRY SMITH
SUPERVISORY PATENT EXAMINER
ART UNIT 236
Primary Examiner

ISSUE CLASSIFICATION		ISSUE BATCH NUMBER
Class 364	Subclass 401	020

bel
a

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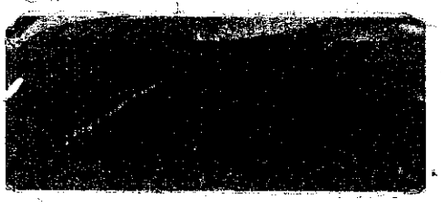
[redacted]



APPROVED FOR LICENSE ☐

INITIALS _____

CONTENTS

		Received or Mailed
1.	Application 10 pts papers.	
2.	Prior Art	Nov 6, 1988
3.	Rej 3 mos	OCT 07 1988
4.	Power to Inspect	1-17-89
5.	Rept 1 mo	1-23-89
6.	Amdt A	1-23-89
7.	[illegible]	1-19-89
8.	Rej 3 Mos	6-27-89
9.	[illegible]	Oct 24 1989
10.	[illegible]	10-16-89
11.	Amdt B [illegible] art appd.	10-16-89
12.	[illegible] Allow	2-23-90 2-28
	[illegible] (9 shts)	3-16-90
	PTO Grant JUN 24	
13.	Req for C of C Rule 323	10/12/90
	Approved as indicated	2-11-92
14.		

SEARCHED

Class	Sub.	Date	Exmr.
364	401	9-5-88	GOH
	518		
434	108	"	"
update		4-21-89	GOH
update		2-10-90	GOH
	"	2-12-90	GOH

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
364	408	2-15-90	GOH
	518		
434	108	"	"

SEARCH NOTES

Date	Exm
9-5-88	GO
4-21-89	

(1) Project management software best art, PC Mag. best art.

See [illegible]

Comp. Searches APS & Orbit (Micro search). Nothing really relevant on APS

1, Program (s) management
2 all schedul!
3 1 and 2 (364)
4 2 (s) conflict (2)
5 all resource #
6 all equipment #
7 (1)(F) (2) (15)
8 3 (F) 1 (10) *
9 all schedul! (8) ;
(all resource# or allocation#)

Staple Issue Slip Here

INDEX OF CLAIMS

Claim Final	Claim Original	Date 9-7-88	Date 6-26-89	Date 12-14-90
1	(1)	✓	✓	✓
14	(2)	✓	✓	✓
15	3	✓	✓	✓
16	4	✓	✓	✓
2	5	✓	✓	✓
17	6	✓	✓	✓
18	7	✓	✓	✓
19	8	✓	✓	✓
20	9	✓	✓	✓
21	10	✓	✓	✓
12	11	✓	✓	✓
25	(12)	✓	✓	✓
26	13	✓	✓	✓
27	14	✓	✓	✓
28	15	✓	✓	✓
29	16	✓	✓	✓
30	17	✓	✓	✓
35	(18)	✓	✓	✓
36	19	✓	✓	✓
37	20	✓	0	—
38	21	✓	✓	—
46	22	✓	✓	—
42	23	✓	✓	—
39	24	✓	✓	—
48	25	✓	0	—
50	26	✓	✓	0
40	27	—	✓	0
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33	31	✓	✓	✓
52	32	✓	✓	✓
53	33	✓	✓	✓
54	34	✓	✓	✓
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23	38	—	—	—
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9	44	—	✓	✓
16	45	—	✓	0
11	46	—	✓	0
8	47	—	✓	0
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13	49	—	✓	✓

Claim Final	Claim Original	Date 6-26-89	Date 12-14-90
34	51	✓	✓
47	52	✓	0
44	53	0	✓
24	54	✓	✓
51	55	✓	✓
10	56	✓	✓
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60	58	✓	✓
61	59	✓	✓
13	60	✓	✓
57	61	—	—
	62		
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United States Patent [19]

Rassman et al.

[11] **Patent Number: 4,937,743**

[45] **Date of Patent: Jun. 26, 1990**

[54] **METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES**

[75] Inventors: **William R. Rassman**, Agoura, Calif.; **Bradley M. Berman**, Omaha, Nebr.; **Scott Blau**, Yonkers, N.Y.; **Andrew Chiang**, Fort Lee, N.J.

[73] Assignee: **IntelliMED Corporation**, Fort Lee, N.J.

[21] Appl. No.: **96,027**

[22] Filed: **Sep. 10, 1987**

[51] **Int. Cl.**[5] **G06F 15/21**

[52] **U.S. Cl.** **364/401**; 364/518

[58] **Field of Search** 364/401, 518; 434/108

[56] **References Cited**

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4,336,589	6/1982	Smith et al.	364/403
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4,591,983	5/1986	Bennett et al.	364/403
4,646,238	2/1987	Carlson, Jr. et al.	364/403
4,700,318	10/1987	Ockman	364/518

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"CSL Scheduling", Chancery Software Ltd, Abstract citation from Microsearch File of Orbit, AN: 87-040814.

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Primary Examiner—Jerry Smith

Assistant Examiner—Gail O. Hayes

Attorney, Agent, or Firm—Fitzpatrick, Cella, Harper & Scinto

[57] **ABSTRACT**

The invention relates to the method for the prospective scheduling, periodic monitoring and dynamic management of a plurality of interrelated and interdependent resources using a computer system. The method includes providing a data base containing information about the resources and graphically displaying utilization and availability of the resources as a function of time. Indicia can be made to appear on the display to provide visual identification of symbols as well as information about scheduling, status and conflicts involving the resources. In addition, access to the data base can be made available to provide a continuous update of the display so that the display of the resources is for the most recent data in the data base. Access to the data base can also permit the operator to call up a wide variety of information about the resources and can also be used to track events and procedures.

61 Claims, 9 Drawing Sheets

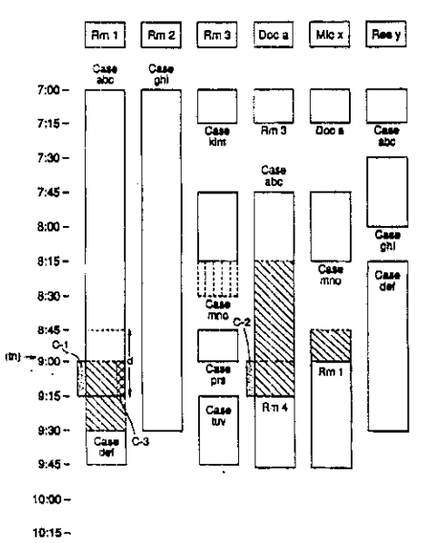


FIG. 1.

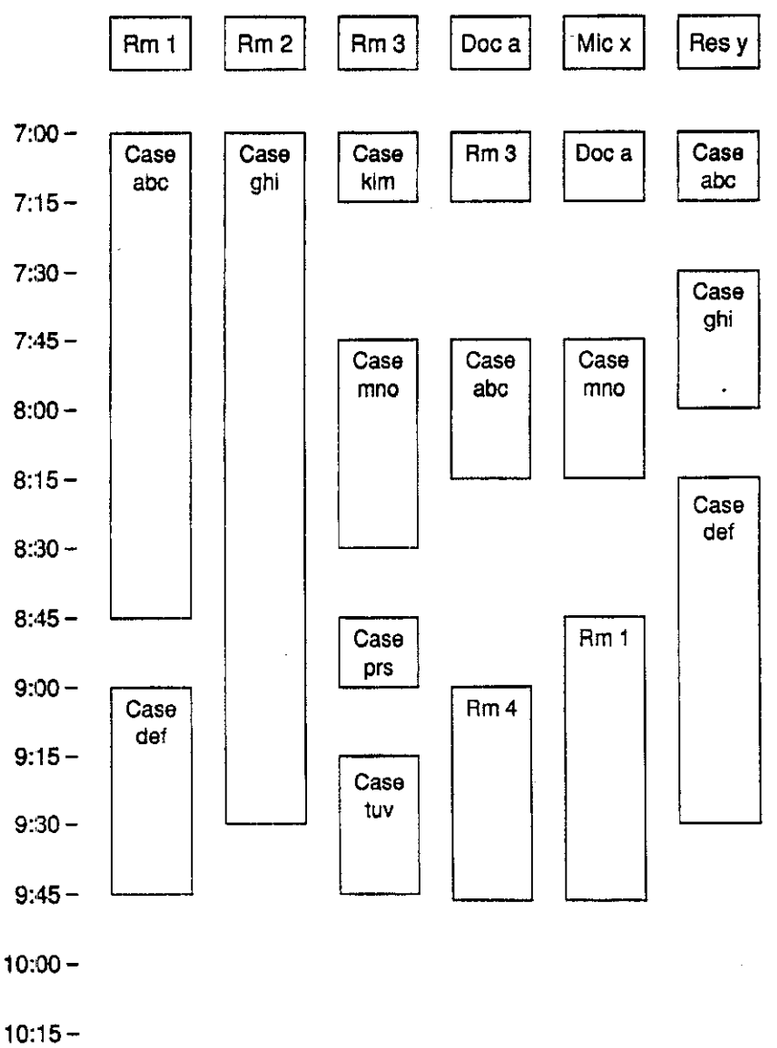

Rm 1
Rm 2
Rm 3
Doc a
Mic x
Res y
7:00
7:15
7:30
7:45
8:00
8:15
8:30
8:45
9:00
9:15
9:30
9:45
10:00
10:15
Case abc
Case def
Case ghi
Case kim
Case mno
Case prs
Case tuv
Rm 3
Case abc
Rm 4
Doc a
Case mno
Rm 1
Case abc
Case ghi
Case def

FIG. 1A.

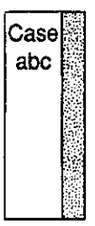


FIG. 1D.

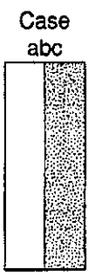
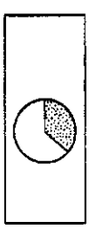


FIG. 1B.

FIG. 1E.



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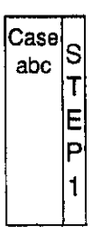


FIG. 2.

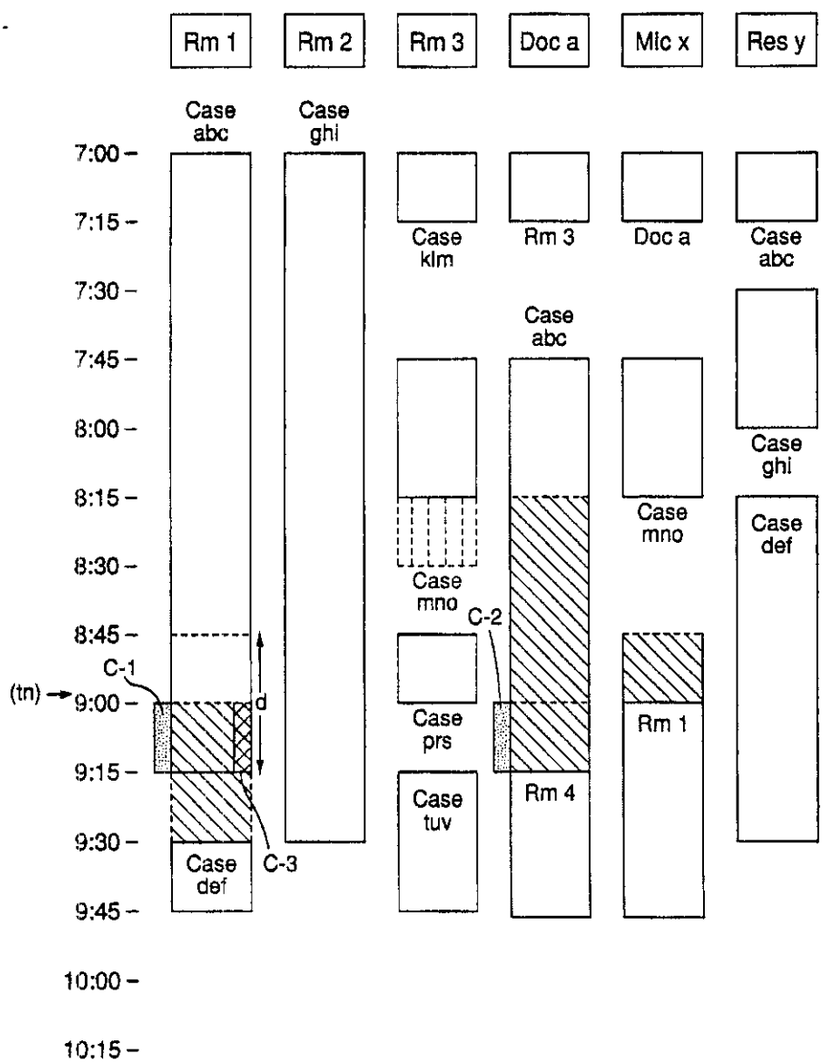

Rm 1
Rm 2
Rm 3
Doc a
Mic x
Res y
Case abc
Case ghi
Case klm
Rm 3
Doc a
Case abc
Case abc
Case ghi
Case mno
Case def
Case mno
C-2
Case prs
Rm 1
Case tuv
Rm 4
C-1
(tn)
d
C-3
Case def
7:00
7:15
7:30
7:45
8:00
8:15
8:30
8:45
9:00
9:15
9:30
9:45
10:00
10:15

FIG. 3.

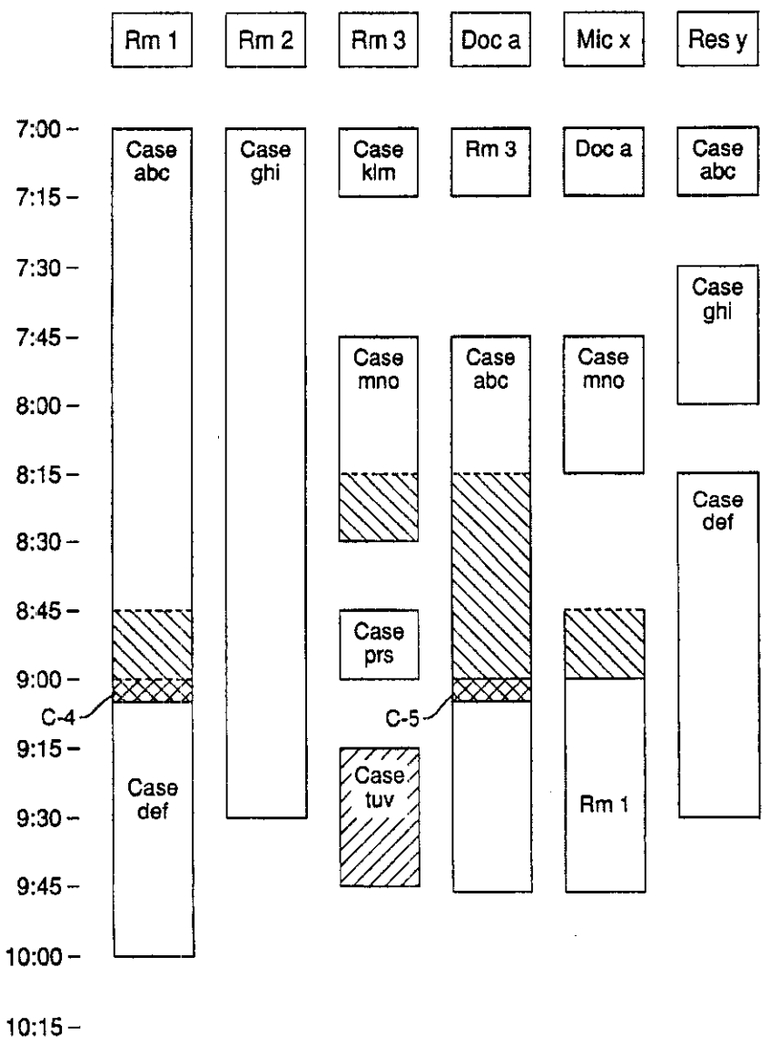

Rm 1
Rm 2
Rm 3
Doc a
Mic x
Res y
7:00
7:15
7:30
7:45
8:00
8:15
8:30
8:45
9:00
9:15
9:30
9:45
10:00
10:15
Case abc
Case def
Case ghi
Case klm
Case mno
Case prs
Case tuv
C-4
C-5
Rm 3
Case abc
Doc a
Case mno
Rm 1
Case abc
Case ghi
Case def

FIG. 4.

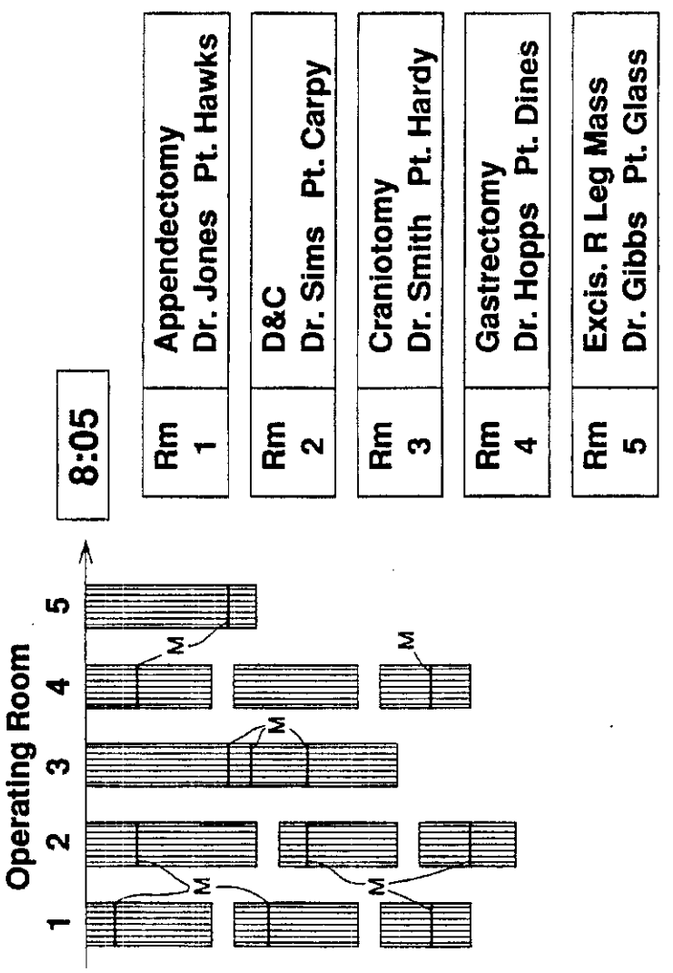

8:05
Rm 1
Appendectomy
Dr. Jones Pt. Hawks
Rm 2
D&C
Dr. Sims Pt. Carpy
Rm 3
Craniotomy
Dr. Smith Pt. Hardy
Rm 4
Gastrectomy
Dr. Hopps Pt. Dines
Rm 5
Excis. R Leg Mass
Dr. Gibbs Pt. Glass
Operating Room
1
2
3
4
5
M

FIG. 5.

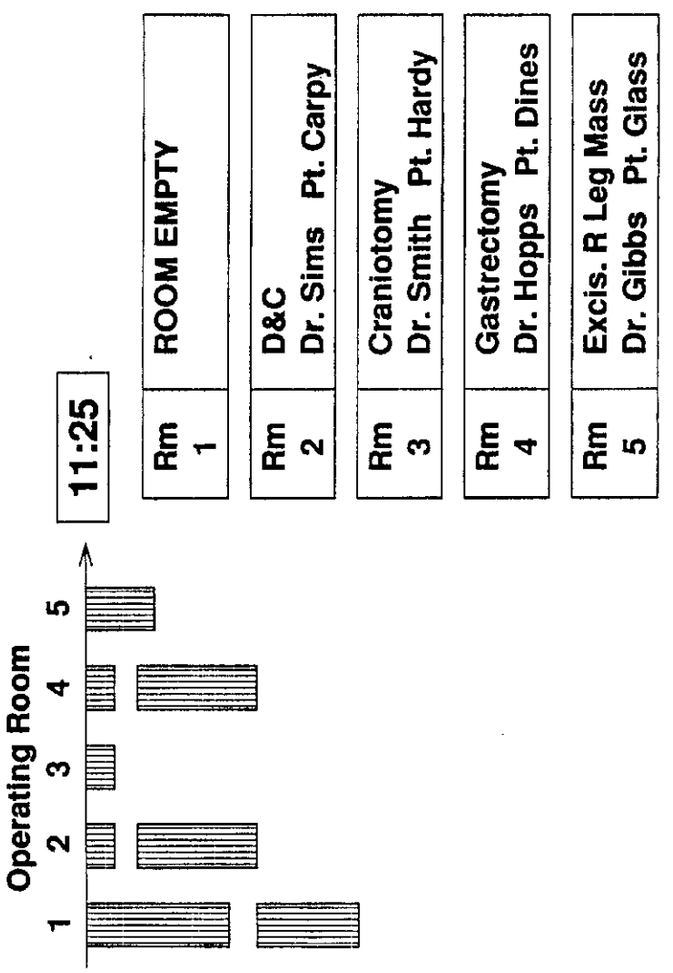

11:25
Rm 1
ROOM EMPTY
Rm 2
D&C
Dr. Sims Pt. Carpy
Rm 3
Craniotomy
Dr. Smith Pt. Hardy
Rm 4
Gastrectomy
Dr. Hopps Pt. Dines
Rm 5
Excis. R Leg Mass
Dr. Gibbs Pt. Glass
Operating Room
1
2
3
4
5

FIG. 6.

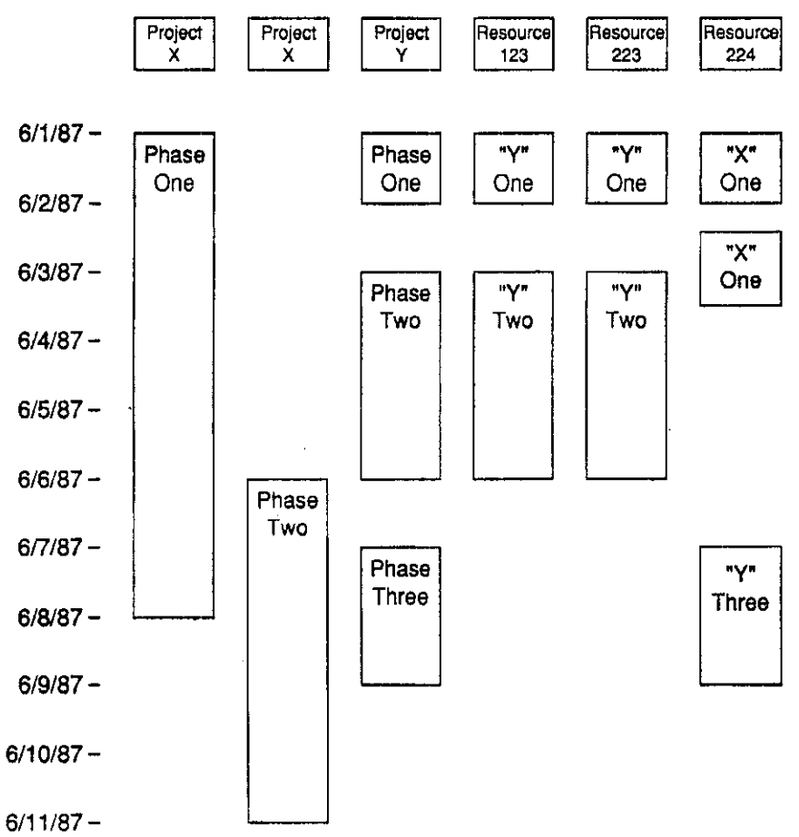

Project X
Project X
Project Y
Resource 123
Resource 223
Resource 224
6/1/87
6/2/87
6/3/87
6/4/87
6/5/87
6/6/87
6/7/87
6/8/87
6/9/87
6/10/87
6/11/87
Phase One
Phase Two
Phase One
Phase Two
Phase Three
"Y" One
"Y" Two
"Y" One
"Y" Two
"X" One
"X" One
"Y" Three

FIG. 7.

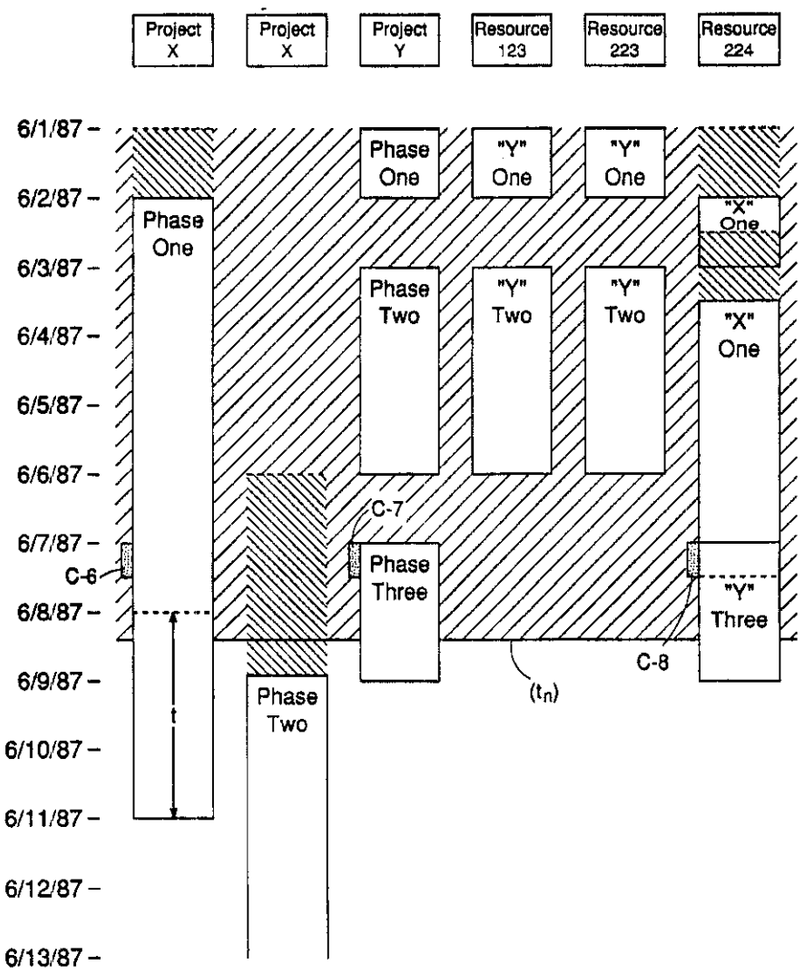

Project X
Project X
Project Y
Resource 123
Resource 223
Resource 224
6/1/87
6/2/87
6/3/87
6/4/87
6/5/87
6/6/87
6/7/87
6/8/87
6/9/87
6/10/87
6/11/87
6/12/87
6/13/87
Phase One
Phase One
"Y" One
"Y" One
"X" One
Phase Two
"Y" Two
"Y" Two
"X" One
C-7
C-6
Phase Three
"Y" Three
C-8
(t_n)
t
Phase Two

FIG. 8.

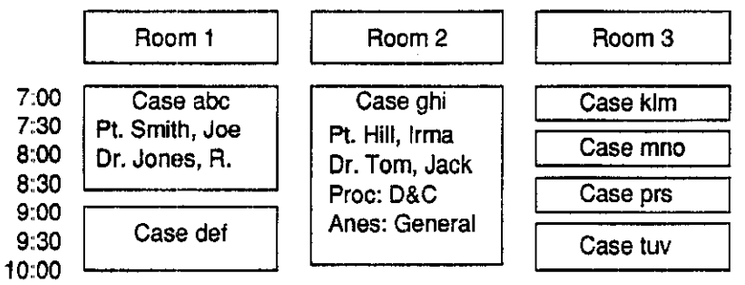
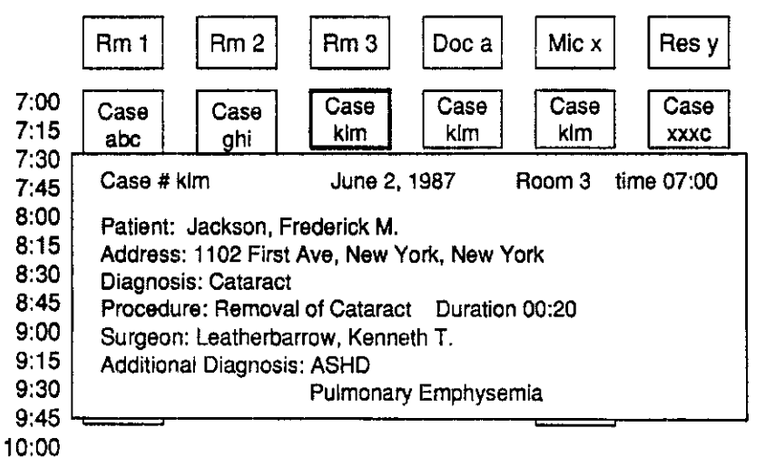

Room 1
Room 2
Room 3
7:00
7:30
8:00
8:30
9:00
9:30
10:00
Case abc
Pt. Smith, Joe
Dr. Jones, R.
Case def
Case ghi
Pt. Hill, Irma
Dr. Tom, Jack
Proc: D&C
Anes: General
Case klm
Case mno
Case prs
Case tuv

FIG. 9.


Rm 1
Rm 2
Rm 3
Doc a
Mic x
Res y
7:00
7:15
7:30
7:45
8:00
8:15
8:30
8:45
9:00
9:15
9:30
9:45
10:00
Case abc
Case ghi
Case klm
Case klm
Case klm
Case xxxc
Case # klm
June 2, 1987
Room 3
time 07:00
Patient: Jackson, Frederick M.
Address: 1102 First Ave, New York, New York
Diagnosis: Cataract
Procedure: Removal of Cataract Duration 00:20
Surgeon: Leatherbarrow, Kenneth T.
Additional Diagnosis: ASHD
Pulmonary Emphysemia

METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

FIELD OF INVENTION

The invention relates to a method for managing resources and particularly to the method and system for the prospective scheduling and real time dynamic management of a plurality of interdependent and interrelated resources using a computer system for communicating information.

BACKGROUND OF THE INVENTION

Many different fields require the management of resources in order to carry out programs and schedule activities effectively and efficiently. For example, the construction of a building requires scheduling the use of general and specialized personnel, of particular pieces of equipment and of delivery vehicles. In addition, a number of these resources may have to be shared with other construction projects at other sites. It also involves managing the rescheduling of the use of those resources as time passes and events unfold, often not in accordance with the original schedule.

Similarly, the efficient and effective use of surgical operating rooms in a hospital requires coordinating the use of numerous different resources, usually requiring collecting and gaining access to and then making use of information derived from many different sources. Some of the resources which must be managed and coordinated in a surgical suite or wing include the operating rooms, the surgeons, the anaesthesiologists, the residents, the nurses, the technicians, specialized pieces of equipment and the like.

In the last decade, there has been a significant increase in the use of computers and computer display systems for accessing and displaying data. For example, U.S. Pat. No. 3,725,650 discloses a method and arrangement for visually representing industrial management data. This patent teaches the use of a computer display for representing data in the form of bar-graphs or pie-graphs. The displays are for past and real time data and do not include projections into the future. In addition, each graph is independent of each other graph so that the impact of a change in one will not affect another. There is no suggestion in this patent that the method therein disclosed could be used for prospective or dynamic management of the utilization of resources.

U.S. Pat. No. 4,646,238 relates to a computerized system for planning the testing and grading of products as part of a manufacturing process. This patent does not disclose any system for prospectively scheduling the utilization of resources, nor does it disclose any method for monitoring actual utilization of resources, nor does it disclose a system where scheduling conflicts are noted.

U.S Pat. No. 4,547,851 relates to interactive communications systems used in restaurants for processing food orders by patrons and for making entertainment, like video games available to patrons. It does not relate to resource scheduling, either prospectively or dynamically.

U.S. Pat. No. 4,591,983 discloses a hierarchical knowledge system and does not appear to pertain at all to scheduling of interrelated and interdependent resources.

U.S. Pat. No. 4,336,589 discloses a method and system for monitoring and controlling the flow of articles in a warehouse. It is designed primarily to keep track of orders and of the articles ordered as they are taken from stock and prepared for shipment. There is no suggestion that such a system could be used for resource scheduling, management or monitoring.

Project planners which employ computers are also well known. Such project planners most commonly are task or activity focused. They are designed primarily for sequential scheduling of related tasks. For example, if a construction project must proceed through six phases, and phase 2 cannot begin until phase 1 is § complete, and phases 3, 4 and 6 each must await completion of the preceding phase, but phase 5 can begin simultaneously with phase 4, a project planner could be used to set up the schedule at the outset and to adjust that schedule to reflect slippages as they occur. Project planners, however, are not well equipped to manage the resources employed in the various activities or to alert the operators to the need to adjust the scheduled activities in response to other demands upon those resources.

The management of resources, utilization of which can change in time and can have complex interrelationships, can present serious problems to effective scheduling of the use of those resources and the tasks or activities in which they are employed. Inefficient and particularly incompatible solutions to these problems can be very costly in a manufacturing setting, in the construction of a building and elsewhere. Inappropriate solutions to such. problems become far more serious when they involve medical facilities and the performance of surgery because they can then present life and death issues.

What is needed is an effective display of at least some of the available resources as a function of time associated with a data base of information relating to displayed resources and perhaps to others as well. In addition, such a system should, most advantageously, be capable of being accessed in order to produce additional displays relating to additional resources. In one of its more general forms, such a system should permit changing the time scale to accommodate widely diverse applications. Most desirably, it should also be able to display short range as well as long range projected (and/or historical) utilization without distorting relationships between displayed data when going from short to long range or vice versa.

Additionally, and, in some settings, most importantly, the system should be capable of showing interrelationships between resources so that changes in utilization of one or more resources, reveal the impact of those changes upon the availability and utilization of other resources as well as upon anticipated future utilization of the same resource and upon the activities in which they are employed.

SUMMARY OF THE INVENTION

The invention relates to a method for the dynamic management of a plurality of resources, preferably using a computer system. The method includes providing a data base that includes information about the available resources and graphically displaying anticipated and/or actual utilization of the resources as a function of time. Generally, the displays can be in the form of bar graphs, pie charts, line graphs or other geometric shapes. Various types of indicia may be employed to provide visual auditory or other sensory communica-

tion of information pertinent to the resources and/or the utilization thereof. "Scheduling indicia" may be used to indicate utilization (historical and/or prospective) of resources, "status indicia" may be employed to reflect current status of events and "conflict indicia" may be used to alert operators to scheduling conflicts. In one of its preferred configurations, the invention contemplates providing access to a data base to permit continuous updating of the information stored therein so that when resource utilization is displayed it reflects the most recent data in the data base.

In another embodiment, the method and system of this invention gives access to the data base in order to provide information, beyond that appearing on the display, relative to a selected resource. Provision can also be made for selectively changing the display in order to present data relating to different aspects of one or more resources.

Further, the invention contemplates the automatic adjustment of schedules as conflicts arise as well as the automatic communication of those adjustments. It also contemplates automatic notification to relevant personnel and automatic initiation of activities (cutting a purchase order, turning on a furnace etc.) and procedures upon reaching certain milestone points.

The system can also incorporate accountability means whereby it can be determined whether resources are being used properly and procedures are being followed in accordance with established rules. In addition, a record keeping function can be incorporated to document what resources were used, for what procedures, by whom and when.

Of course, not every application of this invention will necessarily incorporate all of the above features. It is anticipated that some applications will have need for only some of the features and other, more complex or more sophisticated or more automated applications will make use of more of the features contemplated by the instant invention.

BRIEF DESCRIPTION OF THE DRAWINGS

A description of the invention will be given in connection with the drawings which include:

FIG. 1 shows a prospective display of scheduled resources in accordance with the invention.

FIG. 1A shows one of the cells from FIG. 1 after the first milestone has been completed.

FIG. 1B shows one of the cells of FIG. 1 with the identifying label having been moved to above the cell to denote that the patient is in the room.

FIG. 1C shows the same information as in FIG. 1A, but using a different means to indicate completion of milestone 1.

FIG. 1D shows the same cell as FIG. 1A, but at a later point in time, after the second milestone has been passed.

FIG. 1E shows a cell in which a circle or clock face is used to display status indicia.

FIG. 2 shows the schedule of FIG. 1 as a dynamic display, modified in accordance with the present invention by events as they have occurred.

FIG. 3 shows the schedule of FIG. 1 after completion. It is an historical record generated in accordance with the present invention, showing not only what took place, but also how reality varied from projected utilization.

FIG. 4 shows an alternative method for graphically displaying scheduling information while simultaneously displaying in textual form, information about the scheduled resources.

FIG. 5 shows the display of FIG. 4 at a later point in time.

FIG. 6 shows a display of a prospective schedule of industrial projects in accordance with the invention.

FIG. 7 shows an dynamic display of the schedule of FIG. 6, modified to take into account some events as they have occurred.

FIG. 8 shows a reconfigured display of some of the information appearing on FIG. 1.

FIG. 9 shows a display wherein a pop-up window, overlayed upon the display of FIG. 1, shows information about case klm.

DISCUSSION OF THE INVENTION

The method according to the invention enables dynamic control of a complex project involving a plurality of resources which are interrelated and which can change with time. Preferably, the method utilizes a display system such as the type associated with a personal computer and a keyboard for selectively changing the display. In addition, a data base containing data relating to the resources can be made available. The data base can be updated from one or more real time sources and this in return can result in an update of the data being displayed. The keyboard can also be used to input data to the data base and to do prospective scheduling. The data preferably is displayed graphically as a function of time to portray the temporal relationships between various resources, activities and events.

Inputting, modifying, handling and accessing of the data can be carried out using known methods and techniques. Similarly, generating appropriate graphical displays can be done by using well known techniques.

There are numerous situations which can effectively be managed by the use of the instant invention. One such situation is monitoring and planning the use of the facilities and other resources available in the surgical suite of a hospital. Each operating room represents a resource and information can be provided in the data base about each operating room. For example, some operating rooms may be limited to ambulatory procedures, some may be specifically designed and equipped for open heart surgery, some may require only 15 minutes for clean up between procedures and others might need 20 minutes. Some specialized pieces of equipment may be limited to use in only some of the operating rooms. Some equipment may require long periods of sterilization between procedures, while others require none. Also, some resources may be unavailable because of construction, repair or maintenance activities. If the particular application calls for a rule-based system (as will be discussed below), the applicable rules would normally be in the knowledge or data base. Preferably, all such information would be included in a primary or semi permanent data base.

The primary data base could also include standard information about certain known activities or procedures. For example, it may include information like: an appendectomy should be scheduled to take 90 minutes, requires that medications A, B, C and D be available, that only operating rooms X, Y and Z are suitable for such a procedure and that only doctors J, K and L are authorized to perform such operations.

A supplemental, or transitory data base, preferably integrated with the primary data base, can also be employed to store information more frequently changed

than the information in the primary data base. The transitory data base could include information about the planned utilization of a given resource on a particular day or at a particular time. Tasks or procedures waiting to be scheduled could also be in the transitory data base. It could also include relevant information about a particular patient (e.g., name, doctor, procedure to be performed, allergies) who is scheduled for surgery. If anything in the planned utilization is incompatible with information in either the primary or secondary data base, a conflict indicator can be made to appear on the display or on audible signal given. For example, if the procedure is schedule for a room in which construction is going on, a conflict indicator would be displayed. Similarly, if the patient is allergic to medication that is called for, a conflict indicator would alert the operator of the system to the problem.

Each surgical operating room has a planned use in time and the intended use may be associated with a particular patient, pieces of equipment and procedure, as well as key personnel who will be involved in performing the operation and the medication to be administered.

Each surgeon also represents a resource and the surgeon's prior commitments may be important for determining the availability of the surgeon for other surgical operations or in case of an emergency. In the same way, a patient can be regarded as a resource and the planned locations and activities of the patient can be displayed so that the patient can easily be located. Similarly, pieces of equipment and key personnel can be treated as resources. All this information would normally be put in the supplemental data base and would then be searched along with the primary data base, each time a resource is scheduled for use and each time a schedule is modified.

As can readily be appreciated, it is not unusual for the actual time taken to complete a particular procedure to vary from the scheduled or anticipated time. If the actual time exceeds the projected time, such information should be readily available in order to determine if alternate arrangements must be made. For example, such a deviation could affect subsequent scheduled use of the operating room. In addition, the extended involvement of the patient, the surgeon, key personnel and particular pieces of equipment could have an impact on other surgical procedures which have been planned for that surgeon, those personnel and those pieces of equipment. It could also affect other procedures that might have been scheduled for that patient.

As used herein, a "resource" in the hospital setting could be a room, a person, a piece of equipment, or the like. In other settings, "resources" could include containers, vehicles, supervisors, workers units of goods, blocks of time, dollars, aircraft, boarding gates, pilots and the like. Some resources may be reusable, others may be subject to depletion, and still others may be renewable. Generally, a resource has a known and/or anticipated availability and can be related to one or more other resources as a function of time or as a function of some other consumption, depletion or saturation. As those skilled in the art will readily appreciate, consumption, depletion, saturation and the like are analogous to time in that each can be used as a measuring yardstick. For example, a work day can be viewed as consisting of 32 fifteen minute blocks of time during which activities can be scheduled and resources used. Similarly, a reservoir of 2000 items may be viewed as consisting of 500 groups of 4, with various activities and resources scheduled for utilization as different groups of 4 are consumed. The term "time," as used herein, should be understood in its broadest sense and not limited to measurements based upon rotations of the earth.

The availability and utilization of resources can be displayed as a function of time by use of "scheduling indicia". Progress of a planned procedure can be monitored and displayed by use of "Status indicia." Incompatible scheduling of resources can be signalled by the displaying of "conflict indicia." Any of the several indicia, scheduling, status or conflict, described herein, can be displayed in a myriad of ways, including color changes, color bars, shadings, alphanumerics and the like, and combinations thereof. The several indicia can also be displayed by the use of highlighting, geometric symbols, flashing, and/or enhancements such as a brightened frame around data.

While the operator of the system can select certain resources for primary display purposes, the system monitors utilization, not only of the displayed primary resources but also of other or secondary resources which may or may not appear on the display, but which are used in conjunction with the displayed primary resources. To illustrate, the operator may choose to display "operating rooms" as the primary resources. One of those operating rooms, 0, however, may require surgeon S, anaesthesiologist A, heart/lung machine H and heart monitor M. Resources S, A, H and M may be referred to as secondary resources. If the procedure scheduled for room 0 takes longer than expected, the system will display conflicts, not only with respect to the primary resource, operating room 0, but also with respect to scheduled utilization of the secondary resources, surgeon S, anaesthesiologist A, heart/lung machine H and monitor M. The system can, of course, be so configured as to suppress one or more of these indicia.

In using the system of the instant invention, the operator collects information from various sources concerning needs or requests for use of the resources. In the context of a hospital surgical suite this might involve requests from surgeons for operating rooms, for pieces of equipment, perhaps for particular staff members and for other physicians, such as anaesthesiologist's. Each surgeon would identify the procedure to be performed, the anticipated time to complete the procedure, patient information and other relevant data. Other information might also be supplied, such as other commitments of involved personnel.

The operator loads this information into the data base in any conventional manner and then proceeds to schedule the various resources. If an attempt is made to set up a schedule that involves apparently inconsistent or incompatible use of a given resource, a conflict indicator would be displayed. Having thus been alerted, the operator would then either revise the proposed schedule or determine whether the conflict is real or only apparent.

To illustrate the difference between real and apparent conflicts, consider the situation of a surgeon employing a new procedure which only a few people have been trained to use. The new and unique aspect of the overall surgery may take only 30 minutes of an anticipated 3 hour surgery. The other steps to be performed, e.g., opening the patient in preparation for the critical procedure, stabilizing the patient on the heart/lung machine and closing the wound after the new procedure has

been completed, could be performed by other surgeons. Nevertheless, since the operating room would normally be assigned to the primary surgeon for the entire 3 hour period, the system would display a conflict indicator if that primary surgeon were scheduled elsewhere during any part of those 3 hours. In the real world, however, that surgeon's personal presence might only be required for 30 minutes, thereby allowing him to discharge other duties during the remaining 2½ hours when the operating room is being used in his name.

Recognizing that some conflicts may be real and others only apparent, the system and method of the present invention can be made to recognize different kinds of conflicts, some which it "knows" are irreconcilable, some which it "knows" are susceptible of accommodation and some which it is unable to "recognize" as falling in either category. Each type of conflict could be indicated by its own unique conflict indicia. With that kind of information displayed, the operator can tell whether to reschedule resources immediately or whether to check further to see if a real conflict exits.

After collecting and usually, but not necessarily, after loading the relevant information into the data bank, the operator decides which resources are to be "primary" for display purposes and which are to be "secondary". In the hospital setting the operator may select "operating rooms" for display as the primary resources. Alternatively, "surgeons" or "heart/lung machines" or "CT scanners" or "nuclear magnetic imagers" etc. or some combination thereof might be chosen.

Assume, for illustration purposes, "operating rooms" is selected for display as the primary resources. Initially, the screen will display only the two axes—time (down the left margin), and operating rooms (across the top as column headings). Although at the outset the remainder of the display would normally be blank, it need not be. For example, for each unscheduled block of time the display can be made to show "open" or some equivalent designation. Also "repair" may be used to reflect that a particular room is not available for scheduling. Designations such as "repair," "construction" "sabatical" could be made to appear automatically as long as the requisite information has been stored in the data base.

The operator would then proceed to prepare a schedule, beginning with "Case abc" for operating room 1. The operator could schedule that case to begin at 7:00 a.m. and to end at 8:45 a.m. Or, if the information as to "Case abc" had already been loaded into the data base, once the starting time had been selected, an automatic search of the data base could cause the system to calculate and display the end point. In either case, a scheduling indicator would be displayed to reflect utilization of the primary resource, in this instance, "Rm 1". In FIG. 1, the vertical rectangle, labeled "Case abc" is the scheduling indicator. In similar fashion, the remaining operating rooms could be scheduled and scheduling indicia displayed. As long as nothing is planned for one of the primary resources at a particular time, the blank screen or "open" at that location would constitute the scheduling indicator.

During the scheduling of the primary resources, the system can be made to monitor conflicts in utilization involving primary as well as secondary resources. If such conflicts are detected, a conflict indicator will be displayed. The conflict could involve only primary resources, e.g. two procedures scheduled for the same operating room at the same time. In that event, the operator would be able to detect the nature of the conflict on the display. However, the conflict could involve secondary resources, some of which may not appear on the display. In that event, the operator would be alerted to look for the conflict among the secondary resources. Alternatively, by use of color, shading, shape positioning or the like, the conflict indicia itself can identify the secondary resource which is the source of conflict.

On the display, a scheduling indicator showing planned or actual use of a particular primary resource during a given block of time can be referred to as a "cell". On FIG. 1 the rectangle showing that "Case abc" is scheduled for Room 1 from 7:00 to 8:45 a.m. would be a "cell". Each cell could be given a title which could be made to appear above the cell or within its confines. Space permitting, a cell could also be made to have several pieces of data relating to secondary resources displayed therein. For example, within the cell that represents "Case abc" the name of the surgeon or the type of equipment being employed could be displayed.

In the event it is decided to display secondary resources within cells, such secondary resource displays could be used to indicate conflicts. For example, if Doctor S were scheduled simultaneously in two operating rooms, the display of Doctor S as a secondary resource in either or both of those cells could be made to flash. Such flashing would, in that embodiment, constitute the conflict indicia.

The display of secondary resources could also be employed to make additional options available. For example, instead of having to go through a menu, simply by moving the cursor to one of those displayed secondary resources, the system could be made to display a window with that secondary resource s schedule or other information about that secondary resource. Such a window is shown in FIG. 9.

Thus, the system need not be menu driven. The use of shortcuts, such as displays of secondary resources within cells, may avoid the use of menus. However, in the more complex and/or more sophisticated applications of the instant invention, it is unlikely that sufficient short-cuts can effectively be used so as to avoid all use of menus.

In the displays illustrated in FIGS. 1 through 3 and 6 through 8, along the Y axis time is shown running from top to bottom, and along the X axis the primary resources are shown. As will readily be understood, which resources to display, and along which axis is a matter of choice and convenience. Similarly, the time intervals can be selected to match the needs of the application. Moreover, as illustrated in FIGS. 4 and 5 those time intervals need not even be displayed.

Turning now to FIG. 1, the display depicts a mixture of resources and their availability in time. The resources are labeled across the top using abbreviations in which "Rm" is room, "Doc" refers to a medical surgeon, "Mic" refers to a particular type of apparatus, namely a microscope and "Res" refers to some other piece of equipment.

The time is shown at the left in FIG. 1, starting with 07:00, based on a 24-hour clock. It is usually most convenient to have all of the primary resources in a display of the same type, such as rooms. However, such uniformity is not essential. As can be seen, the primary resources selected for display in FIG. 1 are of three different types. The primary resources in the first three columns, "Rm 1", "Rm 2", and "Rm 3", are of one type, but the the primary resources of the last three columns,

are of two other types. The primary resource of column 4 is a surgeon and the primary resources of columns 5 and 6 are pieces of equipment.

In FIG. 1, "Rm 1" can be taken to refer to a surgical operating room. At 07:00 in the morning "Case abc" is scheduled to occupy "Rm 1" until 08:45. Thereafter, "Case def" will be in "Rm 1" from 9:00 until 09:45.

Rm 2 has "Case ghi" from 07:00 to 09:,30. Rm 3 has "Case klm" from 07:00 to 07:15 which is followed by "Case mno" from 07:45 to 08:30. "Case prs" follows from 08:45 to 09:00 and then "Case tuv" from 09:15 to 09:45.

While there may be many surgeons involved, only the activities of the surgeon "Doc a" are shown. "Doc a" will be in Rm 3 from 7:00 to 7:15, involved in "Case abc" from 7:45 to 8:15 and in Rm 4 (not displayed) from 9:00 to 9:45. "Mic x" will be used by "Doc a" from 7:00 to 7:15, will be used for "Case mno" from 7:45 to 8:15 and will be in room 1 from 8:45 to 9:45. Also, the resource "Res y" will be used for "Case abc" from 7:00 to 7:15 (even though "Case abc" will continue long after 7:15) and will then be moved for use in "Case ghi" (already in progress) from 7:30 to 8:00. Resource "Res y" is then shown as being assigned to "Case def" from 8:15 to 9:30. Although "Case def" is not scheduled to begin until 9:00, keeping "Res y" available for that case from 8:15 does not necessarily represent a conflict, although it may represent a waste of a valuable asset. Depending upon the needs of the particular application, such scheduling of "Res y" could, but need not, trigger the display of a conflict indicator.

In FIG. 1, "Case abc" is scheduled from 7:00 to 8:45. "Doc a" is scheduled to be involved in that case, but only from 7:45 to 8:15. He is also scheduled for "Rm 3" ("Case klm") from 7:00 to 7:15. If "Case abc" is Doc a's case, then when the operator tried to schedule him for Rm 3 ("Case klm") from 7:00 to 7:15 a conflict indicator would have been displayed. The operator would then have checked, determined that Doc a was needed in Rm 1 ("Case abc") only from 7:45 to 8:15 and then overridden or suppressed the conflict indicator.

The display in FIG. 1 represents the results of a prospective scheduling of activities and has been presented for a predetermined time period. Revising the time scale (from 15 minute to 30 minute intervals, for example) will allow the operator to see further into the future but will result in the size of the scheduling indicia to be physically reduced. The distances between cells under each resource will also shrink so that resolution of adjacent cases in time may not be discernible. Such shrinking of the time scale will also permit less information, for example, about secondary resources, to be displayed within each cell.

Time scale compression may also trigger conflict indicia. For example, if the scale of FIG. 1 were changed from 15 minute intervals to one hour intervals, conflict indicia would be displayed between several of the cells, including "Case abc" and "Case def" in Rm. 1. Each cell would be occupying a portion of the time block 8:00 to 9:00.

The use of conflict as well as status indicia to communicate data permits communication of multi-dimensional information on a two dimensional display. Some of the data which cause the display of conflict or status indicia may be drawn from the semi-permanent data base, some may be from the transitory data base and some may be from current or real time inputs.

In a hospital surgical wing application, as well as in many other applications to which the instant invention can be put, inclusion of an internal real-time clock would be quite advantageous. For example, such a clock could be used to tell the operator which resources are in use and which ones are available at the time of viewing. It could also enable the viewer to determine where a particular resource, such as "Doc a" is at the present time. In addition, the inclusion of a real-time clock can enable automatic display of conflict indicia.

If timely information is available, status indicia can be used to monitor and display progress of a procedure. The entry of the patient into the operating room could be signalled by use of the identifying label. "Case abc" could be blue before the patient enters, orange as long as the patient is in the room and red after the patient has left. Alternatively, the label could be moved from within the cell to a site just above it to signify that the patient is in the room (FIG. 1B). Other status indicia could be used to monitor progress of the surgery. One way to do that would be to have the cell representing the time the patient is in the operating room changed progressively as the surgery proceeds toward completion. For example, initially the cell can be changed so that one-quarter of it along its time length is in a contrasting color or distinctive pattern (FIG. 1A) to indicate that step 1 has been completed. Another way would be to use alphanumerics, such as "Step 1" in a column occupying the first quarter of the scheduling indicator cell (FIG. 1C). If the label is used to signify entry of the patient, the first column within the cell would be used to indicate completion of step 1 (FIG. 1C). Status indicia might also take the form of a clock face, part of which is shaded or colored as the procedure progresses or as time passes (FIG 1E). Moreover, a combination of such indicia could also be used.

When a second milestone or significant stage has been reached, a second status indicator could be displayed. As an example, a second column, ½ the width of the cell, could be changed to a contrasting color (FIG. ID). Additional indicia, for example, additional columns within the cell, could be used to represent other milestones or significant stages during the surgery.

The method of the instant invention, when a real-time clock is incorporated, can be made to display status indicia automatically. To illustrate, "Case abc" (FIG. 1) might involve four major stages. Assume that stage 1 is expected to take twenty minutes, stage 2 thirty minutes, stage 3 forty minutes and stage 4 fifteen minutes. Means, for example, a signal button, can be provided in the operating room to indicate when each stage has been completed. If that button is depressed on or before 7:20 a.m., a status indicator in the form of a vertical bar within cell "Case abc" and occupying ¼ of that cell, can be made to appear (FIG. 1A). However, if the real-time clock reaches 7:21 before the signal button is depressed, that status indicator can be made automatically to begin flashing and to continue flashing until the indicator button is depressed. Such flashing of a status indicator can alert the operator to the fact that the procedure is taking longer than anticipated. With such information in hand, the need for rescheduling can be anticipated before the situation becomes critical.

The real-time clock could also be used for automatic display of conflict indicia. If the signal button in Rm 3 has not been used to signify that "Doc a" has completed his task before 7:45 , a conflict indicator can be made to

appear because Doc a is scheduled to be in Rm 1 working on Case abc at that time.

Status indicia may, but need not be communicated according to a predetermined sequence. In some procedures sequencing may not be important with respect to some or all of the stages of the procedure. When sequencing is imperative, the method and system of the present invention can be made to operate in a programmed mode. Each time a milestone is reached, all that the operator need do is depress a button. Each button press signals the reaching of the next milestone in a predetermined sequence.

In other applications, however, a manual mode might be more suitable. In the manual mode, the operator, by movement of the cursor or some other mechanism, first identifies the stage or milestone and then signals its completion. Thus, the operator could, in the manual mode, signal completion of stage 3 before stage 2.

Hybrids of the two modes may also be employed. Thus, even in the manual mode, predetermined sequences or rules may be established. For example, it may be necessary that step 3 be completed before step 4 is begun, but steps 1, 2 and 5 may proceed without regard to the timing of steps 3 and 4. Conflict indicia can be made to signal the violation of any sequence rules.

As can be appreciated, many installations are likely to want the flexibility of selecting either the programmed mode, the manual mode or the hybrid mode. The present invention readily accommodates such flexibility.

Frequently it is important that a record be kept of what happened and when. This can be accomplished according to the instant invention simply by recording (e.g. in the memory or on a printout) the time when each milestone is reached. Normally, a real time record, using the real-time clock, would be made each time a milestone signal is sent. However, often, contemporoueous signalling is impossible. For example, during surgery, no one may be free to depress the signal button at the time a milestone is reached. Therefore, the present invention also contemplates means for manual entry of the time when an event occurred. It also contemplates use of appropriate indicia, usually on the historical record, of whether the time recorded was real-time or was manually entered.

The historical record also provides for accountability. From that record it can readily be determined what sequence was followed, when each milestone was reached and which resources were involved. to reschedule the resources involved in the second tier conflict and only if no conflicts result from that second rescheduling, to proceed to reschedule at both the first and second tiers. Otherwise, the rule would require abandoning the effort to reschedule.

The instant invention also contemplates the use of status indicia to predict unanticipated availability of resources. For example, if stage 2 in "Case abc," not expected to be finished until 7:50, has been completed before 7:40, the status indicator bar (FIG. 1A) can be displayed in a different contrasting color. The appearance of such a color bar on the display would alert the operator to anticipate availability of operating room 1 (and the other resources involved in "Case abc") earlier than originally expected.

FIG. 2 represents a dynamic display of information based on real-time information, as contrasted with the static prospective information that is reflected in FIG 1. On FIG. 2, the time now is indicated by "(tn)" and an arrow.

FIG. 2 shows a conflict between "Case abc" and "Case def" for surgical operating room 1, as denoted by conflict indicator C-1. This conflict could have arisen as a result of the operator, reacting to status indicia, revising the anticipated completion time of "Case abc." Alternatively, it may have been triggered by the passage of time (as indicated by the real-time clock) beyond 8:45 without a signal having been received that "Case abc" has been completed.

It should be noted that the revision of the scheduled completion of "Case abc" also causes a conflict in the schedule of "Doc a" who is supposed to be in "Rm 4" at 9:00. Conflict indicator C-2 reflects that conflict.

The system can also be made to take certain actions automatically. For example, if a piece of equipment must be warmed up for a predetermined period of time before use, the method of the instant invention would encompass having the system energize that piece of equipment when a particular milestone in the procedure has been completed. Similarly, in an industrial setting, the system could automatically cut purchase orders or open molds when certain predetermined milestones are reached.

The method of this invention also contemplates a rule based system wherein the detection of certain conflict indicia would cause automatic rescheduling of some resources. To illustrate, assume that in FIG. 1, there must be 15 minutes between completing Case abc and beginning Case def. If a signal has not been sent by 8:50 that Case abc is over, a rule could be established that would automatically reschedule Case def to begin at 9:15. The rule could also require checking the schedules of all the resources involved in Case def before rescheduling.

If, upon checking those Case def-related schedules no new conflicts are detected, the rescheduling would be done and notice of the change communicated automatically to the people affected. This could be done, for example, by having the system call the office of the surgeon scheduled to do Case def and, by use of a voice synthesizer, report the new schedule.

If the rescheduling of Case def is found to provoke other conflicts, the system could be designed so as not to do the rescheduling, but instead merely to give notice of the first conflict. That notice could be by means of a visual display, by the sounding of a distinctive note or the like. Another possibility would be to have the system try:

Ideally, conflict indicia would be displayed regardless of which resource or resources are involved. For example, even if the unexpected delay in completing "Case abc" did not cause a conflict in use of Room 1, it may have caused a conflict in the schedule of the anaesthesiologist involved in that case. If the anaesthesiologist's schedule had been placed in the data base, a search of the data base in response to rescheduling of the completion of "Case abc" would reveal that the anaesthesiologist's extended involvement in "Case abc" conflicts with his other obligations. As a result, yet another conflict indicator C-3 would be displayed. Conflict indicator C-3 could be non-specific, in that it would merely reflect the existence of a conflict but not identify the source. Conflict indicia C 1 and C 2, on the other hand signify not only the existence of a conflict but also identify one or more of the resources involved. Alternatively, C-3 could be made specific by use of color, position, shape etc.

It should be noted that identifiers "Case abc" and "Case ghi" under rooms 1 and 2 have been moved from within the cells to above them to indicate that those cases are currently proceeding in their respective operating rooms. The identifier "Case abc" under "Doc a" has also been moved to above the cell to reflect that Doc a is currently involved in that case.

Under Rm. 1 on FIG. 2, it can be seen that the scheduled completion time has been changed from 8:45 to 9:15, representing a delay (d) of 30 minutes. The cross-hatching under Rm. 1 shows that Case def, originally scheduled to begin at 9:00, will not begin until 9:30.

The locations of the identifiers under Rm. 3 immediately reveal that Cases klm, mno and prs have been completed and that Case tuv has not yet begun. It can also be seen that Case mno was originally scheduled to end at 8:15 but did not actually end until 8:30.

Still on FIG. 2, under "Doc. a", it can be seen that his involvement in Case abc did not end at 8:15 as planned, but is still in progress at the current time and is now scheduled to end at 9:15.

Finally, it can be seen that Mic. X, initially scheduled to be moved into Rm. 1 at 8:45, perhaps to permit set-up and calibration in advance of Case def, has not yet been moved in, and is not scheduled for that move until 9:15.

FIG. 3 is an historical display of how the primary resources were actually used relative to the schedule shown in FIG. 1. In FIG. 3, it can be seen that "Case abc" which had been planned to be completed at 08:45 (dashed line in "Case abc" cell), was not completed until about 09:05 and "Case def" started immediately thereafter. Conflict indicator C-4 (double cross-hatching) shows that "Case def" did not begin at the time anticipated. Similarly, conflict indicia show that "Doc a" did not begin the procedure in Rm 4 until 9:05 (C-5) because he was delayed by Case abc.

In the embodiment of FIG. 3, indicia in the form of single cross-hatching, are used to show changes that were made from the prospective schedule. The opposite direction cross-hatching of the Case tuv cell denotes a cancelled procedure.

It should be noted that neither FIG. 1 nor FIG. 3 shows a current time indicator. In order to keep the two types of displays from being confused, some notation would normally be used to differentiate one from the other. One such method would be to use one background color for prospective displays and a contrasting background color for historical displays. Such use of contrasting colors could also make superflous a separate current time flag. On the dynamic display, the passage of time could be shown by having the interface line between the two colors move inexorably downward.

The display of FIG. 2 contemplates showing time passing by having the time arrow (tn) move down the screen, with the cells remain stationary. As those skilled in the art will readily appreciate, the time line can be held stationary while the cells move. One such display is reflected on the left half of FIG. 4. As time passes, the digital clock changes and the cells index upwardly.

FIG. 4 also shows how, in accordance with the instant invention, a graphical display may be combined with and supplemented by a real time textual display. As one cell passes off the screen, the textual display showing current utilization of that resource would automatically change to reflect the new circumstance.

FIG. 4 shows the situation at 8:05. FIG. 5 shows the situation with respect to the same operating rooms at 11:25. It should be noted that the time relationships between cells have changed between 8:05 (FIG. 4) and 11:25 (FIG. 5). This has occurred because embedded in the cells in this embodiment are milestone markers (M). The cells stop at each of these milestone markers until indication is received that the milestone has in fact been reached. The cell then resumes indexing upwardly. In this embodiment, the combination of milestone markers and cell movements constitute the status indicia.

FIG. 6 shows a display of a prospective schedule for the beginning of the month of June 1987 for Projects X and Y and Resources 123, 223 and 224. Project X has two phases which can be partially overlapping. Project Y has three phases none of which can overlap. Resources 123, and 223 are used in phases 1 and 2 of Project Y. Resource 224 is used twice during phase 1 of Project X and in phase 3 of Project Y.

FIG. 7 shows the dynamic or actual events as of June 8, 1987 with respect to the schedule shown in FIG. 6. Phase of Project X did not begin on time and ended late. The late ending is indicated by arrow t in the "phase one" cell. That delay has caused a conflict to arise because Resource 224 cannot be used concurrently in phase 1 of Project X and phase 3 of Project Y. This conflict is indicated by indicia C-6, C-7 and C-8. The time is indicated by a screen background color change. The interface between the two colors is the current time (t).

Although Project X and Resource 224 used in Project X have been rescheduled on FIG. 7, Project Y phase three and the use of Resource 224 in "Y" three have not yet been rescheduled.

While some overlap between phases one and two of Project X was anticipated, the delay in completion of phase one resulted in too great an overlap, and the start of phase two had to be delayed as a result. This is indicated by shading in the Project X, phase two cell.

FIG. 8 shows a display relating to FIG. 1 which has been reconfigured to include additional information about some of the cells.

As discussed above, the method and system of the instant invention may be menu driven. The nature of the menus and submenus, the information to which they permit access and the other functions they make available will vary depending upon the application. Some menus can be used merely to call up information from the data base. Other menus can be used to modify the display format. How such menus can be used and the kinds of menus which can be made available are as varied as the applications to which the invention may be applied and the creativity of those who use the invention.

The conventional use of pop up windows allows additional information to be displayed beyond that which can conveniently be placed on a graphical display. In FIG. 9 a pop up window has been called up in order to view detailed information concerning a particular case.

The display can also be used to trace the location of a specific physician or patient. The data base in a hospital system could also allow the display of the availability of other resources, unrelated to the surgical suite. For example, a hospital system could be designed to identify the present and future occupants of rooms so that individuals could be easily located and timely information retrieved as to availability of rooms.

Although it is anticipated that, at least in the early applications of the instant invention, inputting of information will normally be through key boards and/or

signal switches, it should be understood that the invention is not limited to use of such devices. Depending upon the particular application, telephone, radio, microwave, infrared and other devices and methods of transmitting signals could be used. In an industrial setting where dynamic scheduling depends upon personnel in the field arriving and departing from a myriad of different locations, telephones or "beepers" could be used to input current information. Similarly, conflict indicia or rescheduling information could automatically be communicated to field personnel by means of "beepers" or other such devices.

While it is believed that a cathode ray tube display is most suitable for use in practicing the instant invention, the term "display" has been used herein much more generically. Depending upon the particular application, hard copy, e.g., a paper print-out, might be an acceptable display. Similarly, an array of incandescent bulbs might be adequate. Other, more or less sophisticated displays could also be employed.

Finally, the above-described embodiments of the invention are intended to be illustrative only. Numerous alternative embodiments may be devised by those skilled in the art without departing from the spirit and the scope of the following claims.

I claim:

1. A method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

identifying some of said resources as being primary, and other resources as being secondary;

establishing temporal relationships between at least some of said resources;

creating a data base of information about at least one of said resources, at least some of which information is independent of said temporal relationships between resources;

prospectively scheduling utilization of at least some of said primary resources and at least some of said secondary resources;

displaying, in graphical fashion, the prospectively scheduled utilization of at least some of said resources;

determining whether any of said scheduled utilizations of one of said resources is incompatible with any of the information in said data base; and

communicating, by means of conflict indicia, the existence of any said incompatible scheduled utilizations.

2. The method of claim 1 wherein said display is a transient optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

3. The method of claim 2 further comprising the step of displaying status indicia.

4. The method of claim 2 wherein at least two different types of conflict indicia are displayed.

5. The method of claim 4 wherein one of said types of conflict indicia identifies a temporal conflict and another conflict indicia identifies an impermissible use as determined by a search of said data base.

6. The method of claim 4 wherein at least some of said conflict indicia identify the type of conflict involved.

7. The method of claim 2 further comprising the steps of displaying utilization information about at least some primary resources;

displaying utilization information about at least some of said secondary resources; and

displaying a relationship between at least one of said primary resources to at least one of said secondary resources.

8. The method of claim 2 wherein there is displayed simultaneously at least one primary resource and at least one secondary resource.

9. The method of claim 2 wherein the display of information is dynamic in that it reflects status information in real time.

10. The method of claim 2 wherein at least one of said conflict indicia identifies a real conflict and at least one other of said conflict indicia identifies an apparent conflict.

11. The method of claim 2 wherein said data base can be interrogated to cause a display of information about at least one of said resources.

12. The method of claim 1 further comprising the steps of:

obtaining information representing actual utilization of at least one of said resources at a point in time subsequent to the first scheduled utilization of said resource;

determining whether said actual utilization is incompatible with any of said temporal relationships or with any information stored in said data base; and

communicating, by means of conflict indicia, the existence of any such incompatible utilizations.

13. The method of claim 1 further comprising the step of determining whether any of said scheduled utilizations is incompatible with any of said temporal relationships.

14. The method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

creating a data base of information about at least some of said resources, at least some of which data is independent of temporal relationships between resources;

including in said data base permissible and impermissible uses of at least some of said resources;

prospectively scheduling utilization of at least some of said resources;

displaying, in graphical fashion, the prospectively scheduled utilization of at least some of said resources;

searching said data base to determine if any of said scheduled utilizations constitutes an impermissible use; and

communicating, by means of conflict indicia, said impermissible scheduled utilizations.

15. The method of claim 1 or 14 wherein communication of at least some of said conflict indicia is by means of sound.

16. The method of claim 1 or 14 wherein communication of at least some of said conflict indicia is by means of light, radio waves or other electromagnetic radiation.

17. The method of claim 14 wherein said display is a transient optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

18. The method of claim 17 wherein said prospectively scheduled utilization is reflected on said display in the form of scheduling indicia.

19. The method of claim 18 further comprising the steps of:

obtaining information representing actual utilization of at least one of said resources at a point in time

subsequent to the first scheduled utilization of said resource;

communicating said actual utilization information by having same appear on said display in the form of status indicia.

20. The method of claim **19** further comprising the steps of:

determining whether said actual utilization is inconsistent with any prior scheduled utilizations of any resource;

rescheduling at least one of said inconsistent previously scheduled utilizations.

21. The method of claim **19** further comprising the step of recording said actual utilizations.

22. The method of claim **14** further comprising the step of communicating at least two different types of conflict indicia.

23. The method of claim **22** wherein one of said conflict indicia identifies a temporal conflict and another of said conflict indicia identifies an impermissible use as determined by a search of said data base.

24. The method of claim **14** wherein said data base is comprised of a permanent or semi-permanent data base and a transitory data base.

25. A system for prospectively planning utilization of a multiplicity of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory containing information about at least some of said resources, at least some of which information is independent of temporal relationships between resources;

a set designated as primary resources and a set designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

display means for displaying in graphical form, the prospectively scheduled utilization of at least some of said resources;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base, to detect incompatibilities; and

means for communicating, by use of conflict indicia, the existence of detected incompatibilities.

26. The system of claim **25** wherein said display means are characterized by being transient.

27. The system of claim **26** wherein at least some of said scheduling information is made to appear in textual form on said display.

28. The system of claim **27** wherein at least some of said conflict indicia are made to appear on said display.

29. The system of claim **28** wherein said scheduling information reflects planned utilization of at least some of said primary resources as a function of time.

30. The system of claim **29** wherein at least some of said scheduling information incorporates information about utilization of at least some of said secondary resources.

31. The system of claim **28** wherein at least some of said conflict indicia appear on said graphical display.

32. The system of claim **25** wherein at least some of said conflict indicia appear on said graphical display.

33. The system of claim **25** wherein at least two different kinds of conflict indicia are employed to communicate the existence of at least two different kinds of incompatibilities.

34. The system of claim **33** wherein at least one of said conflict indicia identifies a temporal incompatibility and at least one other conflict indicia identifies an incompatibility as determined by a search of said data base.

35. A system for prospectively scheduling, periodic monitoring and managing utilization of a plurality of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory, containing information about at least some of said resources; at least some of which information is independent of temporal relationships between resources;

a set designated as primary resources and a set designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

display means for displaying in graphical form, the prospectively scheduled utilization of at least some of said resources;

means for communicating at least some of said prospectively scheduled utilization information through use of graphically displayed scheduling indicia;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base to detect incompatibilities;

means for communicating, by use of conflict indicia, the existence of detected incompatibilities;

means for collecting information about actual utilization of at least one of said primary resources subsequent to the first scheduled use of a resource; and

means for modifying at least one of said scheduled utilizations to reflect variances between said actual utilization and said prospectively scheduled utilization.

36. The system of claim **35** further comprising means for inputting the actual status of utilization of at least one of said primary resources at a point in time subsequent to the initial planned utilization of at least one of said primary resources.

37. The system of claim **36** further comprising means for collecting information about actual utilization of at least one of said primary resources at a point in time subsequent to the first prospectively scheduled utilization thereof and means for communicating said actual utilization information by use of status indicia.

38. The system of claim **37** further comprising means for comparing said actual utilization of at least one of said primary resources with the prospectively scheduled utilization of said resource and means for communicating, through use of status indicia, the results of said comparison.

39. The system of claim **37** wherein said means for collecting information about actual utilization of resources includes real time clock means.

40. The system of claim **37** wherein said display means includes means for displaying at least one of said conflict indicia or said status indicia.

41. The system of claim **37** further comprising means for dynamically displaying, by use of said status indicia, the status of utilization of at least one of said resources in real time.

42. The system of claim **36** wherein said means for inputting said actual utilization status of resources includes real time clock means.

43. The system of claim 36 further comprising means for recording the time of said inputting of said actual status utilization data.

44. The system of claim 36 further comprising means for recording the time of said actual status utilization.

45. The system of claim 25 or claim 35 wherein said data base is comprised of a semi-permanent data base and a transitory data base.

46. The system of claim 35 wherein said means for collecting said actual utilization information includes real-time clock means.

47. The system of claim 46, 41, or 39 wherein said real time clock means is made to appear concurrently with said graphical display of the prospectively scheduled utilization of at least some of said resources.

48. The system of claim 35 further comprising means for detecting modification-caused incompatible utilizations and communicating said detected modification-caused incompatibilities by use of conflict indicia.

49. The system of claim 48 wherein said display means includes means for displaying at least one of said conflict indicia or said status indicia.

50. The system of claim 35 wherein said display means are characterized by being transient in nature.

51. The system of claim 35 wherein said modifying means includes means for automatically altering at least one of said scheduled utilizations in response to detection of at least one modification-caused incompatibility.

52. The system of claim 35 wherein at least some of said actual utilization information appears on said graphical display.

53. The system of claim 32, 31 or 52 wherein said graphical display is made to appear concurrently with a textual display of information about utilization of at least some of said primary or secondary resources.

54. The system of claim 26 wherein information stored in said data base about at least one of said resources can be accessed and made to appear on said display.

55. The system of claim 35 wherein at least one of said conflict indicia is communicated by graphical display thereof.

56. The system of claim 26 or 55 further comprising

means for displaying utilization information about at least some of said primary resources;

means for displaying utilization information about at least some of said secondary resources; and

means for displaying a relationship between at least one of said primary resources and at least one of said secondary resources.

57. The system of claim 26 or 55 further comprising means for simultaneously displaying information about at least one primary resource and at least one secondary resource.

58. The system of claim 26 or 55 further comprising means for dynamically displaying on said transient display, status information about the utilization of at least some of said resources in real time.

59. The system of claim 26 or 55 wherein at least one of said conflict indicia identifies a real conflict and at least one other conflict indicia identifies an apparent conflict.

60. The system of claim 26 or 55 further comprising means for interrogating said data base to cause a display of information about one of said resources.

61. The system of claims 26 and 55 wherein at least two different kinds of incompatibilities can be detected and wherein at least some of said conflict indicia identify the nature of the incompatibility associated therewith.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

SHEET 9 OF 9

Figure 9, "Pulmonary Emphysemia" should read --Pulmonary Emphysema--.

COLUMN 2

Line 31, "such." should read --such--.

COLUMN 4

Line 7, "an" should read --a--.
Line 57, "semi permanent" should read --semi-permanent--.

COLUMN 5

Line 12, "on audible" should read --an audible--.
Line 13, "schedule" should read --scheduled--.

COLUMN 6

Line 9, ""Status indicia."" should read --"status indicia."--.
Line 45, "anaesthesiologist's." should read --anaesthesiologists.--.

COLUMN 7

Line 41, ""construction" "sabatical"" should read --"construction", "sabbatical"--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN 8

Line 34, "resource s" should read --resource's--.
Line 37, "menu driven." should read --menu-driven.--.
Line 68, "the the" should read --the--.

COLUMN 9

Line 7, "9:00" should read --09:00--.
Line 8, "09:,30." should read --09:30.--.
Line 64, "two dimensional" should read
--two-dimensional--.

COLUMN 11

Line 36, "contemporoue-" should read --contemporane---.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN 11

Line 48, "involved to" should read

--involved.

The system can also be made to take certain actions automatically. For example, if a piece of equipment must be warmed up for a predetermined period of time before use, the method of the instant invention would encompass having the system energize that piece of equipment when a particular milestone in the procedure has been completed. Similarly, in an industrial setting, the system could automatically cut purchase orders or open molds when certain predetermined milestones are reached.

The method of this invention also contemplates a rule based system wherein the detection of certain conflict indicia would cause automatic rescheduling of some resources. To illustrate, assume that in FIG. 1, there must be 15 minutes between completing Case abc and beginning Case def. If a signal has not been sent by 8:50 that Case abc is over, a rule could be established that would automatically reschedule Case def to begin at 9:15. The rule could also require checking the schedules of all the resources involved in Case def before rescheduling.

If, upon checking those Case def-related schedules no new conflicts are detected, the rescheduling would be done and notice of the change communicated automatically to the people affected. This could be done, for example, by having the system call the office of the surgeon scheduled to do Case def and, by use of a voice synthesizer, report the new schedule.

If the rescheduling of Case def is found to provoke other conflicts, the system could be designed so as not to do the rescheduling, but instead merely to give notice of the first conflict. That notice could be by means of a visual display, by the sounding of a distinctive note or the like. Another possibility would be to have the system try to--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743
DATED : June 26, 1990
INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN 12

Lines 14-48, lines 14 to 48 should be deleted.

COLUMN 14

Line 19, "Phase of" should read --Phase 1 of--.
Line 52, "pop up" should read --pop-up--.
Line 55, "pop up" should read --pop-up--.

COLUMN 15

Line 26, "I claim:" should read --We claim:--.

COLUMN 17

Line 2, "resource;" should read --resource; and--.
Line 10, "resource;" should read --resource; and--.
Line 52, "claim 27" should read --claim 26--.

Signed and Sealed this

Thirty-first Day of March, 1992

Attest:

HARRY F. MANBECK, JR.

Attesting Officer *Commissioner of Patents and Trademarks*

PATENT APPLICATION SERIAL NO. 096027

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

050	09/18/87	096027	1	201	170.00 CK
050	09/18/87	096027	1	202	17.00 CK
050	09/18/87	096027	1	204	120.00 CK
050	09/18/87	096027	1	205	110.00 CK

S 20360 10/07/87 096027 06-1205 020 205 55.00CR

PTO-1556
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ABSTRACT OF THE DISCLOSURE

The invention relates to the method for the prospective scheduling, periodic monitoring and dynamic management of a plurality of interrelated and interdependent resources using a computer system. The method includes providing a data base containing information about the resources and graphically displaying utilization and availability of the resources as a function of time. Indicia can be made to appear on the display to provide visual identification of symbols as well as information about scheduling, status and conflicts involving the resources. In addition, access to the data base can be made available to provide a continuous update of the display so that the display of the resources is for the most recent data in the data base. Access to the data base can also permit the operatior to call up a wide variety of information about the resources and can also be used to track events and procedures.

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METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

Field of Invention

The invention relates to a method for managing resources and particularly to the method and system for the prospective scheduling and real time dynamic management of a plurality of interdependent and interrelated resources using a computer system for communicating information.

Background of the Invention

Many different fields require the management of resources in order to carry out programs and schedule activities effectively and efficiently. For example, the construction of a building requires scheduling the use of general and specialized personnel, of particular pieces of equipment and of delivery vehicles. In addition, a number of these resources may have to be shared with other construction projects at other sites. It also involves managing the rescheduling of the use of those resources as time passes and events unfold, often not in accordance with the original schedule.

Similarly, the efficient and effective use of surgical operating rooms in a hospital requires coordinating the use of numerous different resources, usually requiring collecting and gaining access to and then making use of information derived from many different sources. Some of the resources which must be managed and coordinated in a surgical suite or wing include the operating rooms, the surgeons, the anaesthesiologists, the residents, the nurses, the technicians, specialized pieces of equipment and the like.

In the last decade, there has been a significant increase in the use of computers and computer display systems for accessing and displaying data. For example, U.S. Patent No. 3,725,650 discloses a method and arrangement for visually representing industrial management data. This patent teaches the use of a computer display for representing data in the form of bar-graphs or pie-graphs. The displays are for past and real time data and do not include projections into the future. In addition, each graph is independent of each other graph so that the impact of a change in one will not affect another. There is no suggestion in this patent that the method therein disclosed could be used for prospective or dynamic management of the utilization of resources.

U.S. Patent No. 4,646,238 relates to a computerized system for planning the testing and grading of products as part of a manufacturing process. This patent does not disclose any system for prospectively scheduling the utilization of resources, nor does it disclose any method for monitoring actual utilization of resources, nor does it disclose a system where scheduling conflicts are noted.

U.S. Patent No. 4,547,851 relates to interactive communications systems used in restaurants for processing

food orders by patrons and for making entertainment, like video games available to patrons. It does not relate to resource scheduling, either prospectively or dynamically.

U.S. Patent No. 4,591,983 discloses a hierarchical knowledge system and does not appear to pertain at all to scheduling of interrelated and interdependent resources.

U.S. Patent No. 4,336,589 discloses a method and system for monitoring and controlling the flow of articles in a warehouse. It is designed primarily to keep track of orders and of the articles ordered as they are taken from stock and prepared for shipment. There is no suggestion that such a system could be used for resource scheduling, management or monitoring.

Project planners which employ computers are also well known. Such project planners most commonly are task or activity focused. They are designed primarily for sequential scheduling of related tasks. For example, if a construction project must proceed through six phases, and phase 2 cannot begin until phase 1 is 2/3 complete, and phases 3, 4 and 6 each must await completion of the preceding phase, but phase 5 can begin simultaneously with phase 4, a project planner could be used to set up the schedule at the outset and to adjust that schedule to reflect slippages as they occur. Project planners, however, are not well equipped to manage the resources employed in the various activities or to alert the operators to the need to adjust the scheduled activities in response to other demands upon those resources.

The management of resources, utilization of which can change in time and can have complex interrelationships, can present serious problems to effective scheduling of the use of those resources and the tasks or activities in

which they are employed. Inefficient and particularly incompatible solutions to these problems can be very costly in a manufacturing setting, in the construction of a building and elsewhere. Inappropriate solutions to such problems become far more serious when they involve medical facilities and the performance of surgery because they can then present life and death issues.

What is needed is an effective display of at least some of the available resources as a function of time associated with a data base of information relating to displayed resources and perhaps to others as well. In addition, such a system should, most advantageously, be capable of being accessed in order to produce additional displays relating to additional resources. In one of its more general forms, such a system should permit changing the time scale to accommodate widely diverse applications. Most desirably, it should also be able to display short range as well as long range projected (and/or historical) utilization without distorting relationships between displayed data when going from short to long range or vice versa.

Additionally, and, in some settings, most importantly, the system should be capable of showing interrelationships between resources so that changes in utilization of one or more resources, reveal the impact of those changes upon the availability and utilization of other resources as well as upon anticipated future utilization of the same resource and upon the activities in which they are employed.

Summary of the Invention

The invention relates to a method for the dynamic management of a plurality of resources, preferably using a

computer system. The method includes providing a data base that includes information about the available resources and graphically displaying anticipated and/or actual utilization of the resources as a function of time. Generally, the displays can be in the form of bar graphs, pie charts, line graphs or other geometric shapes. Various types of indicia may be employed to provide visual auditory or other sensory communication of information pertinent to the resources and/or the utilization thereof. "Scheduling indicia" may be used to indicate utilization (historical and/or prospective) of resources, "status indicia" may be employed to reflect current status of events and "conflict indicia" may be used to alert operators to scheduling conflicts. In one of its preferred configurations, the invention contemplates providing access to a data base to permit continuous updating of the information stored therein so that when resource utilization is displayed it reflects the most recent data in the data base.

In another embodiment, the method and system of this invention gives access to the data base in order to provide information, beyond that appearing on the display, relative to a selected resource. Provision can also be made for selectively changing the display in order to present data relating to different aspects of one or more resources.

Further, the invention contemplates the automatic adjustment of schedules as conflicts arise as well as the automatic communication of those adjustments. It also contemplates automatic notification to relevant personnel and automatic initiation of activities (cutting a purchase order, turning on a furnace etc.) and procedures upon reaching certain milestone points.

The system can also incorporate accountability means whereby it can be determined whether resources are being used properly and procedures are being followed in accordance with established rules. In addition, a record keeping function can be incorporated to document what resources were used, for what procedures, by whom and when.

Of course, not every application of this invention will necessarily incorporate all of the above features. It is anticipated that some applications will have need for only some of the features and other, more complex or more sophisticated or more automated applications will make use of more of the features contemplated by the instant invention.

Brief Description of the Drawings

A description of the invention will be given in connection with the drawings which include:

Fig. 1 shows a prospective display of scheduled resources in accordance with the invention.

Fig. 1A shows one of the cells from Fig. 1 after the first milestone has been completed.

Fig. 1B shows one of the cells of Fig. 1 with the identifying label having been moved to above the cell to denote that the patient is in the room.

Fig. 1C shows the same information as in Fig. 1A, but using a different means to indicate completion of milestone 1.

Fig. 1D shows the same cell as Fig. 1A, but at a later point in time, after the second milestone has been passed.

Fig. 1E shows a cell in which a circle or clock face is used to display status indicia.

Fig. 2 shows the schedule of Fig. 1 as a dynamic display, modified in accordance with the present invention by events as they have occurred.

Fig. 3 shows the schedule of Fig. 1 after completion. It is an historical record generated in accordance with the present invention, showing not only what took place, but also how reality varied from projected utilization.

Fig. 4 shows an alternative method for graphically displaying scheduling information while simultaneously displaying in textual form, information about the scheduled resources.

Fig. 5 shows the display of Fig. 4 at a later point in time.

Fig. 6 shows a display of a prospective schedule of industrial projects in accordance with the invention.

Fig. 7 shows an dynamic display of the schedule of Fig. 6, modified to take into account some events as they have occurred.

Fig. 8 shows a reconfigured display of some of the information appearing on Fig. 1.

Fig. 9 shows a display wherein a pop-up window, overlayed upon the display of Fig. 1, shows information about case klm.

Discussion of the Invention

The method according to the invention enables dynamic control of a complex project involving a plurality of resources which are interrelated and which can change with time. Preferably, the method utilizes a display system such as the type associated with a personal computer and a keyboard for selectively changing the display. In addition, a data base containing data relating to the resources can be made available. The data base can be updated from one or more real time sources and this in return can result in an update of the data being displayed. The keyboard can also be used to input data to the data base and to do prospective scheduling. The data preferably is displayed graphically as a function of time to portray the temporal relationships between various resources, activities and events.

Inputting, modifying, handling and accessing of the data can be carried out using known methods and techniques. Similarly, generating appropriate graphical displays can be done by using well known techniques.

There are numerous situations which can effectively be managed by the use of the instant invention. One such situation is monitoring and planning the use of the facilities and other resources available in the surgical suite of a hospital. Each operating room represents a resource and information can be provided in the data base about each operating room. For example, some operating rooms may be limited to ambulatory procedures, some may be specifically designed and equipped for open heart surgery, some may require only 15 minutes for clean up between procedures and others might need 20 minutes. Some specialized pieces of equipment may be limited to use in only some of the operating rooms. Some equipment may

require long periods of sterilization between procedures, while others require none. Also, some resources may be unavailable because of construction, repair or maintenance activities. If the particular application calls for a rule-based system (as will be discussed below), the applicable rules would normally be in the knowledge or data base. Preferably, all such information would be included in a primary or semi-permanent data base.

The primary data base could also include standard information about certain known activities or procedures. For example, it may include information like: an appendectomy should be scheduled to take 90 minutes, requires that medications A, B, C and D be available, that only operating rooms X, Y and Z are suitable for such a procedure and that only doctors J, K and L are authorized to perform such operations.

A supplemental, or transitory data base, preferably integrated with the primary data base, can also be employed to store information more frequently changed than the information in the primary data base. The transitory data base could include information about the planned utilization of a given resource on a particular day or at a particular time. Tasks or procedures waiting to be scheduled could also be in the transitory data base. It could also include relevant information about a particular patient (e.g., name, doctor, procedure to be performed, allergies) who is scheduled for surgery. If anything in the planned utilization is incompatible with information in either the primary or secondary data base, a conflict indicator can be made to appear on the display or on audible signal given. For example, if the procedure is scheduled for a room in which construction is going on, a conflict indicator would be displayed. Similarly, if the patient is allergic to medication that is called for, a

conflict indicator would alert the operator of the system to the problem.

Each surgical operating room has a planned use in time and the intended use may be associated with a particular patient, pieces of equipment and procedure, as well as key personnel who will be involved in performing the operation and the medication to be administered.

Each surgeon also represents a resource and the surgeon's prior commitments may be important for determining the availability of the surgeon for other surgical operations or in case of an emergency. In the same way, a patient can be regarded as a resource and the planned locations and activities of the patient can be displayed so that the patient can easily be located. Similarly, pieces of equipment and key personnel can be treated as resources. All this information would normally be put in the supplemental data base and would then be searched along with the primary data base, each time a resource is scheduled for use and each time a schedule is modified.

As can readily be appreciated, it is not unusual for the actual time taken to complete a particular procedure to vary from the scheduled or anticipated time. If the actual time exceeds the projected time, such information should be readily available in order to determine if alternate arrangements must be made. For example, such a deviation could affect subsequent scheduled use of the operating room. In addition, the extended involvement of the patient, the surgeon, key personnel and particular pieces of equipment could have an impact on other surgical procedures which have been planned for that surgeon, those personnel and those pieces of equipment. It could also affect other procedures that might have been scheduled for that patient.

As used herein, a "resource" in the hospital setting could be a room, a person, a piece of equipment, or the like. In other settings, "resources" could include containers, vehicles, supervisors, workers units of goods, blocks of time, dollars, aircraft, boarding gates, pilots and the like. Some resources may be reusable, others may be subject to depletion, and still others may be renewable. Generally, a resource has a known and/or anticipated availability and can be related to one or more other resources as a function of time or as a function of some other consumption, depletion or saturation. As those skilled in the art will readily appreciate, consumption, depletion, saturation and the like are analogous to time in that each can be used as a measuring yardstick. For example, a work day can be viewed as consisting of 32 fifteen minute blocks of time during which activities can be scheduled and resources used. Similarly, a reservoir of 2000 items may be viewed as consisting of 500 groups of 4, with various activities and resources scheduled for utilization as different groups of 4 are consumed. The term "time," as used herein, should be understood in its broadest sense and not limited to measurements based upon rotations of the earth.

The availability and utilization of resources can be displayed as a function of time by use of "scheduling indicia". Progress of a planned procedure can be monitored and displayed by use of "Status indicia." Incompatible scheduling of resources can be signalled by the displaying of "conflict indicia." Any of the several indicia, scheduling, status or conflict, described herein, can be displayed in a myriad of ways, including color changes, color bars, shadings, alphanumerics and the like, and combinations thereof. The several indicia can also be displayed by the use of highlighting, geometric symbols,

flashing, and/or enhancements such as a brightened frame around data.

While the operator of the system can select certain resources for primary display purposes, the system monitors utilization, not only of the displayed primary resources but also of other or secondary resources which may or may not appear on the display, but which are used in conjunction with the displayed primary resources. To illustrate, the operator may choose to display "operating rooms" as the primary resources. One of those operating rooms, O, however, may require surgeon S, anaesthesiologist A, heart/lung machine H and heart monitor M. Resources S, A, H and M may be referred to as secondary resources. If the procedure scheduled for room O takes longer than expected, the system will display conflicts, not only with respect to the primary resource, operating room O, but also with respect to scheduled utilization of the secondary resources, surgeon S, anaesthesiologist A, heart/lung machine H and monitor M. The system can, of course, be so configured as to suppress one or more of these indicia.

In using the system of the instant invention, the operator collects information from various sources concerning needs or requests for use of the resources. In the context of a hospital surgical suite this might involve requests from surgeons for operating rooms, for pieces of equipment, perhaps for particular staff members and for other physicians, such as anaesthesiologist's. Each surgeon would identify the procedure to be performed, the anticipated time to complete the procedure, patient information and other relevant data. Other information might also be supplied, such as other commitments of involved personnel.

The operator loads this information into the data base in any conventional manner and then proceeds to schedule the various resources. If an attempt is made to set up a schedule that involves apparently inconsistent or incompatible use of a given resource, a conflict indicator would be displayed. Having thus been alerted, the operator would then either revise the proposed schedule or determine whether the conflict is real or only apparent.

To illustrate the difference between real and apparent conflicts, consider the situation of a surgeon employing a new procedure which only a few people have been trained to use. The new and unique aspect of the overall surgery may take only 30 minutes of an anticipated 3 hour surgery. The other steps to be performed, e.g., opening the patient in preparation for the critical procedure, stabilizing the patient on the heart/lung machine and closing the wound after the new procedure has been completed, could be performed by other surgeons. Nevertheless, since the operating room would normally be assigned to the primary surgeon for the entire 3 hour period, the system would display a conflict indicator if that primary surgeon were scheduled elsewhere during any part of those 3 hours. In the real world, however, that surgeon's personal presence might only be required for 30 minutes, thereby allowing him to discharge other duties during the remaining 2-1/2 hours when the operating room is being used in his name.

Recognizing that some conflicts may be real and others only apparent, the system and method of the present invention can be made to recognize different kinds of conflicts, some which it "knows" are irreconcilable, some which it "knows" are susceptible of accommodation and some which it is unable to "recognize" as falling in either category. Each type of conflict could be indicated by its

own unique conflict indicia. With that kind of information displayed, the operator can tell whether to reschedule resources immediately or whether to check further to see if a real conflict exits.

After collecting and usually, but not necessarily, after loading the relevant information into the data bank, the operator decides which resources are to be "primary" for display purposes and which are to be "secondary". In the hospital setting the operator may select "operating rooms" for display as the primary resources. Alternatively, "surgeons" or "heart/lung machines" or "CT scanners" or "nuclear magnetic imagers" etc. or some combination thereof might be chosen.

Assume, for illustration purposes, "operating rooms" is selected for display as the primary resources. Initially, the screen will display only the two axes -- time (down the left margin), and operating rooms (across the top as column headings). Although at the outset the remainder of the display would normally be blank, it need not be. For example, for each unscheduled block of time the display can be made to show "open" or some equivalent designation. Also "repair" may be used to reflect that a particular room is not available for scheduling. Designations such as "repair," "construction" "sabatical" could be made to appear automatically as long as the requisite information has been stored in the data base.

The operator would then proceed to prepare a schedule, beginning with "Case abc" for operating room 1. The operator could schedule that case to begin at 7:00 a.m. and to end at 8:45 a.m. Or, if the information as to "Case abc" had already been loaded into the data base, once the starting time had been selected, an automatic search of the data base could cause the system to

calculate and display the end point. In either case, a scheduling indicator would be displayed to reflect utilization of the primary resource, in this instance, "Rm 1". In Fig. 1, the vertical rectangle, labeled "Case abc" is the scheduling indicator. In similar fashion, the remaining operating rooms could be scheduled and scheduling indicia displayed. As long as nothing is planned for one of the primary resources at a particular time, the blank screen or "open" at that location would constitute the scheduling indicator.

During the scheduling of the primary resources, the system can be made to monitor conflicts in utilization involving primary as well as secondary resources. If such conflicts are detected, a conflict indicator will be displayed. The conflict could involve only primary resources, e.g. two procedures scheduled for the same operating room at the same time. In that event, the operator would be able to detect the nature of the conflict on the display. However, the conflict could involve secondary resources, some of which may not appear on the display. In that event, the operator would be alerted to look for the conflict among the secondary resources. Alternatively, by use of color, shading, shape positioning or the like, the conflict indicia itself can identify the secondary resource which is the source of conflict.

On the display, a scheduling indicator showing planned or actual use of a particular primary resource during a given block of time can be referred to as a "cell". On Fig 1 the rectangle showing that "Case abc" is scheduled for Room 1 from 7:00 to 8:45 a.m. would be a "cell". Each cell could be given a title which could be made to appear above the cell or within its confines. Space permitting, a cell could also be made to have several pieces of data relating to secondary resources displayed therein. For

example, within the cell that represents "Case abc" the name of the surgeon or the type of equipment being employed could be displayed.

In the event it is decided to display secondary resources within cells, such secondary resource displays could be used to indicate conflicts. For example, if Doctor S were scheduled simultaneously in two operating rooms, the display of Doctor S as a secondary resource in either or both of those cells could be made to flash. Such flashing would, in that embodiment, constitute the conflict indicia.

The display of secondary resources could also be employed to make additional options available. For example, instead of having to go through a menu, simply by moving the cursor to one of those displayed secondary resources, the system could be made to display a window with that secondary resource's schedule or other information about that secondary resource. Such a window is shown in Fig. 9.

Thus, the system need not be menu-driven. The use of shortcuts, such as displays of secondary resources within cells, may avoid the use of menus. However, in the more complex and/or more sophisticated applications of the instant invention, it is unlikely that sufficient short-cuts can effectively be used so as to avoid all use of menus.

In the displays illustrated in Figs 1 through 3 and 6 through 8, along the Y axis time is shown running from top to bottom, and along the X axis the primary resources are shown. As will readily be understood, which resources to display, and along which axis is a matter of choice and convenience. Similarly, the time intervals can be selected to match the needs of the application. Moreover,

as illustrated in Figs. 4 and 5 those time intervals need not even be displayed.

Turning now to Fig. 1, the display depicts a mixture of resources and their availability in time. The resources are labeled across the top using abbreviations in which "Rm" is room, "Doc" refers to a medical surgeon, "Mic" refers to a particular type of apparatus, namely a microscope and "Res" refers to some other piece of equipment.

The time is shown at the left in Fig. 1, starting with 07:00, based on a 24-hour clock. It is usually most convenient to have all of the primary resources in a display of the same type, such as rooms. However, such uniformity is not essential. As can be seen, the primary resources selected for display in Fig. 1 are of three different types. The primary resources in the first three columns, "Rm 1", "Rm 2", and "Rm 3", are of one type, but the the primary resources of the last three columns, are of two other types. The primary resource of column 4 is a surgeon and the primary resources of columns 5 and 6 are pieces of equipment.

In Fig. 1, "Rm 1" can be taken to refer to a surgical operating room. At 07:00 in the morning "Case abc" is scheduled to occupy "Rm 1" until 08:45. Thereafter, "Case def" will be in "Rm 1" from 9:00 until 09:45.

Rm 2 has "Case ghi" from 07:00 to 09:30. Rm 3 has "Case klm" from 07:00 to 07:15 which is followed by "Case mno" from 07:45 to 08:30. "Case prs" follows from 08:45 to 09:00 and then "Case tuv" from 09:15 to 09:45.

While there may be many surgeons involved, only the activities of the surgeon "Doc a" are shown. "Doc a" will

be in Rm 3 from 7:00 to 7:15, involved in "Case abc" from 7:45 to 8:15 and in Rm 4 (not displayed) from 9:00 to 9:45. "Mic x" will be used by "Doc a" from 7:00 to 7:15, will be used for "Case mno" from 7:45 to 8:15 and will be in room 1 from 8:45 to 9:45. Also, the resource "Res y" will be used for "Case abc" from 7:00 to 7:15 (even though "Case abc" will continue long after 7:15) and will then be moved for use in "Case ghi" (already in progress) from 7:30 to 8:00. Resource "Res y" is then shown as being assigned to "Case def" from 8:15 to 9:30. Although "Case def" is not scheduled to begin until 9:00, keeping "Res y" available for that case from 8:15 does not necessarily represent a conflict, although it may represent a waste of a valuable asset. Depending upon the needs of the particular application, such scheduling of "Res y" could, but need not, trigger the display of a conflict indicator.

In Fig. 1, "Case abc" is scheduled from 7:00 to 8:45. 'Doc a" is scheduled to be involved in that case, but only from 7:45 to 8:15. He is also scheduled for "Rm 3" ("Case klm") from 7:00 to 7:15. If "Case abc" is Doc a's case, then when the operator tried to schedule him for Rm 3 ("Case klm") from 7:00 to 7:15 a conflict indicator would have been displayed. The operator would then have checked, determined that Doc a was needed in Rm 1 ("Case abc") only from 7:45 to 8:15 and then overridden or suppressed the conflict indicator.

The display in Fig. 1 represents the results of a prospective scheduling of activities and has been presented for a predetermined time period. Revising the time scale (from 15 minute to 30 minute intervals, for example) will allow the operator to see further into the future but will result in the size of the scheduling indicia to be physically reduced. The distances between cells under each resource will also shrink so that

resolution of adjacent cases in time may not be discernible. Such shrinking of the time scale will also permit less information, for example, about secondary resources, to be displayed within each cell.

Time scale compression may also trigger conflict indicia. For example, if the scale of Fig. 1 were changed from 15 minute intervals to one hour intervals, conflict indicia would be displayed between several of the cells, including "Case abc" and "Case def" in Rm. 1. Each cell would be occupying a portion of the time block 8:00 to 9:00.

The use of conflict as well as status indicia to communicate data permits communication of multi-dimensional information on a two dimensional display. Some of the data which cause the display of conflict or status indicia may be drawn from the semi-permanent data base, some may be from the transitory data base and some may be from current or real time inputs.

In a hospital surgical wing application, as well as in many other applications to which the instant invention can be put, inclusion of an internal real-time clock would be quite advantageous. For example, such a clock could be used to tell the operator which resources are in use and which ones are available at the time of viewing. It could also enable the viewer to determine where a particular resource, such as "Doc a" is at the present time. In addition, the inclusion of a real-time clock can enable automatic display of conflict indicia.

If timely information is available, status indicia can be used to monitor and display progress of a procedure. The entry of the patient into the operating room could be signalled by use of the identifying label. "Case abc" could be blue before the patient enters, orange as long as

the patient is in the room and red after the patient has left. Alternatively, the label could be moved from within the cell to a site just above it to signify that the patient is in the room (Fig. 1B). Other status indicia could be used to monitor progress of the surgery. One way to do that would be to have the cell representing the time the patient is in the operating room changed progressively as the surgery proceeds toward completion. For example, initially the cell can be changed so that one-quarter of it along its time length is in a contrasting color or distinctive pattern (Fig. 1A) to indicate that step 1 has been completed. Another way would be to use alphanumerics, such as "Step 1" in a column occupying the first quarter of the scheduling indicator cell (Fig. 1C). If the label is used to signify entry of the patient, the first column within the cell would be used to indicate completion of step 1 (Fig. 1C). Status indicia might also take the form of a clock face, part of which is shaded or colored as the procedure progresses or as time passes (Fig. 1E). Moreover, a combination of such indicia could also be used.

When a second milestone or significant stage has been reached, a second status indicator could be displayed. As an example, a second column, 1/4 the width of the cell, could be changed to a contrasting color (Fig. 1D). Additional indicia, for example, additional columns within the cell, could be used to represent other milestones or significant stages during the surgery.

The method of the instant invention, when a real-time clock is incorporated, can be made to display status indicia automatically. To illustrate, "Case abc" (Fig. 1) might involve four major stages. Assume that stage 1 is expected to take twenty minutes, stage 2 thirty minutes, stage 3 forty minutes and stage 4 fifteen minutes. Means,

for example, a signal button, can be provided in the operating room to indicate when each stage has been completed. If that button is depressed on or before 7:20 a.m., a status indicator in the form of a vertical bar within cell "Case abc" and occupying 1/4 of that cell, can be made to appear (Fig. 1A). However, if the real-time clock reaches 7:21 before the signal button is depressed, that status indicator can be made automatically to begin flashing and to continue flashing until the indicator button is depressed. Such flashing of a status indicator can alert the operator to the fact that the procedure is taking longer than anticipated. With such information in hand, the need for rescheduling can be anticipated before the situation becomes critical.

The real-time clock could also be used for automatic display of conflict indicia. If the signal button in Rm 3 has not been used to signify that "Doc a" has completed his task before 7:45, a conflict indicator can be made to appear because Doc a is scheduled to be in Rm 1 working on Case abc at that time.

Status indicia may, but need not be communicated according to a predetermined sequence. In some procedures sequencing may not be important with respect to some or all of the stages of the procedure. When sequencing is imperative, the method and system of the present invention can be made to operate in a programmed mode. Each time a milestone is reached, all that the operator need do is depress a button. Each button press signals the reaching of the next milestone in a predetermined sequence.

In other applications, however, a manual mode might be more suitable. In the manual mode, the operator, by movement of the cursor or some other mechanism, first identifies the stage or milestone and then signals its

completion. Thus, the operator could, in the manual mode, signal completion of stage 3 before stage 2.

Hybrids of the two modes may also be employed. Thus, even in the manual mode, predetermined sequences or rules may be established. For example, it may be necessary that step 3 be completed before step 4 is begun, but steps 1, 2 and 5 may proceed without regard to the timing of steps 3 and 4. Conflict indicia can be made to signal the violation of any sequence rules.

As can be appreciated, many installations are likely to want the flexibility of selecting either the programmed mode, the manual mode or the hybrid mode. The present invention readily accommodates such flexibility.

Frequently it is important that a record be kept of what happened and when. This can be accomplished according to the instant invention simply by recording (e.g. in the memory or on a printout) the time when each milestone is reached. Normally, a real time record, using the real-time clock, would be made each time a milestone signal is sent. However, often, contemporaneous signalling is impossible. For example, during surgery, no one may be free to depress the signal button at the time a milestone is reached. Therefore, the present invention also contemplates means for manual entry of the time when an event occurred. It also contemplates use of appropriate indicia, usually on the historical record, of whether the time recorded was real-time or was manually entered.

The historical record also provides for accountability. From that record it can readily be determined what sequence was followed, when each milestone was reached and which resources were involved.

The system can also be made to take certain actions automatically. For example, if a piece of equipment must be warmed up for a predetermined period of time before use, the method of the instant invention would encompass having the system energize that piece of equipment when a particular milestone in the procedure has been completed. Similarly, in an industrial setting, the system could automatically cut purchase orders or open molds when certain predetermined milestones are reached.

The method of this invention also contemplates a rule-based system wherein the detection of certain conflict indicia would cause automatic rescheduling of some resources. To illustrate, assume that in Fig. 1, there must be 15 minutes between completing Case abc and beginning Case def. If a signal has not been sent by 8:50 that Case abc is over, a rule could be established that would automatically reschedule Case def to begin at 9:15. The rule could also require checking the schedules of all the resources involved in Case def before rescheduling.

If, upon checking those Case def-related schedules no new conflicts are detected, the rescheduling would be done and notice of the change communicated automatically to the people affected. This could be done, for example, by having the system call the office of the surgeon scheduled to do Case def and, by use of a voice synthesizer, report the new schedule.

If the rescheduling of Case def is found to provoke other conflicts, the system could be designed so as not to do the rescheduling, but instead merely to give notice of the first conflict. That notice could be by means of a visual display, by the sounding of a distinctive note or the like. Another possibility would be to have the system try

to reschedule the resources involved in the second tier conflict and only if no conflicts result from that second rescheduling, to proceed to reschedule at both the first and second tiers. Otherwise, the rule would require abandoning the effort to reschedule.

The instant invention also contemplates the use of status indicia to predict unanticipated availability of resources. For example, if stage 2 in "Case abc," not expected to be finished until 7:50, has been completed before 7:40, the status indicator bar (Fig. 1A) can be displayed in a different contrasting color. The appearance of such a color bar on the display would alert the operator to anticipate availability of operating room 1 (and the other resources involved in "Case abc") earlier than originally expected.

Fig. 2 represents a dynamic display of information based on real-time information, as contrasted with the static prospective information that is reflected in Fig 1. On Fig. 2, the time now is indicated by "(tn)" and an arrow.

Fig. 2 shows a conflict between "Case abc" and "Case def" for surgical operating room 1, as denoted by conflict indicator C-1. This conflict could have arisen as a result of the operator, reacting to status indicia, revising the anticipated completion time of "Case abc." Alternatively, it may have been triggered by the passage of time (as indicated by the real-time clock) beyond 8:45 without a signal having been received that "Case abc" has been completed.

It should be noted that the revision of the scheduled completion of "Case abc" also causes a conflict in the schedule of "Doc a" who is supposed to be in "Rm 4" at 9:00. Conflict indicator C-2 reflects that conflict.

Ideally, conflict indicia would be displayed regardless of which resource or resources are involved. For example, even if the unexpected delay in completing "Case abc" did not cause a conflict in use of Room 1, it may have caused a conflict in the schedule of the anaesthesiologist involved in that case. If the anaesthesiologist's schedule had been placed in the data base, a search of the data base in response to rescheduling of the completion of "Case abc" would reveal that the anaesthesiologist's extended involvement in "Case abc" conflicts with his other obligations. As a result, yet another conflict indicator C-3 would be displayed. Conflict indicator C-3 could be non-specific, in that it would merely reflect the existence of a conflict but not identify the source. Conflict indicia C-1 and C-2, on the other hand signify not only the existence of a conflict but also identify one or more of the resources involved. Alternatively, C-3 could be made specific by use of color, position, shape etc.

It should be noted that identifiers "Case abc" and "Case ghi" under rooms 1 and 2 have been moved from within the cells to above them to indicate that those cases are currently proceeding in their respective operating rooms. The identifier "Case abc" under "Doc a" has also been moved to above the cell to reflect that Doc a is currently involved in that case.

Under Rm. 1 on Fig. 2, it can be seen that the scheduled completion time has been changed from 8:45 to 9:15, representing a delay (d) of 30 minutes. The cross-hatching under Rm. 1 shows that Case def, originally scheduled to begin at 9:00, will not begin until 9:30.

The locations of the identifiers under Rm. 3 immediately reveal that Cases klm, mno and prs have been completed and

that Case tuv has not yet begun. It can also be seen that Case mno was originally scheduled to end at 8:15 but did not actually end until 8:30.

Still on Fig. 2, under "Doc. a", it can be seen that his involvement in Case abc did not end at 8:15 as planned, but is still in progress at the current time and is now scheduled to end at 9:15.

Finally, it can be seen that Mic. X, initially scheduled to be moved into Rm. 1 at 8:45, perhaps to permit set-up and calibration in advance of Case def, has not yet been moved in, and is not scheduled for that move until 9:15.

Fig. 3 is an historical display of how the primary resources were actually used relative to the schedule shown in Fig. 1. In Fig. 3, it can be seen that "Case abc" which had been planned to be completed at 08:45 (dashed line in "Case abc" cell), was not completed until about 09:05 and "Case def" started immediately thereafter. Conflict indicator C-4 (double cross-hatching) shows that "Case def" did not begin at the time anticipated. Similarly, conflict indicia show that "Doc a" did not begin the procedure in Rm 4 until 9:05 (C-5) because he was delayed by Case abc.

In the embodiment of Fig. 3, indicia in the form of single cross-hatching, are used to show changes that were made from the prospective schedule. The opposite direction cross-hatching of the Case tuv cell denotes a cancelled procedure.

It should be noted that neither Fig. 1 nor Fig. 3 shows a current time indicator. In order to keep the two types of displays from being confused, some notation would normally be used to differentiate one from the other. One such

method would be to use one background color for prospective displays and a contrasting background color for historical displays. Such use of contrasting colors could also make superflous a separate current time flag. On the dynamic display, the passage of time could be shown by having the interface line between the two colors move inexorably downward.

The display of Fig. 2 contemplates showing time passing by having the time arrow (tn) move down the screen, with the cells remain stationary. As those skilled in the art will readily appreciate, the time line can be held stationary while the cells move. One such display is reflected on the left half of Fig. 4. As time passes, the digital clock changes and the cells index upwardly.

Fig. 4 also shows how, in accordance with the instant invention, a graphical display may be combined with and supplemented by a real time textual display. As one cell passes off the screen, the textual display showing current utilization of that resource would automatically change to reflect the new circumstance.

Fig. 4 shows the situation at 8:05. Fig. 5 shows the situation with respect to the same operating rooms at 11:25. It should be noted that the time relationships between cells have changed between 8:05 (Fig. 4) and 11:25 (Fig. 5). This has occurred because embedded in the cells in this embodiment are milestone markers (M). The cells stop at each of these milestone markers until indication is received that the milestone has in fact been reached. The cell then resumes indexing upwardly. In this embodiment, the combination of milestone markers and cell movements constitute the status indicia.

Fig. 6 shows a display of a prospective schedule for the beginning of the month of June 1987 for Projects X and Y and Resources 123, 223 and 224. Project X has two phases which can be partially overlapping. Project Y has three phases none of which can overlap. Resources 123, and 223 are used in phases 1 and 2 of Project Y. Resource 224 is used twice during phase 1 of Project X and in phase 3 of Project Y.

Fig. 7 shows the dynamic or actual events as of June 8, 1987 with respect to the schedule shown in Fig. 6. Phase 1 of Project X did not begin on time and ended late. The late ending is indicated by arrow t in the "phase one" cell. That delay has caused a conflict to arise because Resource 224 cannot be used concurrently in phase 1 of Project X and phase 3 of Project Y. This conflict is indicated by indicia C-6, C-7 and C-8. The time is indicated by a screen background color change. The interface between the two colors is the current time (t).

Although Project X and Resource 224 used in Project X have been rescheduled on Fig. 7, Project Y phase three and the use of Resource 224 in "Y" three have not yet been rescheduled.

While some overlap between phases one and two of Project X was anticipated, the delay in completion of phase one resulted in too great an overlap, and the start of phase two had to be delayed as a result. This is indicated by shading in the Project X, phase two cell.

Fig. 8 shows a display relating to Fig. 1 which has been reconfigured to include additional information about some of the cells.

As discussed above, the method and system of the instant invention may be menu driven. The nature of the menus and submenus, the information to which they permit access and the other functions they make available will vary depending upon the application. Some menus can be used merely to call up information from the data base. Other menus can be used to modify the display format. How such menus can be used and the kinds of menus which can be made available are as varied as the applications to which the invention may be applied and the creativity of those who use the invention.

The conventional use of pop-up windows allows additional information to be displayed beyond that which can conveniently be placed on a graphical display. In Fig. 9 a pop up window has been called up in order to view detailed information concerning a particular case.

The display can also be used to trace the location of a specific physician or patient. The data base in a hospital system could also allow the display of the availability of other resources, unrelated to the surgical suite. For example, a hospital system could be designed to identify the present and future occupants of rooms so that individuals could be easily located and timely information retrieved as to availability of rooms.

Although it is anticipated that, at least in the early applications of the instant invention, inputting of information will normally be through key boards and/or signal switches, it should be understood that the invention is not limited to use of such devices. Depending upon the particular application, telephone, radio, microwave, infrared and other devices and methods of transmitting signals could be used. In an industrial setting where dynamic scheduling depends upon personnel in

the field arriving and departing from a myriad of different locations, telephones or "beepers" could be used to input current information. Similarly, conflict indicia or rescheduling information could automatically be communicated to field personnel by means of "beepers" or other such devices.

While it is believed that a cathode ray tube display is most suitable for use in practicing the instant invention, the term "display" has been used herein much more generically. Depending upon the particular application, hard copy, e.g., a paper print-out, might be an acceptable display. Similarly, an array of incandescent bulbs might be adequate. Other, more or less sophisticated displays could also be employed.

Finally, the above-described embodiments of the invention are intended to be illustrative only. Numerous alternative embodiments may be devised by those skilled in the art without departing from the spirit and the scope of the following claims.

CLAIMS

1. A method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

creating a data base of information about at least some of said resources;

identifying some of said resources as being primary, and other resources as being secondary;

establishing temporal relationships between at least some of said resources;

prospectively scheduling utilization of at least some of said primary resources and at least some of said secondary resources;

determining whether any of said scheduled utilizations of one of said resources is incompatible with the scheduled utilization of the same or another resource;

communicating, by means of conflict indicia, the existence of any said incompatible scheduled utilizations.

2. The method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

creating a data base of information about at least some of said resources;

including in said data base permissible and impermissible uses of at least some of said resources;

prospectively scheduling utilization of at least some of said resources;

searching said data base to determine if any of said scheduled utilizations constitutes an impermissible use;

communicating, by means of conflict indicia, said impermissible scheduled utilizations.

3. The method of claim 1 or 2 wherein communication of at least some of said conflict indicia is by means of sound.

4. The method of claim 1 or 2 wherein communication of at least some of said conflict indicia is by means of light, radio waves or other electromagnetic radiation.

5. The method of claim 1 further comprising an optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

6. The method of claim 2 further comprising an optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

7. The method of claim 6 wherein said prospectively scheduled utilization is reflected on said display in the form of scheduling indicia.

8. The method of claim 7 further comprising the steps of:

obtaining information representing actual utilization of at least one of said resources at a point in time subsequent to the first scheduled utilization of said resource;

communicating said actual utilization information by having same appear on said display in the form of status indicia.

9. The method of claim 8 further comprising the steps of:

determining whether said actual utilization is inconsistent with any prior scheduled utilizations of any resource;

rescheduling at least one of said inconsistent previously scheduled utilizations.

10. The method of claim 8 further comprising the step of recording said actual utilizations.

11. The method of claim 1 further comprising the steps of:

obtaining information representing actual utilization of at least one of said resources at a point in time subsequent to the first scheduled utilization of said resource;

determining whether said actual utilization is incompatible with any of said temporal relationships or with any information stored in said data base; and

communicating, by means of conflict indicia, the existence of any such incompatible utilizations.

12. A system for prospectively planning utilization of a multiplicity of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory containing information about at least some of said resources;

a set of primary resources and a set of secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

means for comparing at least one of said scheduled utilizations with at least one other

scheduled utilization or with information in said data base, to detect incompatibilities; and

means for communicating, by use of conflict indicia, the existence of detected incompatibilities.

13. The system of claim 12 further comprising an optically recognizable display.

14. The system of claim 13 wherein at least some of said scheduling information is made to appear, by means of scheduling indicia, on said display.

15. The system of claim 14 wherein at least some of said conflict indicia are made to appear on said display.

16. The system of claim 15 wherein said scheduling information reflects planned utilization of at least some of said primary resources as a function of time.

17. The system of claim 16 wherein at least some of said scheduling information incorporates information about utilization of at least some of said secondary resources.

18. A system for prospectively scheduling, periodic monitoring and managing utilization of a plurality of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory, containing information about at least some of said resources;

a set of primary resources and a set of secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

means for communicating at least some of said prospectively scheduled utilization information through use of scheduling indicia;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base to detect incompatibilities;

means for communicating, by use of conflict indicia, the existence of detected incompatibilities;

means for collecting information about actual utilization of at least one of said primary resources subsequent to the first scheduled use of a resource;

means for modifying at least one of said scheduled utilizations to reflect variances between said actual utilization and said prospectively scheduled utilization.

36 ~~45~~ 19. The system of claim ~~18~~ 35 further comprising means for inputting the actual status of utilization of at least one of said primary resources at a point in time subsequent to the initial planned utilization of at least one of said primary resources.

~~46~~ 37 20. The system of claim ~~19~~ 36 further comprising means for collecting information about actual utilization of at least one of said primary resources at a point in time subsequent to the first prospectively scheduled utilization thereof and means for communicating said actual utilization information by use of status indicia.

~~47~~ 38 21. The system of claim ~~20~~ 37 further comprising means for comparing said actual utilization of at least one of said primary resources with the prospectively scheduled utilization of said resource and means for communicating, through use of status indicia, the results of said comparison.

46 35
~~22~~ 44. The system of claim ~~18~~ wherein said means for collecting said actual utilization information includes real-time clock means.

~~50~~ 42 36
~~23~~. The system of claim ~~19~~ wherein said means for inputting said actual utilization status of resources includes real time clock means.

39 ~~48~~ 46 37
~~24~~. The system of claim ~~20~~ wherein said means for collecting information about actual utilization of resources includes real time clock means.

48 ~~66~~ 44 35
~~25~~. The system of claim ~~18~~ further comprising means for detecting modification-caused incompatible utilizations and communicating said detected modification-caused incompatibilities by use of conflict indicia.

Sub B 57 26. The system of claim 18 further comprising optical display means for displaying at least one of said scheduling indicia or said conflict indicia.

27. The system of claim 20 further comprising optical display means for displaying at least one of said scheduling indicia, said conflict indica or said status indicia.

B

28. The system of claim 25 further comprising optical display means for displaying at least one of said scheduling indicia, said conflict indicia or said status indicia.

51 35
~~54~~ 44
~~29~~. The system of claim ~~18~~ wherein said modifying means includes means for automatically altering at least one of said scheduled utilizations in response to

detection of at least one modification-caused incompatibility.

30. The system of claim 14 wherein at least some of said scheduling indicia appear in the form of a graphical display.

31. The system of claim 15 wherein at least some of said scheduling and conflict indicia appear in the form of a graphical display.

32. The system of claim 28 wherein at least some of said scheduling, conflict and status indicia appear in the form of a graphical display.

~~33~~ 53. The system of claim ~~30~~ 32, 31 or ~~32~~ 40 wherein said graphical display is made to appear concurrently with a textual display of information about utilization of at least some of said primary or secondary resources.

~~34~~ 54. The system of claim ~~13~~ 26 wherein information stored in said data base about at least one of said resources can be accessed and made to appear on said display.

~~35~~ 43. The system of claim ~~19~~ 36 further comprising means for recording the time of said inputting of said actual status utilization data.

~~36~~ 44. The system of claim ~~19~~ 36 further comprising means for recording the time of said actual status utilization.

COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled Method and System For Scheduling, Monitoring and Dynamically Managing Resources, the specification of which

[x] is attached hereto. [ ] was filed on _____ as Application Serial No. _____ and was amended _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Country	Application No.	Filed (Day/Mo./Yr.)	Priority Claimed (Yes/No)
N O N E			

I hereby appoint Joseph M. Fitzpatrick (Registration No. 17,398), John Thomas Cella (Registration No. 17,356), Lawrence F. Scinto (Registration No. 18,973), William J. Brunet (Registration No. 20,452), Robert L. Baechtold (Registration No. 20,860), John A. O'Brien (Registration No. 24,367), Nels T. Lippert (Registration No. 25,888), John A. Krause (Registration No. 24,613), Henry J. Renk (Registration No. 25,499), Peter Saxon (Registration No. 24,947), Anthony M. Zupcic (Registration No. 27,276), Charles P. Baker (Registration No. 26,702), Stevan J. Bosses (Registration No. 22, 291), Edward E. Vassallo (Registration No. 29,117), Ronald A. Clayton (Registration No. 26,718), Sidney R. Bresnick (Registration No. 24,094), Frederick J. Dorchak (Registration No. 29,298), Lawrence A. Stahl (Registration No. 30,110), Laura A. Bauer (Registration No. 29,767), Gary R. Molnar (Registration No. 30,299), Leonard P. Diana (Registration No. 29,296), David M. Quinlan (Registration No. 26,641), Nicholas N. Kallas (Registration No. 31,530), William M. Wannisky (Registration No. 28,373), Lawrence Alaburda (Registration No. 31,583), Frank J. Kowalski (Registration No. 28,434), Lawrence S. Perry (Registration No. 31,865), Robert H. Fischer (Registration No. 30,051), Christopher Philip Wrist (Registration No. 32,078), Gary M. Jacobs (Registration No. 28,861), Grover F. Fuller, Jr. (Registration No. 31,760), Rudolph J. Anderson, Jr. (Registration No. 16,792), and Michael K. O'Neill (Registration No. 32,622),

my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

Address all correspondence to:

Stevan J. Bosses, Esq.
Fitzpatrick, Cella, Harper & Scinto
277 Park Avenue
New York, N.Y. 10172
Telephone No. (212) 758-2400

6.87

COMBINED DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION

(Page 2)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor William R. Rassman
Inventor's signature William R. Rassman
Date Sept 9, 1987 Citizen/~~Subject~~ of U.S.A.
Residence 29052 Woodcreek Court, Agoura, CA. 91301
Post Office Address intelliMED Corporation
2125 Center Ave., Fort Lee, N.J. 07024-5859

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Second Inventor's signature Bradley M. Berman
Date 9/8/87 Citizen/~~Subject~~ of U.S.A.
Residence 3320 North 48th Ave., Omaha, Neb. 68104
Post Office Address intelliMED Corporation
2125 Center Ave., Fort Lee, N.J. 07024-5859

Full Name of Third Joint Inventor, if any Scott Blau
Third Inventor's signature Scott Blau
Date 9/8/87 Citizen/~~Subject of~~ U.S.A.
Residence 41 Prospect Drive, Yonkers, N.Y. 10705
Post Office Address intelliMED Corporation
2125 Center Ave., Fort Lee, N.J. 07024-5859

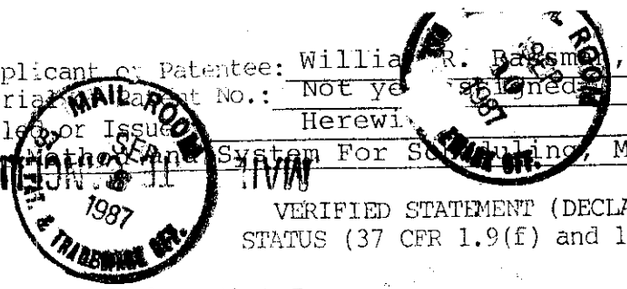
Full Name of Fourth Joint Inventor, if any Andrew Chiang
Fourth Inventor's signature Andrew Chiang
Date Sept 9th, 1987 Citizen/~~Subject~~ of U.S.A.
Residence 387 Lincoln Ave., Fort Lee, N.J. 07024
Post Office Address intelliMED Corporation
2125 Center Ave., Fort Lee, N.J. 07024-5859

Full Name of Fifth Joint Inventor, if any _____
Fifth Inventor's signature _____
Date _____ Citizen/Subject of _____
Residence _____
Post Office Address _____

Full Name of Sixth Joint Inventor, if any _____
Sixth Inventor's signature _____
Date _____ Citizen/Subject of _____
Residence _____
Post Office Address _____

Applicant or Patentee: William R. Rassman, et al.
Serial or Patent No.: Not yet assigned
Filed or Issued: Herewith
For: Method and System For Scheduling, Mon. and Dynamically Managing Resources

Attorney's Docket No.: 924.1



VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN

I hereby declare that I am

[ ] the owner of the small business concern identified below:
[x] an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN intelliMED Corporation
ADDRESS OF CONCERN 2125 Center Avenue
Fort Lee, N.J. 07024-5859

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled Method and Syst. For Sched., Mon.& Dynam. Managing Resources by inventor(s) W. R. Rassman, B.M. Berman, S. Blau & A. Chiang described in

[x] the specification filed herewith
[ ] application serial no. _____, filed _____
[ ] patent no. _____, issued _____.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).
*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

NAME _____
ADDRESS _____
[ ] INDIVIDUAL [ ] SMALL BUSINESS CONCERN [ ] NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING William R. Rassman
TITLE OF PERSON OTHER THAN OWNER Chief Executive Officer
ADDRESS OF PERSON SIGNING 29052 Woodcreek Court, Agoura, CA. 91301
SIGNATURE _____ DATE September 8, 1987

0218V

Print Of Drawing
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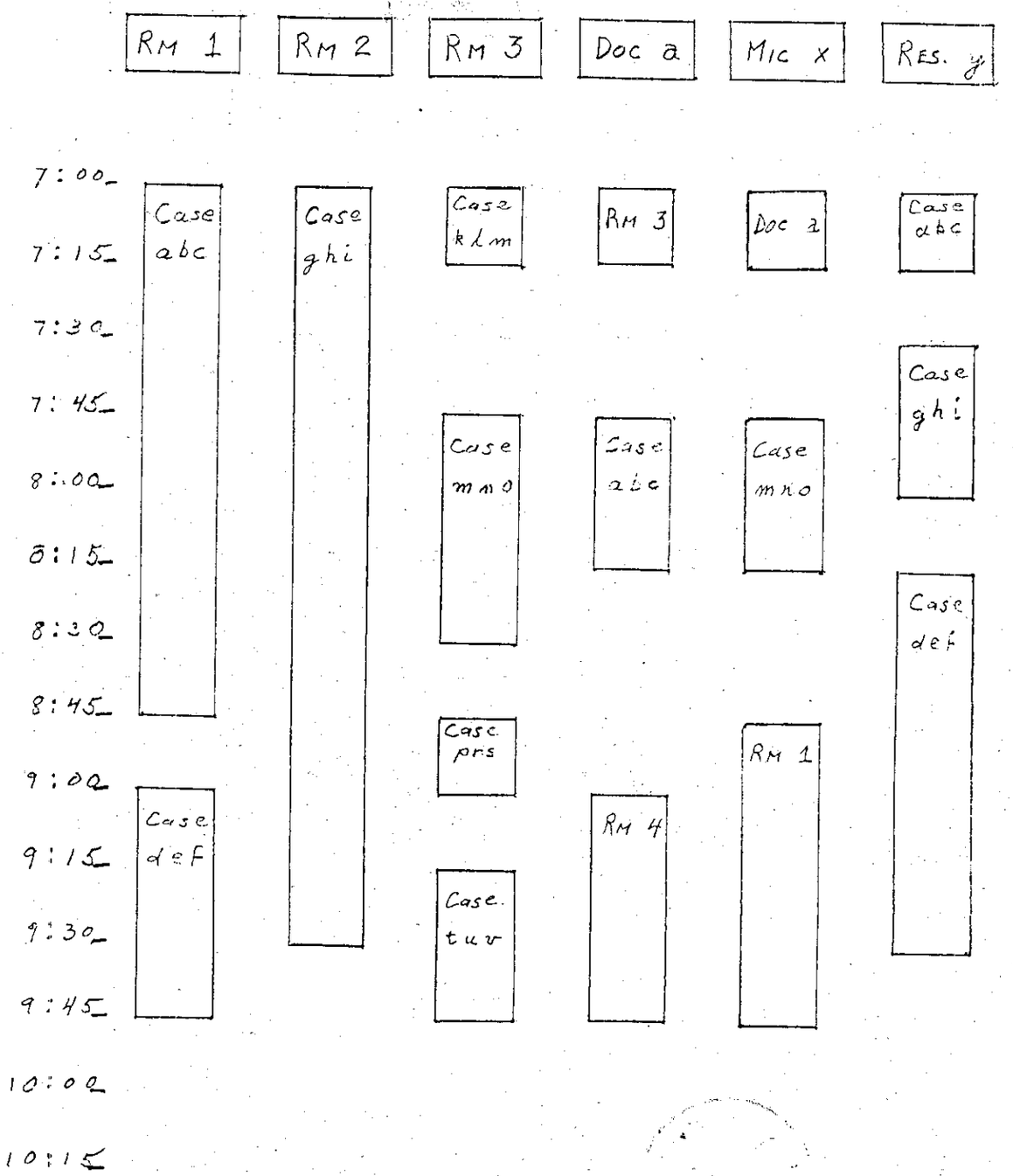

FIG. 1

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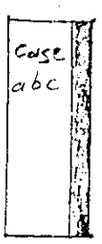

FIG 1A

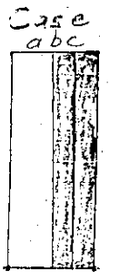

FIG 1D

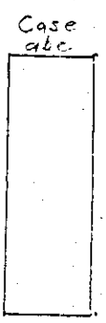

FIG 1B

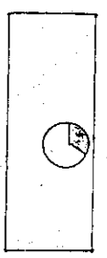

FIG 1E

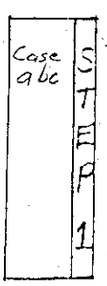

FIG 1C

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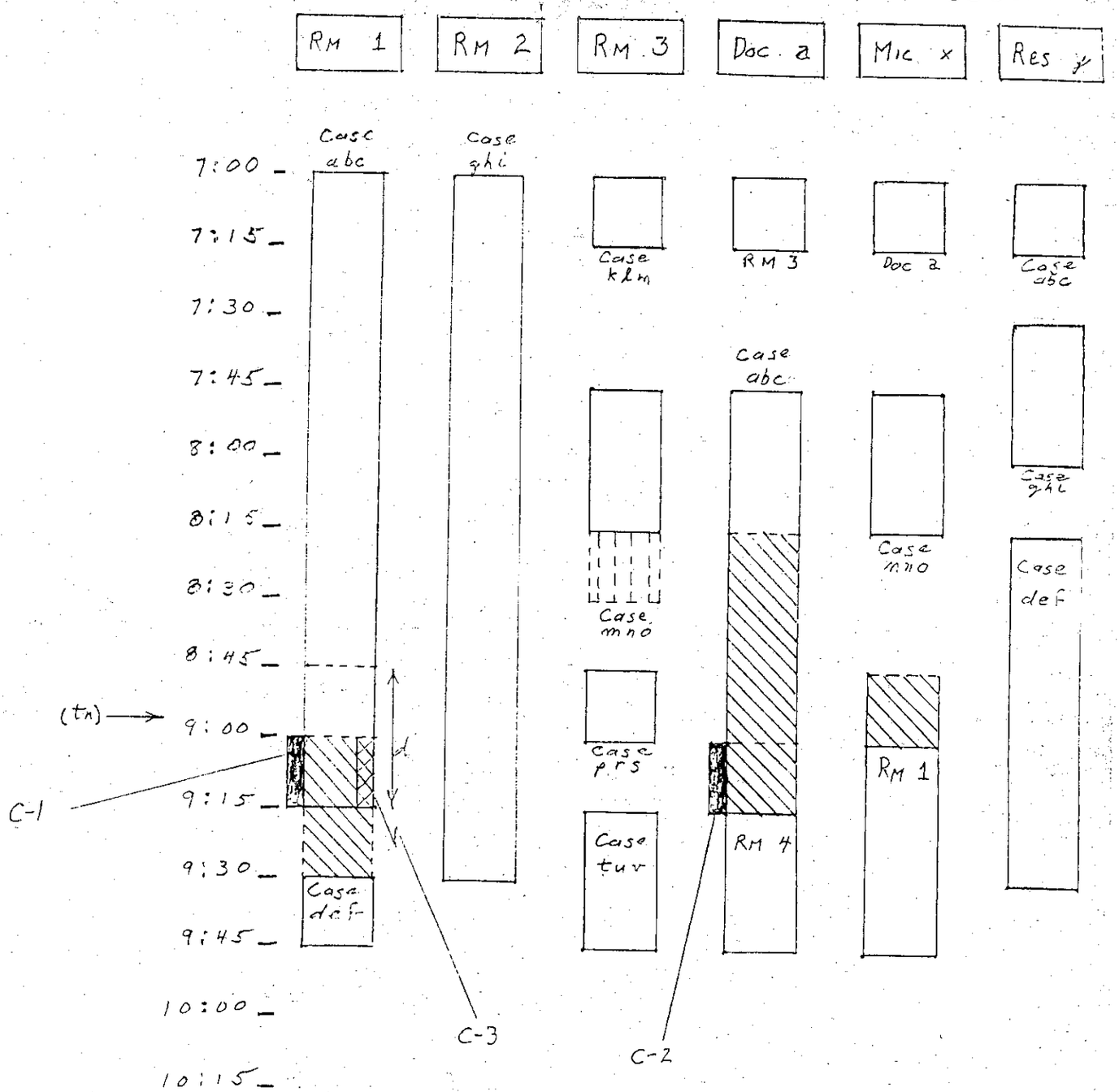

FIG 2

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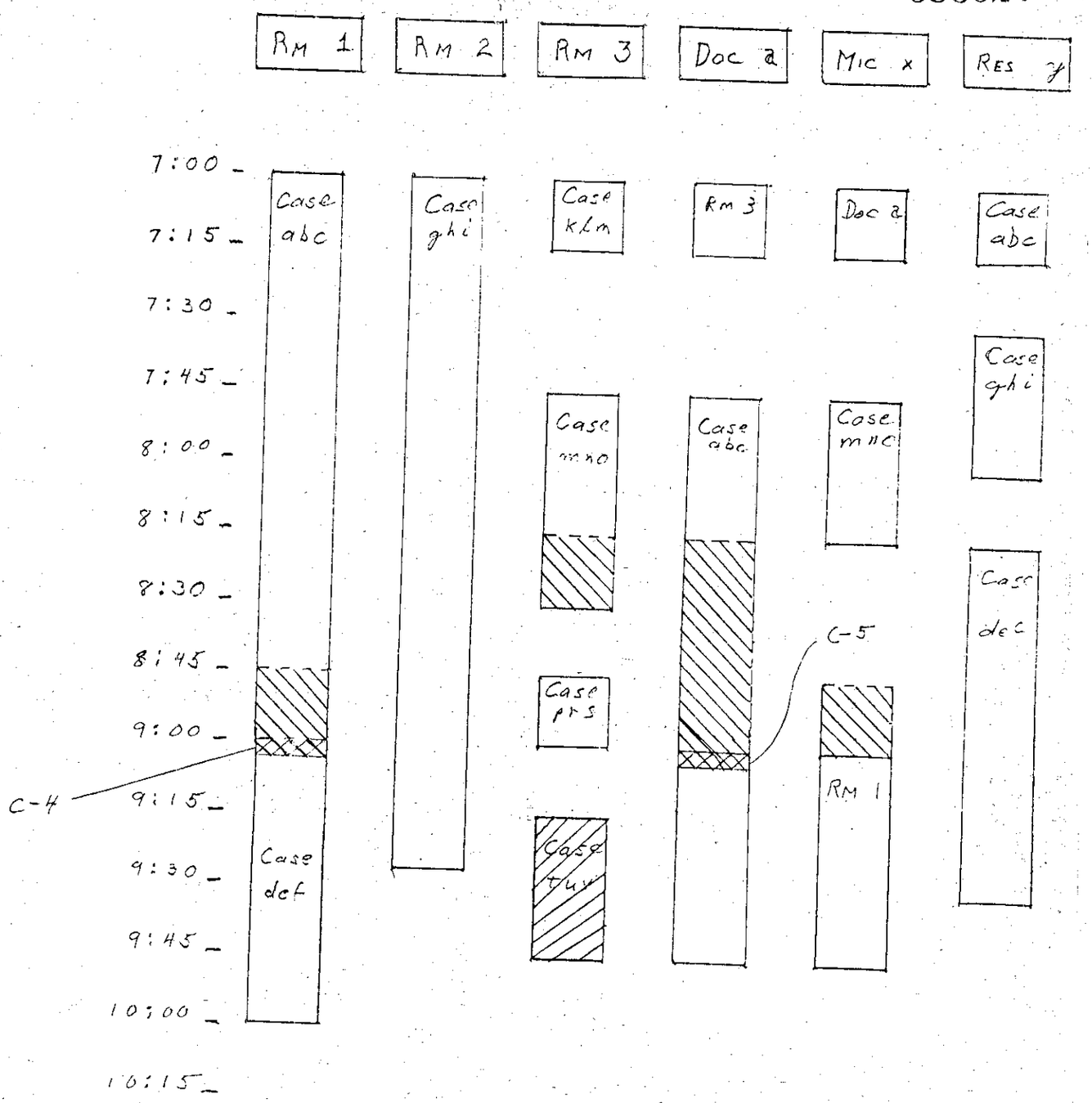

FIG. 3

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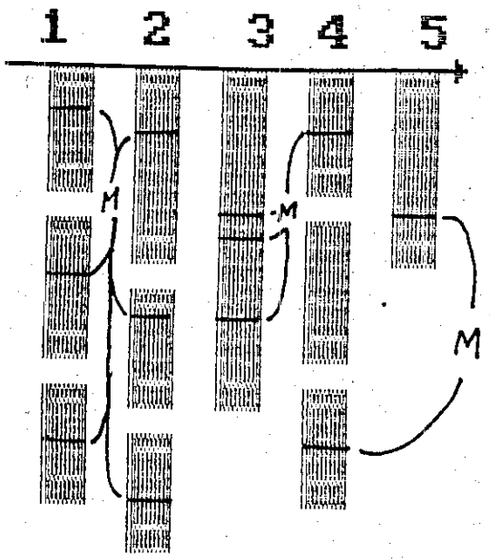
Operating Room



8:05

Rm 1	Appendectomy Dr Jones Pt Hawks
Rm 2	D & C Dr Sims Pt Carpy
Rm 3	Craniotomy Dr Smith Pt Hardy
Rm 4	Gastrectomy Dr Hopps Pt Dines
Rm 5	Excis. R Leg Mass Dr Gibbs Pt Glass

FIG. 4

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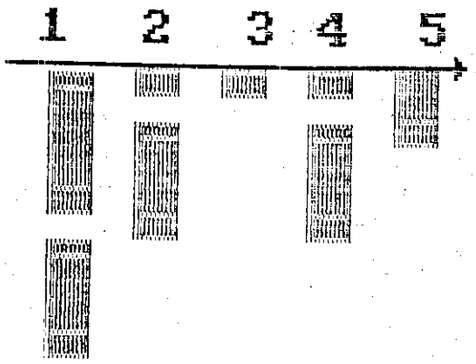
Operating Room



11:25

Rm 1	ROOM EMPTY
Rm 2	D & C Dr Sims Pt Carpy
Rm 3	Craniotomy Dr Smith Pt Hardy
Rm 4	Gastrectomy Dr Hopps Pt Dines
Rm 5	Excis. R Leg Mass Dr Gibbs Pt Glass

FIG. 5

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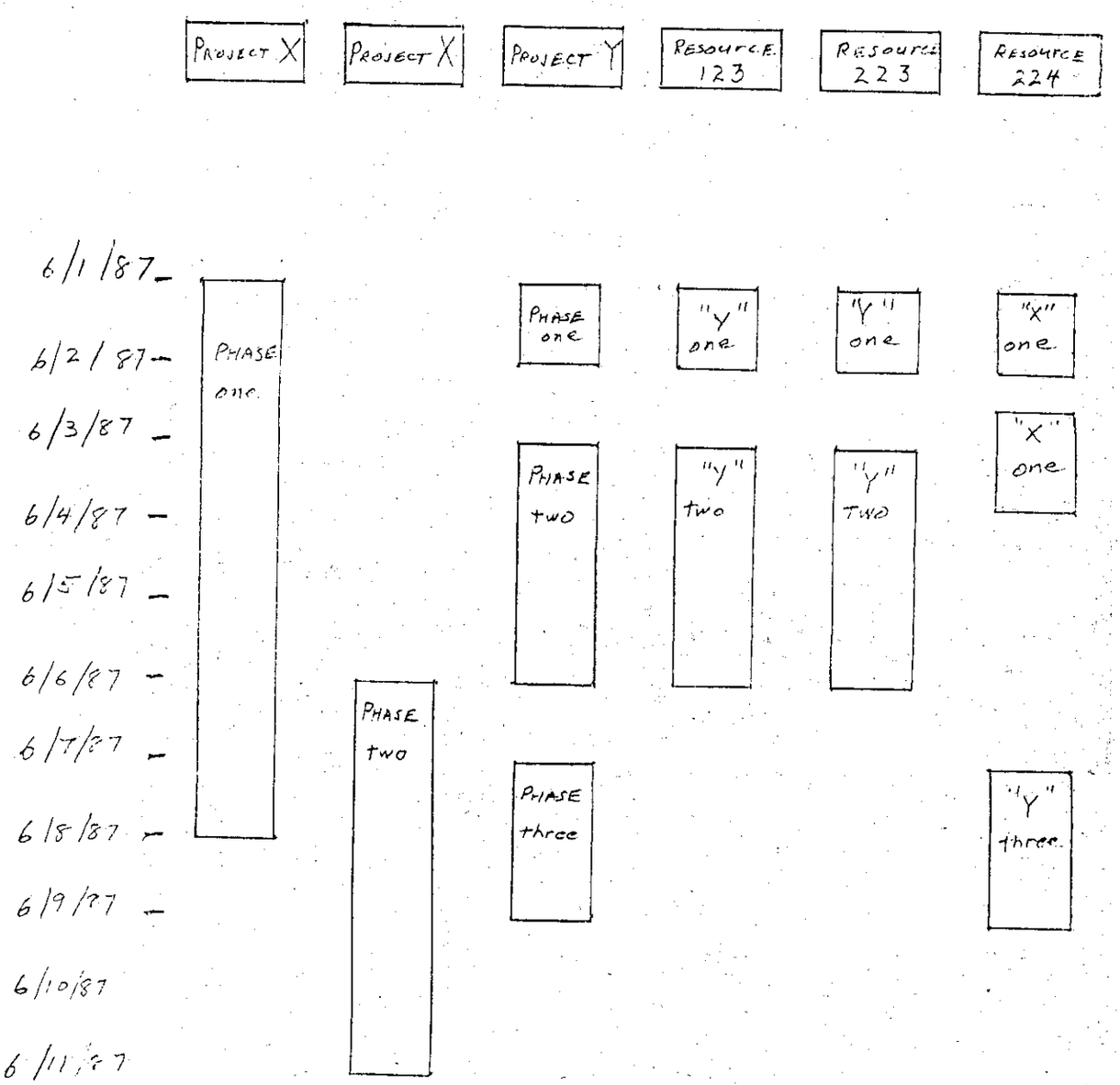
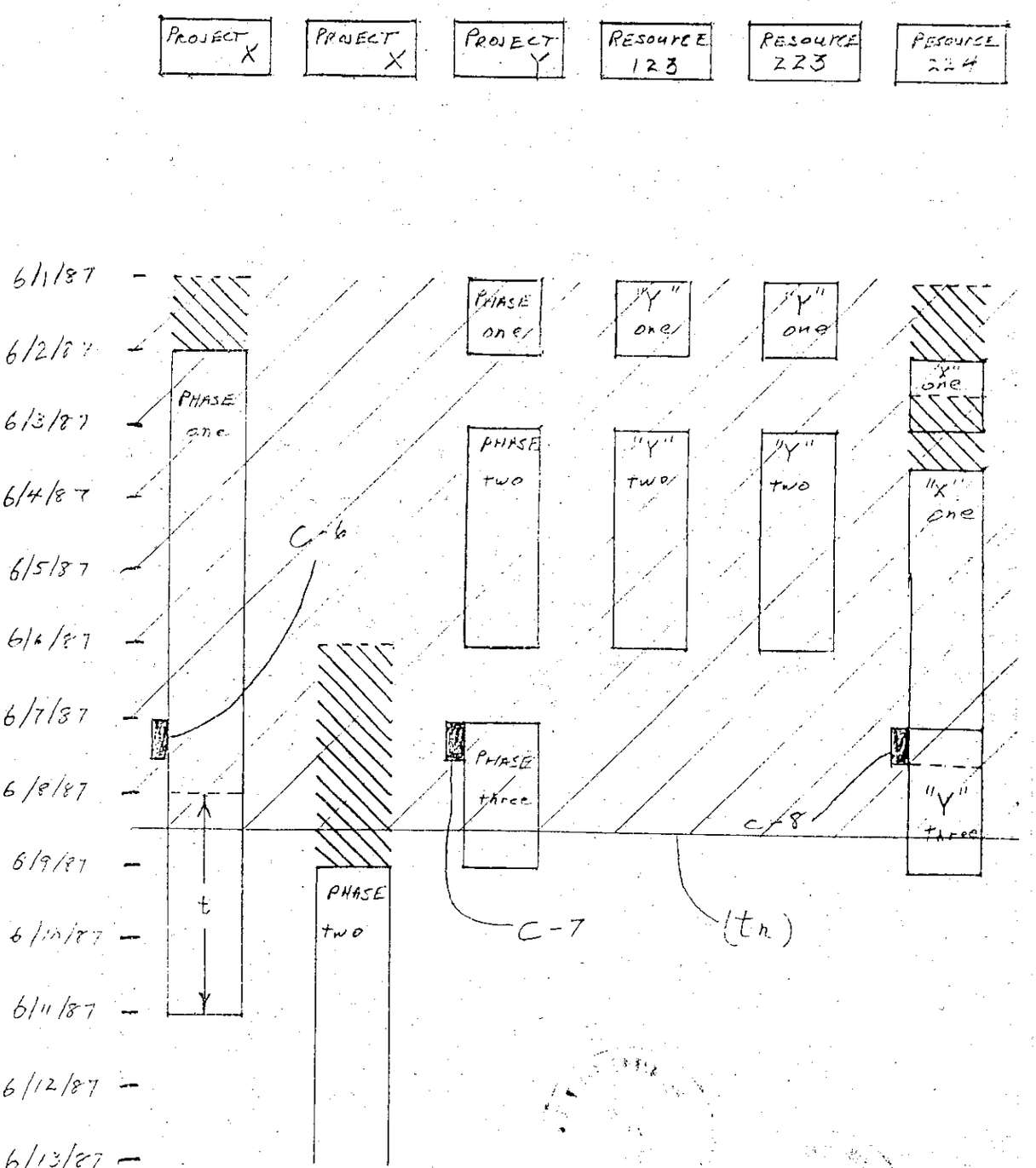


FIG. 6


PROJECT X
PROJECT X
PROJECT Y
RESOURCE 123
RESOURCE 223
RESOURCE 224
6/1/87
6/2/87
6/3/87
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6/6/87
6/7/87
6/8/87
6/9/87
6/10/87
6/11/87
6/12/87
6/13/87
PHASE one
PHASE two
PHASE three
"Y" one
"Y" two
"Y" one
"X" one
"X" one
"Y" two
"Y" three
C-6
C-7
C-8
t
(tn)

FIG. 7

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As Original Filed

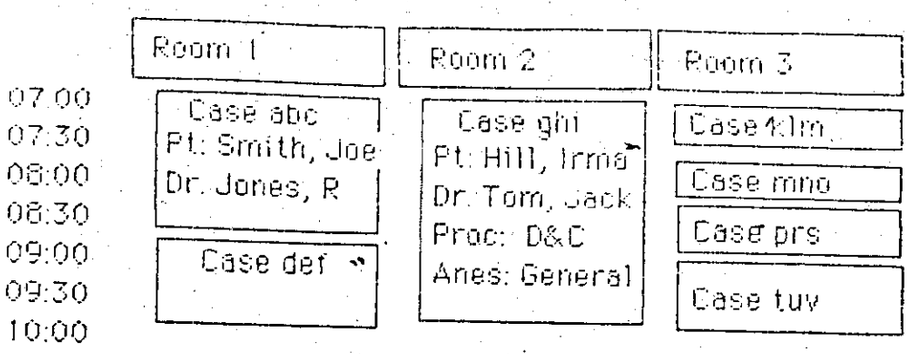

FIG. 8

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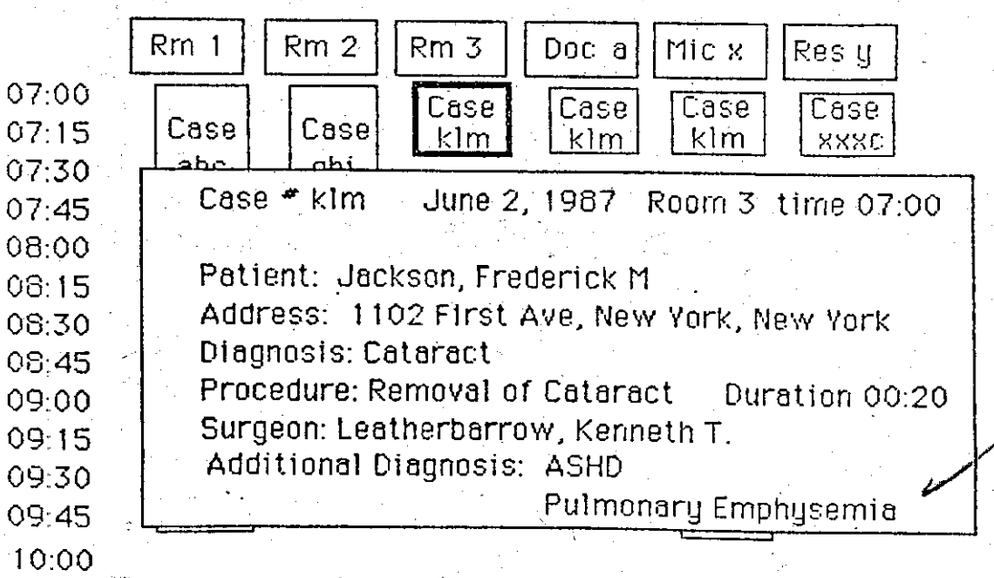

FIG. 9

Attorn ocket No. 924.1

Date: September 9, 1987

096027

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THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 202

MAIL ROOM 37 SEP 10 1987 PAT. & TRADEMARK OFF.

Sir:

Transmitted herewith for filing is the patent application of

Inventor: William R. Pressman, Bradley M. Berman, Scott Blau and Andrew Chiang

For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

Enclosed are:

|XX| Specification and Claim(s).

|XX| Oath or Declaration.

|XX| 10 sheet(s) of ~~formal~~ informal drawing.

|XX| An assignment of the invention to intelliMED Corporation (Kindly return recorded assignment to the attention of the undersigned).

|__| Certified copies of _____ priority application(s).

|__| Associate power of attorney.

The fee has been calculated as shown below:

	CLAIMS AS FILED			
FOR	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE $170°/$340
TOTAL CLAIMS	40 -20	20	$6° x $12	$120
INDEP. CLAIMS	4 -3	1	$17° x $34	17
Fee for Multiple Dependent Claims $ 55°/$110				110
			TOTAL FILING FEE -------	$417

|XX| °Verified Statement claiming small entity status in enclosed.

|__| Charge $_____ to Deposit Account No. 06-1205. A duplicate copy of this sheet is enclosed.

|X| The Commissioner is hereby authorized to charge any additional fees which may be required, or credit overpayment to Deposit Account No. 06-1205. A duplicate copy of this sheet is enclosed.

|XX| A check in the amount of $417.00 to cover the filing fee is enclosed.

|XX| A check in the amount of $7.00 to cover the recordal fee is enclosed. A duplicate copy of this sheet is enclosed.

Stuart J. Bosse
Attorney of Record
Reg. No. 22,291

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, NY 10172
(212) 758-2400

924.1

#2

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	
WILLIAM R. RASSMAN et al.	)	Examiner:
	:	
Serial No.: 096,027	)	Group Art Unit: 236
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	) :	November 5, 1987

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to the provisions of 37 C.F.R. 1.97 et seq., applicant submits herewith, for consideration by the Examiner, the patents (U.S. Patents Nos. 3,725,650, 4,646,238, 4,547,851, 4,591,983 and 4,336,589) listed in attached form PTO-1449.

The relevance of these patents is explained in detail on pages 2-3 of the specification.

It is respectfully requested that these patents be considered by the Examiner and made of record in the subject application.

Respectfully submitted,

Stevan J. Bosses
Attorney of Record
Reg. No. 22,291

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
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RECEIVED
GROUP 230

OMB No. 0651-0031 (12/31/86)

INFORMATION DISCLOSURE CITATION

(Use several sheets if necessary)

ATTY. DOCKET NO.	SERIAL NO.
924.1	096,027
APPLICANT: WILLIAM R. RASSMAN et al.	
FILING DATE: 9/10/87	GROUP: 236

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
MoH		3 7 2 5 6 5 0	4/3/73	Gelder	235	151.3	
MoH		4 6 4 6 2 3 8	2/24/87	Carlson, Jr., et al.	364	403	
MoH		4 5 4 7 8 5 1	10/15/87	Kurland	364	401	
MoH		4 5 9 1 9 8 3	5/27/86	Bennett, et al.	364	403	
MoH		4 3 3 6 5 8 9	6/22/82	Smith, et al.	364	403	

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO

OTHER PRIOR ART *(Including Author, Title, Date, Pertinent Pages, Etc.)*

EXAMINER	DATE CONSIDERED
Hayes	9-17-88

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

BH

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

EXAMINER	
ART UNIT	**PAPER NUMBER**
2306	3

DATE MAILED: OCT 07 1988

This is a communication from the examiner in charge of your application.

COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), ____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☐ Notice of References Cited by Examiner, PTO-892.
2. ☑ Notice re Patent Drawing, PTO-948.
3. ☑ Notice of Art Cited by Applicant, PTO-1449
4. ☐ Notice of Informal Patent Application, Form PTO-152
5. ☐ Information on How to Effect Drawing Changes, PTO-1474
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☑ Claims 1-36 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims 1-36 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings which are acceptable for examination purposes until such time as allowable subject matter is indicated.

8. ☐ Allowable subject matter having been indicated, formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. These drawings are ☐ acceptable; ☐ not acceptable (see explanation).

10. ☐ The proposed drawing correction and/or the ☐ proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed _____, has been ☐ approved. ☐ disapproved (see explanation). However, the Patent and Trademark Office no longer makes drawing changes. It is now applicant's responsibility to ensure that the drawings are corrected. Corrections MUST be effected in accordance with the instructions set forth on the attached letter "INFORMATION ON HOW TO EFFECT DRAWING CHANGES", PTO-1474.

12. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

1. Claims 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 adds an "optically recognizable" display to the system of claim 12. The Examiner finds the phrase "optically recognizable" vague and indefinite since it literally implies use of means recognizable on sight as display means. For purposes of applying art, the Examiner assumes that means to display information is intended. Claims 14-17 are rejected by virtue of their dependence on claim 13.

2. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 1-36 are rejected in view of Time Line.

Independent claims 1, 12, and 18 are directed to a method and systems of prospective planning for use of a plurality of related resources. The systems of claims 12 and 18 include: (1) a data base for storing information about resources; (2) primary and secondary resource sets; (3) means to schedule future use of primary resources and to indicate scheduled use through indicia; (4) means to detect conflicting or incompatible scheduled use of resources; and (5) means to communicate conflict to the user. Claim 18 further includes means to collect information about actual primary resource use and to modify other scheduled resource use to reflect any changes in actual and scheduled use of a primary resource.

Claim 2 is directed to a method of prospective resource use. Resource information is stored in a database along with information on permissable and impermissable resource use. The database is search for an impermissable scheduled resource use.

Time Line is a computer based project management system implemented via use of databases. The system allows a user to store information about resources and to use this information to assign resources and allocate tasks. Tasks maybe designated as independent or dependent and as critical or non-critical. Tasks involve use of resources and resource use is therefore

labeled as independent or dependent and as critical and non-critical. Resource Leveling allows Time Line to detect when resources have been overbooked. The Examiner asserts that when a resource is overbooked, a conflict exists between scheduled uses. The user is alerted to the overbooking as well as to schedule modifications which would avoid possible conflicts. Claims 1 and 12 are rejected for obviousness.

The Examiner asserts that overbooking of a resource constitutes an impermissable use. Resource Leveling therefore detects impermissable uses and alerts the user to such a condition. Claim 2 is rejected for obviousness.

Time Line allows the user to update schedules after the project has started. The user may input both actual and planned schedules into the system. Time Line compares the two schedules and allows modification of schedules in order to keep the project on track, see pages 22-23. Claim 18 is rejected for obviousness.

Claims 3/1 and 3/2 include audible means to indicate a conflicting schedule use of stored resources. The Examiner asserts that use of an audible alarm to alert a user or operator of an alarm condition is well known. Motivation to consider conflicting use of resources as an alarm condition would be the importance the user places on resource use. If the unavailability

of a resource would result in great loss, the Examiner asserts that a conflict barring intended use would be cause for the user to consider the conflict an alarm condition. Claims 3/1 and 3/2 are rejected for obviousness.

Claims 4/1 and 4/2 include use of electromagnetic waves, such as light, to indicate existence of a conflict. The Examiner asserts that use of a flashing LED to indicate an alarm status is well known. Motivation to treat conflicts of scheduled use as an alarm condition is discussed above. Claims 4/1 and 4/2 are rejected for obviousness.

Claims 5-6 and 15 make use of display means to indicate conflicting scheduled resource use. As indicated on page 16 of the Time Line manual, the user is alerted to overbooking of resources. Since Time Line is implemented on a database system, the Examiner asserts that display means would be the obvious way to alert users. see Resource Leveling. Claims 5-6 and 15 are rejected for obviousness.

Claim 7 requires use of scheduling indicia. Page 126 illustrates use of a Gnatt report as scheduling indicia. Claim 7 is rejected for obviousness.

Claims 8-11 include steps of obtaining information on scheduled and actual resource use; indicating actual use information by status indicia; determining if actual and scheduled use are consistent; and rescheduling

future scheduled use if inconsistencies exist. As discussed above, Resource Leveling allows an update of schedules in view of changes in the actual use of resource. Claim 8-11 are rejected for obviousness.

Claims 13-14 incorporate subject matter analogous to claims 4, 7, and 6 respectively. Claims 13-14 are therefore rejected on the same basis as claims 4, 7, and 6.

Time Line allows designation of tasks (and thus resources) as dependent or independent. The Examiner asserts that a task in the parent position of a chain of interdependent tasks is a primary tasks. The dependent tasks would therefore be secondary tasks. Claims 16-17 are rejected for obviousness.

Time Line allows input of actual tasks completion (and thus of resource use) for comparison with proposed schedules. The Examiner asserts that independent as well as dependent tasks can be input. If information about actual task completion (and resource use) is input into the Time Line system, the Examiner asserts that means to collect information about task completion and means to input this information must also exist. Status indicators are available in Time Line's Actual vs. Planned Reports. Claims 19-21 are rejected for obviousness.

Claims 22-24 include use of real time clock means in means to update actual use of resource infor-

mation. The Examiner's asserts that real time, clocks are routinely used in computers and that as Time Line is implemented on a computer system, this system must function as input means for actual use information. It is therefore obvious to include a real time clock. Claims 22-24 are rejected for obviousness.

As indicated in the Time Line manual, tasks may slip in schedule and the entire schedule may need to be reworked to accommodate these changes, see page 23. The Examiner asserts that when the user inputs actual tasks completions in the Actual vs. Planned report generation system of Time Line, any conflicts with currently scheduled tasks will be indicated to the user, see page 22-23. Claim 25 is rejected for obviousness.

Claims 26-28 include use of display means for output of conflict indicia. As indicated in the rejection of claim 18, indications of conflicts to users is accomplished by Time Line. Further, as Time Line is implemented on a computer system, and as display means are routinely found in computer systems. Applicant's use constitutes a design choice of readily available output means. Claims 26-28 are therefore rejected for obviousness.

Time line will revise schedules when conflicts are found, see pages 22-23 and 16. Claim 29 is rejected for obviousness.

Time Line makes use of Gnatt Chart reports to illustrate proposed schedules. The Examiner asserts that it would be a simple manner to use these charts for the Actual vs. Planned reports generated to Time Line. Motivation to do so would be the routine use by Gnatt reports to illustrate schedules. Claims 30-32 are rejected for obviousness.

The Gnatt chart utilizes status indicators along with graphics, see p. 126. Claim 33 is rejected for obviousness.

Claim 34 requires use of means to access information stored in a database about resources. The Examiner asserts that as Time Line allows rescheduling of tasks (and thus of resources), stored information about resources can be accessed. Claim 34 is rejected for obviousness.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gail Hayes whose telephone number is (703) 557-8024.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 557-2878.

G.O.H.

GH/MS

9/27/88

Joseph Ruggiero

JOSEPH RUGGIERO
PRIMARY EXAMINER
ART UNIT 236

TO SEPARATE, H[illegible]D TOP AND BOTTOM EDGES, SNAP-APART AND [illegible]CARD CARBON

BH

FORM PTO-892 (REV. 3-78) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	SERIAL NO.	GROUP ART UNIT	ATTACHMENT TO PAPER NUMBER
NOTICE OF REFERENCES CITED	096027	236	3
	APPLICANT(S) Rassman et al		

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE
	A	4019027	Apr 1977	Kelly	434	108	
	B	4700318	Oct 1987	Ockman	364	518	
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG	PERTINENT PP. SPEC.
	L								
	M								
	N								
	O								
	P								
	Q								

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

R Henry Fersko-Weiss, "Master Plan: Project Management Software" PC Magazine, Sept 29, 1987, pp. 153-157

S Renouard, C.A., "A Computerized Inventory Model For Production Control", Control Engineering, Apr 1971, pp. 61-64

T Andrew Layman, Time-Line, pp. 3-9, 19-27, 113-119, 124-127, 1984

U [illegible]

EXAMINER	DATE
Hayes	9-1-88

* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05 (a).)

SH

PTO - 948
(Rev. 6-/72)

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

ATTACHMENT TO PAPER NUMBER 3

S.N. 096027

GROUP

NOTICE OF PATENT DRAWINGS OBJECTION

Drawing Corrections and/or new drawings may only be submitted in the manner set forth in the attached letter, "Information on How to Effect Drawing Changes" PTO-1474.

A. ☒ The drawings, filed on 9/10/87, are objected to as informal for reason(s) checked below:

1. ☒ Lines Pale.
2. ☐ Paper Poor.
3. ☐ Numerals Poor.
4. ☒ Lines Rough and Blurred.
5. ☐ Shade Lines Required.
6. ☐ Figures Must be Numbered.
7. ☐ Heading Space Required.
8. ☐ Figures Must Not be Connected.
9. ☐ Criss-Cross Hatching Objectionable.
10. ☐ Double-Line Hatching Objectionable.
11. ☐ Parts in Section Must Be Hatched.
12. ☐ Solid Black Objectionable.
13. ☐ Figure Legends Placed Incorrectly.
14. ☐ Mounted Photographs.
15. ☐ Extraneous Matter Objectionable. [37 CFR 1.84 (1)]
16. ☒ Paper Undersized; either 8½" x 14", or 21.0 cm. x 29.7 cm. required.
17. ☐ Proper A4 Margins Required:
    ☐ TOP 2.5 cm. ☐ RIGHT 1.5 cm.
    ☐ LEFT 2.5 cm. ☐ BOTTOM 1.0 cm.
18. ☒ Other:
- characters poor
- lines must be solid, smooth & clean (Figs 4, 5 same thing with letterings)

B. ☒ The drawings, submitted on 9/10/87, are so informal they cannot be corrected. New drawings are required. Submission of the new drawings MUST be made in accordance with the attached letter.

11/14/88

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JAN 05 1989
GROUP 210

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	
WILLIAM R. RASSMAN et al.	)	Examiner: Hayes
	:	
Serial No.: 096,027	)	Group Art Unit 236
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	)	
	:	

August 24, 1988

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

4779-220
Recd-9-10-87

Sir:

POWER TO INSPECT

Kindly permit MARY LOU LEONARD or TROY M. BRONSON of Fitzpatrick, Cella, Harper & Scinto, 2011 Crystal Drive, Arlington, Virginia 22202, to insepct and make copies of the above-identified application and of its assignment.

Respectfully submitted,

Stevan J. Bosses
Attorney of Record
Reg. No. 22,291

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
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CERTIFICATION BRANCH, OPTS

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JAN 26 1989
GROUP 230

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner: G. Hayes
William Rassman et al.	Group Art Unit: 236
Serial No.: 096,027	
Filed: September 10, 1987	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	January 19, 1989

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OFFICE GROUP 230

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PETITION UNDER 37 C.F.R. § 1.136(a)

Sir:

Applicants petition the Commissioner of Patents and Trademarks to extend the time for response to the Office Action mailed October 7, 1988 for 1 month from January 7, 1989 to February 7, 1989.

Submitted herewith is a check in the amount of $28.00 to cover the fee for the extension. Any deficiency or overpayment of this extension fee should be charged or credited to deposit account number 06-1205. A duplicate copy of this sheet is enclosed.

FITZPATRICK, CELLA, HARPER & SCINTO
Attorneys for Applicant

By Stevan J. Bosses

Stevan J. Bosses
Registration No. 22,291
277 Park Avenue
New York, New York 10172
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1 215 28.00 CK

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MAIL ROOM JAN 23 1989 PAT & TRADEMARK OFFICE

16.00 203

924.1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: G. Hayes
William Rassman et al.	)	
	:	Group Art Unit: 236
Serial No.: 096,027	)	
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	)	
	:	January 19, 1989

RECEIVED JAN 23 1989 GROUP 230

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

AMENDMENT AND RESPONSE

Sir:

In response to the Official Action mailed October 7, 1988, the time for response having been extended by the accompanying Petition Under 37 C.F.R. § 1.136(a) up to and including February 7, 1989, please amend the above-identified patent application as follows:

IN THE CLAIMS:

Please amend Claims 1, 2, 12, 13 and 18 as follows:

1. (Amended) A method of prospectively planning utilization of a multiplicity of related resources using a computer ~~having a memory~~, including the steps of:

~~[~~creating a data base of information about at least some of said resources;~~]~~

identifying some of said resources as being primary, ~~and other resources~~ as being secondary;

establishing temporal relationships between at least some of said resources;

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creating a data base of information about at least one of said resources, at least some of which information is independent of said temporal relationships between resources;

prospectively scheduling utilization of at least some of said primary resources and at least some of said secondary resources;

determining whether any of said scheduled utilizations of one of said resources is incompatible with any of the information in said data base [the scheduled utilization of the same or another resource];

communicating, by means of conflict indicia, the existence of any said incompatible scheduled utilizations.

2. (Amended) The method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

creating a data base of information about at least some of said resources, at least some of which data is independent of temporal relationships between resources;

including in said data base permissible and impermissible uses of at least some of said resources;

prospectively scheduling utilization of at least some of said resources;

searching said data base to determine if any of said scheduled utilizations constitutes an impermissible use;

communicating, by means of conflict indicia, said impermissible scheduled utilizations.

12. (Amended) A system for prospectively planning utilization of a multiplicity of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory containing information about at least some of said resources, at least some of which information is independent of temporal relationships between resources;

a set [of] designated as primary resources and a set [of] designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base, to detect incompatibilities; and

means for communicating, by use of conflict indicia, the existence of detected incompatibilities.

13. (Amended) the system of claim 12 further comprising [an optically recognizable] means to display information.

18. (Amended) A system for prospectively scheduling, periodic monitoring and managing utilization of a plurality of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory, containing information about at least some of said resources, at least some of which information is independent of temporal relationships between resources;

a set [of] designated as primary resources and a set [of] designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a

function of time;

means for communicating at least some of said prospectively scheduled utilization information through use of scheduling indicia;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base to detect incompatibilities;

means for communicating, by use of conflict indicia, the existence of detected incompatibilities;

means for collecting information about actual utilization of at least one of said primary resources subsequent to the first scheduled use of a resource;

means for modifying at least one of said scheduled utilizations to reflect variances between said actual utilization and said prospectively scheduled utilization.

Please add claims 37 through 60 as follows:

37. The method of claim 2 further comprising the step of communicating at least two different types of conflict indicia.

38. The method of claim 37 wherein one of said conflict indicia identifies a temporal conflict and another of said conflict indicia identifies an impermissible use as determined by a search of said data base.

39. The method of claim 5 further comprising the step of displaying status indicia.

40. The method of claim 5 wherein at least two different types of conflict indicia are displayed.

41. The method of claim 40 wherein one of said types of conflict indicia identifies a temporal conflict and another conflict indicia identifies an impermissible use as determined by a search of said data base.

42. The method of claim 5 further comprising the steps of displaying utilization information about at least some primary resources;

displaying utilization information about at least some of said secondary resources; and

displaying a relationship between at least one of said primary resources to at least one of said secondary resources.

43. The method of claim 5 wherein there is displayed simultaneously at least some primary resources and at least secondary resource.

44. The method of claim 5 wherein the display of information is dynamic in that it reflects status information in real time.

45. The method of claim 5 wherein at least one of said conflict indicia identifies a real conflict and at least one other of said conflict indicia identifies an apparent conflict.

46. The method of claim 5 wherein said data base can be interrogated to cause a display of information about at least one of

said resources.

47. The method of claim 40 wherein at least some of said conflict indicia identify the type of conflict involved.

48. The method of claim 2 wherein said data base is comprised of a permanent or semi-permanent data base and a transitory data base.

49. The system of claim 12 or claim 18 wherein said data base is comprised of a semi-permanent data base and a transitory data base.

50. The system of claim 12 wherein at least two different kinds of conflict indicia are employed to communicate the existence of at least two different kinds of incompatibilities.

51. The system of claim 50 wherein at least one of said conflict indicia identifies a temporal incompatibility and at least one other conflict indicia identifies an incompatibility as determined by a search of said data base.

52. The system of claim 20 further comprising means for dynamically displaying, by use of said status indicia, the status of utilization of at least one of said resources in real time.

53. The system of claim 18 further comprising optical display means.

54. The system of claim 13 or 53 further comprising

means for displaying utilization information about at least some of said primary resources;

means for displaying utilization information about at least some of said secondary resources; and

means for displaying a relationship between at least one of said primary resources and at least one of said secondary resources.

57 ~~35~~ ~~55~~. The system of claim 26 ~~13~~ or 55 ~~61~~ ~~53~~ further comprising means for simultaneously displaying information about at least one primary resource and at least one secondary resource.

58 ~~36~~ ~~56~~. The system of claim 26 ~~13~~ or 55 ~~61~~ ~~53~~ further comprising means for dynamically displaying on said transient ~~optical~~ display, status information about the utilization of at least some of said resources in real time.

B

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59 ~~37~~ ~~57~~. The system of claims 26 ~~13~~ or 55 ~~61~~ ~~53~~ wherein at least one of said conflict indicia identifies a real conflict and at least one other conflict indicia identifies an apparent conflict.

60 ~~38~~ ~~58~~. The system of claim 26 ~~13~~ or 55 ~~61~~ ~~53~~ further comprising means for interrogating said data base to cause a display of information about one of said resources.

61 ~~39~~ ~~59~~. The system of claim 26 ~~13~~ and 55 ~~61~~ ~~53~~ wherein at least two different kinds of incompatibilities can be detected and wherein at least some of said conflict indicia identify the nature of the incompatibility associated therewith.

end

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13
~~15~~
~~60~~. The method of claim 1 further comprising the step of determining whether any of said scheduled utilizations is incompatible with any of said temporal relationships.

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REMARKS

Following receipt of the Office Action mailed October 7, 1988, the subject application was carefully reviewed and the foregoing amendments made to take into account the Examiner's comments and to point out and claim more clearly, more completely and more definitively that which the inventors consider to be their invention.

In the Office Action of October 7, the Examiner has noted that the drawings submitted with the application are informal. Applicants request that examination proceed on these informal drawings and that the requirement that formal drawings be filed be held in abeyance until claims have been allowed and prosecution on the merits closed.

This application now contains Claims 1-60, consisting of the original 36 claims, each of which has been rejected, and new claims 37-60, not previously examined. Claims 13-17 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention.

In Claim 13 the Examiner has objected to the phrase "optically recognizable" as being vague and indefinite. In order to apply art to claim 13, however, the Examiner has interpreted the phrase "optically recognizable display means" as being intended to connote means to display information. The Examiner is quite correct in this interpretation and the claim has been amended to adopt the Examiner's reading of it.

Claims 14-17 have been objected to as being vague and indefinite because each is dependent upon Claim 13. It is believed that the amendment to claim 13 overcomes the Examiner's § 112 rejection, not only for that claim, but also for its dependent claims 14-17 and reconsideration is therefore requested of each of Claims 13-17 and withdrawal of the § 112 objection solicited.

In addition to the § 112 rejection, all original claims (nos. 1-36) stand rejected under 35 U.S.C. § 103 as having been obvious and therefore unpatentable over the publication entitled "Time Line", pp. 3-9, 14-27, 113-119 and 124-127 (1984). Applicants respectfully traverse this rejection and request reconsideration thereof.

Time Line, as the Examiner recognizes, is a project management system. It is the type of system to which applicants were referring at page 3 lines 17-32 of the specification when they were discussing project planners. As noted in that discussion, project planners, like Time Line, are event or activity driven. The instant invention, on the other hand, is resource driven. This most fundamental divergence leads to a whole host of significant differences which, it is respectfully suggested, demonstrate that the instant invention is not rendered obvious by the Time Line reference.

Turning specifically to the original claims, four of them, namely claims 1, 2, 12 and 18 are independent, the remainder all being dependent. The preamble of each of the four independent claims defines the invention as one involving planning or managing "utilization of . . . resources. . . ." Time Line is not that. Time Line describes a method of scheduling events or activities.

Each of the preambles also calls for "a multiplicity of related resources." While Time Line teaches the monitoring

of resources and their availabilities (p.16), there is no teaching or suggestion regarding a multiplicity of related resources. The resources in Time Line are related to and monitored with respect to events, not with respect to one another.

The law is clear. In determining obviousness of a claim, when the facts of the case dictate, the preamble cannot be ignored. As the Court of Customs and Patent Appeals held in In re Duva, 387 F.2d 402, 406-407(?), 156 U.S.P.Q. 90, 94 (1967)

> all factual differences which may be properly noted in any portion of a claim must be included within the basis for comparison with the prior art if we are to properly evaluate the differences between the invention defined in claim and the teachings of a reference . . . . [W]e think every portion of the appealed claims must be considered in determining the invention as a whole in arriving at our decision as to obviousness required by a rejection under section 103.

When the Court said all parts of the claim are to be taken into account it meant to include specifically the preamble. In Duva the Examiner sought to ignore the preamble language "A process for depositing gold. . ." which the Court held to be an improper approach.

In In re Bullock and Kim, 604 F.2d 1362, 1365, 203 U.S.P.Q. 171, 174 (CCPA 1979) the Court, in commenting upon an approach which failed to give effect to the preamble of a claim, said

> The introductory claim language "stable color developer concentrate" is more than a mere statement of purpose; and that language is essential to particularly point out the invention defined by the claims."

Accordingly, the Court held, it was not to be ignored. Or, as the Court stated in somewhat different language, where "the limitations appearing in the preamble are necessary [as they are

here] to give meaning to the claim and properly define the invention. . . ." [Perkin Elmer Corp. v. Computervision Corp., 732 F. 2d 888, 896, 221 U.S.P.Q. 669,675 (Fed. Cir.), 469 U.S. 857, 225 U.S.P.Q. 792 (1984)], they must be taken into account in assessing obviousness and applying prior art references. See also In re Stencel, 828 F. 2d 751, 754, 4 U.S.P.Q. 2d 1071, 1073 (Fed. Cir. 1987).

In the instant application, the preambles are all "essential to particularly point out the invention defined by the claims." Each also contains limitations which "are necessary to give meaning to the claim and properly define the invention." As such they must be taken into account. When that is done, the unobviousness of the instant invention becomes manifest. A resource management system is very different from a project planner and because the two are so different, the latter does not render obvious the former.

As noted above and as discussed in the specification, the instant invention is resource driven, i.e., it is a tool to manage or schedule the utilization of related resources. By contrast, project planners like Time Line are event or activity driven, i.e., their purpose is to manage or schedule related events, not resources. Thus, project planners associate event with event and perhaps, as with Time Line, also resource with event, whereas the method and system of the instant invention relate numerous resources to one another. Accordingly, when the claim preambles call for planning or scheduling resources and for at least some of those resources to be related, one to another, they clearly differentiate the claimed subject matter from that which is taught in the Time Line reference.

In addition to the preamble, each of the claims contains specific limitations, all related to the resource-driven nature of the invention, which expressly and explicitly

distinguish them from that which is disclosed in the Time Line reference. Although it is believed that these distinctions were at least inherent in the claims as originally presented, claims 1, 2, 12 and 18 have been amended to make at least some of these distinctions even more clear.

These features, not even remotely suggested in the Time Line reference, give the instant invention capabilities far beyond those to which Time Line can be put. For example, the instant invention permits identification of different kinds of conflicts. One such conflict could result from an attempt to schedule a particular resource in two places at one time. Another, and entirely independent conflict could arise from an attempt to put a resource to a use for which it is unsuited. Time Line is able to signal only a timing conflict.

Further, the instant invention uses conflict indicators which not only signal the existence of a conflict, but also identify the nature of the conflict. Nothing even remotely similar can be found in Time Line.

Another novel feature is the ability simultaneously to display the utilization of multiple resources as well as to show relationships between at least some of those resources. Similarly, the status of utilization can also be displayed, as can the information in the data base about a given resource. None of these features or capabilities can be found in Time Line.

The combination of these features, or at least of some of them, as explained at page 19 lines 13-19 of the specification, gives the instant invention the ability to communicate multi-dimensional information on a two-dimensional screen. Project planners, of which Time Line is exemplary, are strictly two-dimensional.

Turning now to the particulars of the claims, each one calls for creating and/or storing a data base about at least some of the resources. Applicants have not been able to find any suggestion in the Time Line reference of a data base relating to any of the resources. While the Examiner asserts that "[t]he system allows a user to store information about resources and to use this information to assign resources . . .", applicants have been unable to find any such disclosure.

Not only do all the claims in the subject application call for the establishment of a data base about at least some of the resources, they also call for the establishment of temporal relationships between some of the resources. While not saying so explicitly, the Examiner seems to suggest that the "booking" of a resource in Time Line is analogous to the creation of a data base in the instant invention. That, however, is not so. The booking of a resource may be analogous to establishing a temporal relationship (although only with respect to an event, not with respect to any other resource, as called for by the claims), but there is nothing in Time Line that corresponds in any way or even remotely suggests establishing a data base about any resource.

In order more clearly to point out this distinction between the information in the data base on the one hand and the temporal relationships on the other, new express limitations have been added by amendment to independent claims 1, 2, 12 and 18. These amendments, which, because of claim dependencies, apply to all claims in the application, are believed to bring into even sharper focus than before at least one distinction over Time Time, which distinction, it is respectfully submitted, demonstrates that the differences between the instant invention and the Time Line reference are such that the subject matter as

a whole would not have been obvious.

Creating a data base containing information about some or all of the resources and then using that data base in the utilization planning and in the conflict identification operations is believed to be unique to the instant invention. It certainly is not something taught or rendered obviousness by anything in the Time Line reference. For this reason alone, all claims are believed to distinguish over Time Line and to be patentable.

Each claim also calls for the establishment of two classes of resources, primary and secondary. The Examiner argues that in Time Line, since tasks are labeled as "critical" or "non-critical", and since tasks involve use of resources, the resources must also be deemed "critical" or "non-critical". Having thus attached labels to the resources (labels which are not used in the Time Line reference itself), the Examiner proceeds to argue that these labels correspond to the instant invention's identifying of resources as "primary" and "secondary". It is respectfully suggested that the Examiner's logic does not follow. In fact, Time Line does not even classify tasks as "critical" and "non-critical". Rather, it determines a Critical Path and classifies tasks as being within or not within that Critical Path (p.19). The Critical Path is made up of a series of tasks or events which must be performed as scheduled. Those not in the Critical Path may be performed as time may be available.

Thus, "critical" is used to identify certain temporal relationships between related tasks. It has absolutely nothing to do with the resources. Evidence of this is found in the fact that while "critical" and "non-critical" are used throughout the Time Line reference, and while "resources" are also referred to throughout that reference, applicants have been unable to find

even a single reference to a resource as being either "critical" or "non-critical." Those terms are reserved solely for use with reference to a "Path" or to tasks within that "Path". It is respectfully suggested that the attempt first to infer from Time Line's disclosure the existence of "critical" and "non-critical" resources and then to try and analogize those classifications to the primary and secondary resources classifications of the instant invention is tantamount to forcing a square peg into a round hole.

Claim 2 calls for conflict indicia to identify impermissible utilization of resources. The Examiner asserts that "overbooking" in the Time Line reference corresponds to an impermissible use as referred to in Claim 2. However, the Examiner seems to have overlooked the fact that Claim 2 contains in addition to a limitation relating to temporal relationships, a separate one relating to the establishment of a data base. The impermissible use in Time Line referred to by the Examiner ("overbooking") is one arising out of an established temporal relationship. It does not arise as the result of a search of any data base, as called for by Claims 2. Indeed, in Time Line there is no data base to search and hence no data base which could give rise to a conflict.

In the rejection, the Examiner refers to Time Line's process of "Levelling." As applicants understand it, Time Line's "Leveling" merely adjusts the scheduling of events. If one event conflicts with another, or if a specified resource is not available, the timing of the involved event is delayed. In the instant invention, on the other hand, because of the existence of the database, much more can be done. For example, equivalency, at least for some purposes, between two or more resources, can be established in the database and, as a result, substitution of one resource for another can be made

automatically. It is not believed that Time Line has any such capability.

Claim 8 calls for the display of status indicia. Again, applicants do not believe that the Time Line reference teaches anything even remotely corresponding to this limitation or anything that would render its inclusion obvious. The Examiner's argument notwithstanding, Time Line neither teaches nor remotely suggests nor even vaguely hints at the use of status indicia.

With respect to claims 8-11 the Examiner asserts that because Resource Levelling in the Time Line reference "allows an update of schedules in view of changes in the actual use of [a] resource," these claims are unpatentable. Updating of schedules, however, is something very different from displaying the status of resource utilization by means of status indicia. As discussed in the paragraph bridging pages 20 and 21 of the instant specification, status indicia can alert the operator to the need for rescheduling, but the two are not at all the same. Status indicia can be displayed irrespective of the need to reschedule. Claims 8-11 call for actually displaying (or communicating) real, as contrasted with scheduled or proposed, utilization information. Such displays are depicted in Figs. 1A through 1E and are discussed at page 19, line 32, through page 20, line 29. Nothing even remotely analogous is found in the Time Line reference.

Claim 11 expressly calls for determining whether conflicts exist as a result of temporal relationships or as a result of information stored in the data base. Time Line, on the other hand, displays only conflicts which arise as a consequence of temporal relationships. It does not display conflicts that arise as the result of a use which is incompatible with the uses thereof permitted by the data base.

The Examiner has also taken the position that Claim 18 is not patentable because Time Line teaches updating of schedules as well as permitting the comparison of two schedules and the modification of one or the other as a result of said comparison. In making this rejection, however, the Examiner has overlooked a number of limitations in claim 18. Thus, claim 18 calls for (1) storing a data base of information about at least some of the resources, (2) establishing two sets of resources, (3) comparing a scheduled utilization of at least one resource with either another resource utilization or with information in the data base. None of these features is found in Time Line.

While the Examiner is correct that Time Line allows for reports showing how the schedules actually turned out (after the fact), as well as how the schedules looked as planned (before the fact), this is a far cry from teaching the display or communication of current status information, as required by claims 8-11 and 19-21. Neither of the Time Line reports referred to by the Examiner provides that kind of information. One report is entirely prospective and the other entirely retrospective. Neither, however, provides any information about the current status of resource utilization on an ongoing basis. One merely sets forth a plan for the future, and the other is an historical record of what happened at some time in the past. It is, therefore, respectfully suggested that the Examiner is wrong when she says that "[s]tatus indicators are available in Time Line's Actual vs. Planned Reports."

Claims 22-24 have been rejected because the use of real time clocks in computer systems is well known. Applicants agree that clock mechanisms are routinely used in computer applications. Indeed, Time Line itself makes provision for an Alarm Clock (pp. 22-23). Claims 22-24, however, do not merely call for a clock, they specify that the means for collecting

actual utilization information include clock means. Since Time Line makes no provision for collecting actual status information, its use of a clock is of no consequence insofar as claims 22-24 are concerned.

The Examiner has rejected claim 33 for obviousness because the Time Line "Gantt chart utilizes status indicators with graphics..." Claim 33, however, requires more. It calls for the concurrent display of graphical as well as textual information about the utilization of at least some resources. The Time Line Gantt chart displays no textual information about resources. With respect to resources, it merely identifies the existence of a conflict, but does not even identify the resource involved, much less provide textual information about that resource.

In rejecting Claim 34, the Examiner asserts that "as Time Line allows rescheduling of tasks (and thus resources), stored information about resources can be accessed." With all due respect, that is a non sequitur. In Time Line there is no provision for storing information about resources. Therefore, there is no stored information to be accessed. The Examiner is attributing to Time Line features and capabilities found only in the instant application. To do so is improper and the result of such an exercise cannot form the basis for rejection.

The original dependent claims are allowable for the reasons given with respect to the independent claims. In addition, a number of those dependent claims recite features which render them patentable in their own rights. Therefore, reconsideration of each of the original dependent claims is also respectfully solicited.

In addition to the original claims, all of which are believed to be patentable for the reasons given above, applicants have also added new claims 37-59. Each of these more

particularly points out and highlights features not found in the Time Line reference. Support for the new claims can be found in the specification as follows:

Claims	Support
37-41, 47, 50, 51, 49	p. 9 ln 29 - p. 10 ln 1 p. 13 ln 36 - p. 14 ln 1 p. 15 lns 12-26 p. 25 lns 12-19
42, 43, 54, 55	p. 15 ln 28 - p. 16 ln 18
44, 52, 56	p. 24 lns 18-31
45, 57	p. 13 lns 3 - p. 14 ln 4
46, 58	p. 29 lns 1 - 26
48, 49	p. 9 lns 10 - 29
53	p. 8 lns 6 - 8
60	p. 10 lns 23-36, p. 11 lns 25-34, p. 13 lns 3-6

It is respectfully submitted that none of these claims is either anticipated or rendered obvious by the Time Line reference. Claims 37-41, 47, 50, 51 and 59 call for, inter alia, the ability to communicate at least two different types of conflict indicia. Time Line teaches only one type.

Claims 42, 43, 54 and 55 call for the dynamic display of resource utilization in real time. Time Line, by contrast, teaches static displays, either prospective or historical. The Time Line displays are neither dynamic nor in real time.

Claims 45 and 57 calls for the ability to identify both real as well as apparent conflicts. Time Line is entirely silent as to apparent conflicts.

Claims 46 and 58 call for the ability to interrogate the data base and display information about a resource. Since Time Line fails to create a data base, there is none to interrogate, and no information therefrom to display.

Claims 48 and 49 specify that the data base have a permanent or semi-permanent component and a more transitory

component. Time Line does not teach any data base, permanent, transitory or otherwise.

Claim 53 calls for optical display means. Although that feature is undeniably shown in Time Line, since claim 53 is dependent from Claim 18, it is patentable for all the reasons given above with respect to claim 18.

Claim 60 requires that a determination be made as to whether a conflict exists as a result of the search of the data base, as well as to whether a conflict exists as a result of temporal relationships. Time Line, by contrast, determines only temporal conflicts.

Finally, the other references cited by the Examiner as being pertinent to applicants' disclosure have been carefully studied, but it is not believed that they, either separately or in combination, disclose or suggest the inventive concept of the present application as defined by the claims. Nor are they believed to disclose those features, as discussed above, which differentiate the instant invention from Time Line.

Accompanying this Amendment and Response, applicants submit a completed form showing the fee calculation to cover the newly added claims. A check in the amount of $186 to cover the fee for the additional claims is enclosed herewith. A second check, in the amount $28.00, is also enclosed to cover the one-month extension fee. In the event that the enclosed checks are insufficient to cover the costs, under 37 C.F.R. 116 or 117, please charge the deficiency to our deposit account number 06-1205.

In light of the foregoing amendments and remarks, it is submitted that all of the claims now in the application are

in condition for allowance. Therefore, early passage to issue is respectfully solicited.

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Group Art Unit 236
The Honorable Commissioner of Patents
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re: Serial No.: 096027
Filing Date: 09/10/87

NOTICE

Please be advised that any prior authorization to charge an issue fee under 37 C.F.R. 1.18 to Deposit Account 06-1205 is hereby revoked.

The Commissioner remains authorized to charge any fees which may be required during the entire pendency of this application under 37 C.F.R. 1.16 and 1.17, and to credit any overpayment, to Deposit Account No. 06-1205.

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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

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HAYES, G	RS

ART UNIT	PAPER NUMBER
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DATE MAILED: 06/27/89

☑ This application has been examined ☑ Responsive to communication filed on 1-23-89 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), — days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice re Patent Drawing, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, Form PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____

Part II SUMMARY OF ACTION

1. ☑ Claims 1-60 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☐ Claims _____ have been cancelled.

3. ☐ Claims _____ are allowed.

4. ☑ Claims 1-19, 26, 30-34, 37, 39-40, 42-44, 46, 48-51, 53-56, 60 are rejected.

5. ☑ Claims 20-25, 27-29, 35-36, 38, 41, 45, 47, 52, 57-58 are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed on _____, has been ☐ approved. ☐ disapproved (see explanation).

12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

Claims 14-17, 30-34, 50-51 and 59 include use of a function without recitation of means to perform the function. For example, claim 30 attempts to modify the system of claim 14 by use of graphical display for scheduling indicia. No means to provide this graphical display for indicia are included. For this reasons, the language of claims 30-34 is vague and indefinite.

Claims 1-19, 26, 34, 39, 40, 42-44, 46, 48, 50, 53-56, 59 and 60 are rejected under 35 U.S.C. 103 as being unpatentable over Class Scheduling in view of the Classifier CSL Scheduling.

Claim 1 is directed to a method of scheduling use of multiple related resources. The method comprises steps of (1) identifying resources as primary and secondary; (2) establishing time relationships between some of the resources; (3) storing resource information which is not a function of the above time relationships in a data base; (4) scheduling future use of the resources; (5) comparing scheduled resource use with information stored in the data base to detect any incompatabilities between the scheduled use and data stored; and (6) indicating the existence of the conflict.

Class Scheduling is a software package developed by CMA Micro Computer to aid school administrators in offering a schedule of classes for student selection. The system allows administrators to develop proposed

course schedules in order to detect any "suitability and conflicts" before schedule is finalized.

A resource is defined as a source of supply or support. The Examiner asserts that classes, teachers and rooms of schools are resources since they are used to help students obtain knowledge needed to become functioning members of society. Class Scheduling is therefore directed to a system for scheduling or planning future use of resources (i.e. classes). Means to construct proposed course schedules constitute scheduling means of claim 1; means to identify classes as required or electives constitute means to identify resources as primary (required) or secondary (electives); and means to determine if proposed schedules are suitable and without conflict constitutes means to determine if scheduled use of resources is compatible with stored resource information of claim 1. While not discussed in the available abstract, the Examiner asserts that information on courses such as title, content, prerequisites would be stored by the Class Scheduling software package.

One reason for storage of such information would be to more effectively accomplish a second objective of the Class Scheduling system, to assign students to classes offered by the school. In order to honor

student requests for a particular course, any scheduler, software or human, would check to determine if any necessary prerequisites had been met by the student.

The scheduler would therefore need access to information on course prerequisites in order to determine if the need to check student qualifications exist. The most logical manner of providing access to this information for a software package would be to store the data in memory. Use of a data base structure to store and retrieve data stored in memory is a design choice of available data storage and retrieval structures. In sum, it would be obvious to include in the Class Scheduling system, data concerning classes other than time of meeting. Storage of this data would constitute storage of resource information which is not a function of resource time relationships found in claim 1.

One possible conflict for which Class Scheduling would check would be to determine if a prerequisite for a course were being offered prior to offering the course itself. Other conflicts would be he availability of teachers. Teacher availability and course prerequisite data would be stored in memory and accessed to determine if any conflict existed in the proposed schedule. The Examiner asserts that when permitting the administrator to test proposed schedules,

the system would inform her of the results of her test (i.e., if a conflict exists or not). Means to indicate the existence of a conflict after a comparison of scheduled resource use (i.e., proposed schedules) and resource data stored (i.e., stored course data) would therefore exist.

If no conflict exists, a final master schedule would be constructed. This final schedule constitutes means to establish temporal relationships between resources.

CSL Scheduling by Chancery is a course scheduling program for use by school administrations. The program considers course prerequisites and teachers for course scheduling. In view of use by CSL of teacher and prerequisite data, the Examiner asserts that it would be obvious to make use of this data in the Class Scheduling system as previously discussed.

The Classifier, a third class scheduling software package, schedules students, classes, teachers and rooms. The Examiner asserts that if this capability were incorporated into the Class-Scheduling-CSL combination, data relating to teachers, rooms, etc. would be stored for access by the system.

Claim 1 is rejected for obviousness.

Claim 2 differs from claim 1 in that information stored in databases indicates permissable and

impermissable uses. The Examiner asserts that storage of prerequisite data constitutes permissable (i.e., course may be taken) uses and impermissable uses (i.e. course may not be taken). Claim 2 is rejected for obviousness.

Claims 3/1, 3/2 and 4/1, 4/2 recite means by which the user is alerted of a conflict. The Examiner asserts that beeps or other audible sounds of alarm (claims 3/1, 3/2) and lights (claims 4/1, 4/2) are means used prior to the date of Applicant's invention for indicating an alarm status. Conflict in course scheduling would cause a need to alert the user. Claims 3/1, 3/2, and 4/1, 4/2 are rejected for obviousness.

Claims 5-6 include steps of displaying conflict indicia on a display means. Class Scheduling and CLS are software packages implemented via use of a computer. Use of a display monitor with computer systems is a widely used method of human-machine interface. It would therefore be obvious to output any optical indicia of conflict on display means. Claims 5-6 are rejected for obviousness.

Claim 7 includes a step of displaying an indicia to represent scheduling of resource use. The Examiner asserts that display of course schedules constitutes display of schedule indicia. Claim 7 is rejected for obviousness.

Claim 12 is a system claim corresponding to method claim 1 and is rejected on the same basis.

Claim 13 includes display means. As discussed in the rejection of claims 3 and 4, use of a display monitor as input/output means is a design choice of readily available means. Claim 13 is rejected for obviousness.

Claim 14 recites subject matter found in claim 7 and is rejected on the same basis.

Claim 15 includes means to display conflict indicia. Use of display means is a design choice of readily available human-machine interface means. Claim 15 is rejected for obviousness.

Claims 16-17 recite use of scheduling indicia for primary and secondary resources as a function of time. Scheduling of classes for a particular times constitutes scheduling of primary (required) and secondary (elective) courses as a function time. Claims 16-17 are rejected for obviousness.

Claim 8 includes a step of obtaining information on actual resource use subsequent to its scheduled use and indicating the actual use as status indicia.

The Classifier, allows for add/drop of courses by students. The Examiner asserts that adding or dropping a course constitutes actual use or lack thereof

of a class. The number of students registered for a course would be updated to reflect this change. The Examiner asserts that the add/drop data (i.e., actual resource use) would be displayed by the system. Claim 8 is rejected for obviousness.

Claim 9 incorporates steps of determining if the actual use of a resource is inconsistent with any prior scheduled use and if so to reschedule the resource use.

The Examiner asserts that adding or dropping a course scheduled for a particular student. Once that add/drop is performed, the student schedule of resources would be updated. Claim 9 is rejected for obviousness.

Claim 10 includes a step of recording the actual resource use of claim 8. The Examiner asserts that add/drop data would be recorded by the Classifier. Claim 10 is rejected for obviousness.

Claim 11 includes in the method of claim 1 steps of obtaining information representing actual resource use; determining whether the actual use is incompatible with data stored in the database; and indicating the existence of any conflict.

CSL allows manual override of system constraints to reschedule students and teachers; Teachers are a resource also scheduled for use of CSL. If a teacher is for some reason unable to complete a

course for which she was scheduled, she would be replaced. The Examiner asserts that data indicating her failure to complete the term would constitute data concerning actual use of a resource. Manual override of the system might be necessary in order to reschedule a member of the facilty already scheduled for other courses. In any case, the replacement would have to be scheduled. This rescheduling of teachers would constitute a conflict with prior teacher use since the original teacher is no longer available. This scheduling would be confirmed by display to the user. Claim 11 is rejected for obviousness.

Claim 18 differs from claim 12 in that it includes means to collect information about actual use of a primary resource after its scheduled use and to modify at least one scheduled use to reflect changes between actual and scheduled uses.

As discussed in the rejection of claim 11, rescheduling of teachers (or rooms) after scheduled use of this room would involve obtaining information on actual resource after its scheduled use. Means to collect this data would be input and storage means of the computer system used to run Class Scheduling and CSL software packages. Rescheduling of teachers would "reflect" a change between actual and scheduled use of a primary (regular teacher as opposed to a temporary

substitute) resource. Means to modify at least one scheduled use would be portions of CSL which allows manual override and input of different teachers. The scheduled use of one teacher would thus be modified. Claim 18 is rejected for obviousness.

Claim 19 adds to the system of claim 18 means to input actual status of a primary resource use after the time of its scheduled use. The Examiner asserts that input of a substitute teacher, room or class for one originally scheduled constitutes input of actual status of a resource since this data indicates that the original resource has been replaced. Claim 19 is rejected for obviousness.

Claim 26 adds optical display means for displaying scheduling indicia, conflict indicia or status indicia. CSL and Class Scheduling are software packages implemented via use of a computer system. Use of a monitor to function as display means is widely known in computer based arts. If a proposed schedule is to be presented to the user, the Examiner asserts that one obvious means to output the data would be the monitor. This schedule would constitute scheduling indicia. If conflicts are found in proposed schedules, the Examiner further asserts that data indicating the existence of such conflict would be output to the user via use of the monitor. Claim 26 is rejected for obviousness.

Claim 34 (see the rejection of 34 as vague and indefinite) recites means for accessing information stored in the datbase of claim 13 and means to display the retrieved data.

The Examiner asserts a user would be allowed to retrieve data stored by CSL, Class Scheduling or the Classifier if only to make modifications. As previously discussed, such data would be relate to courses, teachers, rooms, etc. Claim 34 is rejected for obviousness.

Claim 37 recites the step of communicating at least two different types of conflict indicia. The Examiner asserts that different types of conflict indicia exist when two different types of conflicts exists. If Class Scheduling schedules use of teachers, classes, rooms, then conflict in any two of the above resources would result in generation of conflict indicia to indicate conflict in both resource. Thus, generation of two different types of conflict indicia exists. Claim 37 is rejected for obviousness.

Claim 39 recites the step of displaying status indicia. As discussed in the rejection of claim 5, Class Scheduling and CSL are implemented via use of a computer. Use of a display monitor to function as a man-machine interface is well known. If there was a conflict between scheduled uses of classes, teachers, or

rooms and nontemporal data such as class prerequisites the Examiner asserts that display of such data on a monitor would be a matter of design choice. Claim 39 is rejected for obviousness.

Claim 40 recites subject matter found in claim 37 and is rejection on the same basis.

Claim 42 recites display of use data for secondary resources and displaying a relationship between at least one of primary and secondary resources. As discussed in the rejection of claim 1, electives constitute secondary resources. The Examiner asserts that display of a course for use as an elective would constitute display of a secondary resource and implicitly display of the relationship with a primary (i.e. rigid

Claim 43 requires simultaneous display of primary and secondary resources. The Examiner asserts that display of required and elective courses by Class Scheduling or CSL would constitute simultaneous display of primary and secondary resources. Claim 43 is rejected for obviousness.

Claim 44 recites a step of dynamically displaying status information. The Examiner asserts that a final schedule is dynamically display once it is finalized and this schedule constitutes status data since it reflects the current use of classes, teachers and rooms, etc. Claim 44 is rejected for obviousness.

Claim 46 recites interrogation of the data base created in claim 5 to display resource information. The Examiner asserts that storage by CSL or Class Scheduling of data concerning class content, title, etc. would make obvious retrieval and display of this data since most software based systems which allow a user to store data allow its retrieval and display if only for modification purposes. Claim 46 is rejected for obviousness.

Claims 48-49 recites use of permanent or semi-permanent and transitory databases. The Examiner fails to understand how a database, an information storage structure, can be transistory. Claims 48-49 are rejected for obviousness.

Claim 50 is rejected on the same basis as claim 37.

Claim 53 includes in the system of claim 18, an optical display means. The Examiner asserts that a monitor of a computer system used to implement CSL or Class Scheduling would constitute optical display means. Claim 53 is rejected for obviousness.

Claims 54/13 and 54/53 include means to display information and the use of primary and secondary resources and to display a relationship between at least one primary and secondary resource. The Examiner

asserts that a primary resource would be a required course or a basic course and a secondary resource would be an elective course or an advanced course requiring the basic course as a prerequisite. A complete course schedule showing all course offered would show electives, required, basic and advanced courses. As in most course catalogs, the prerequisites of an advanced course would be identified or the course could merely be identified as Calculus. This identification would identify Calculus I as a prerequisite or basic course. Claims 54/13 and 54/53 are rejected for obviousness.

Claims 55/13 and 55/53 require simultaneous display of primary and secondary resources. As discussed above, the Examiner asserts that display of elective, required, basic and advanced courses constitutes simultaneous display of primary and secondary resources. Claims 55/13 and 55/53 are rejected for obviousness.

Claims 56/13, 56/13 and 58 are rejected on the same basis claims 44 and 46.

Claim 59 is rejected in view of the rejection of claim 37 and in view of the fact that if a conflict exists between teachers and another between courses offered CSL or Class Scheduling would inform the use of which resource was in conflict. Claim 59 is rejected for obviousness.

Claim 60 recites a step of determining if any scheduled use is incompatible with temporal relationships. The Examiner assert that scheduling of one room for use by two courses meeting at the same time would be detected by the Classifier and would be incompatible with the temporal relationship between the courses. Claim 60 is rejected for obviousness.

Claims 20-25, 27-29, 35-36, 38, 41, 45, 47, 52 and 57-58 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 30-33 and 51 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112 and to include all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gail Hayes whose telephone number is (703) 557-7117.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 557-2878.

G.O.H.
GH/MS

6/9/89

Allen MacDonald

ALLEN MACDONALD
EXAMINER
ART UNIT 236

TO SEPARATE, HOLD TOP AND BOTTOM EDGES, SNAP–APART AND DISCARD CARBON

FORM PTO-892 (REV. 3-78) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

NOTICE OF REFERENCES CITED

SERIAL NO.	GROUP ART UNIT	ATTACHMENT TO PAPER NUMBER
096027	236	8

APPLICANT(S): Rassman et al

U.S. PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE IF APPROPRIATE
	A						
	B						
	C						
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						

FOREIGN PATENT DOCUMENTS

*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS	PERTINENT SHTS. DWG	PERTINENT PP. SPEC.
	L								
	M								
	N								
	O								
	P								
	Q								

OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)

R "The Classifier", Mount Castor Industries, Inc. Abstract, citation from Microsearch File of Orbit, AN: 86-036077

S "Class Scheduling", CMA Micro Computer, Abstract, citation from Microsearch File of Orbit, AN: 86-035879

T "CSL Scheduling", Chancery Software LTd, Abstract citation from Microsearch File of Orbit, AN: 87-040814

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EXAMINER	DATE
Hayes	4-20-89

* A copy of this reference is not being furnished with this office action.
(See Manual of Patent Examining Procedure, section 707.05 (a).)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
RASSMANN, ET AL
Serial No.: 096,027
Filed: 9/10/87
For: METHOD FOR DINAMIC MANAGEMENT OF RESOURCES

Examiner:

Group Art Unit: 236

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

POWER TO INSPECT AND MAKE COPIES

Sir:

The undersigned attorney of record for Applicants hereby authorizes Troy M. Bronson and/or C. T. Tran to inspect and make copies of the above-identified application.

Respectfully submitted,

Anthony M. Zupcic

27,276

Registration No. 27,276

FITZPATRICK, CELLA, HARPER & SCINTO
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New York, New York 10172
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: G. Hayes
WILLIAM RASSMAN, ET AL.	)	
	:	Group Art Unit: 236
Serial No.: 096,027	)	
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	) :	October 13, 1989

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PETITION UNDER 37 C.F.R. § 1.136(a)

Sir:

Applicants petition the Commissioner of Patents and Trademarks to extend the time for response to the Office Action dated July 27, 1989 for one month from September 27, 1989 to October 27, 1989.

Submitted herewith is a check for $31.00 to cover the fee for the extension under 37 C.F.R. § 1.17. A Verified Statement claiming small entity status has been filed previously. Any deficiency in or overpayment of this fee should be charged or credited to Deposit Account No. 06-1205.

A duplicate copy of this sheet is enclosed.

FITZPATRICK, CELLA, HARPER & SCINTO
Attorneys for Applicants

By _____

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277 Park Avenue
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Examiner: G. Hayes
WILLIAM RASSMAN, ET AL.	Group Art Unit: 236
Serial No.: 096,027	
Filed: September 10, 1987	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	September 27, 1989

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OCT 26 1989
GROUP 230

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

MS
10/31/89

AMENDMENT AND
INFORMATION DISCLOSURE STATEMENT

Sir:

In response to the Official Action mailed June 27, 1989 (Paper No. 8), please amend the above-identified patent application as follows:

IN THE CLAIMS:

Please amend Claims 1-2, 5-6, 12-18, 26-28, 30-32, 43, 46, 53 and 56 as follows:

1. ((Twice amended) A method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

identifying some of said resources as being primary, and other resources as being secondary;

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establishing temporal relationships between at least some of said resources;

creating a data base of information about at least one of said resources, at least some of which information is independent of said temporal relationships between resources;

prospectively scheduling utilization of at least some of said primary resources and at least some of said secondary resources;

displaying, in graphical fashion, the prospectively scheduled utilization of at least some of said resources;

determining whether any of said scheduled utilizations of one of said resources is incompatible with any of the information in said data base; and

communicating, by means of conflict indicia, the existence of any said incompatible scheduled utilizations.

2. (Twice amended) The method of prospectively planning utilization of a multiplicity of related resources using a computer having a memory, including the steps of:

creating a data base of information about at least some of said resources, at least some of which data is independent of temporal relationships between resources;

including in said data base permissible and impermissible uses of at least some of said resources;

prospectively scheduling utilization of at least some of said resources;

displaying, in graphical fashion, the prospectively scheduled utilization of at least some of said resources;

searching said data base to determine if any of said scheduled utilizations constitutes an impermissible use; and

B1

communicating, by means of conflict indicia, said impermissible scheduled utilizations.

B2

2 ~~4~~ 5. (Amended) The method of claim 1 wherein said display is a transient [further comprising an] optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

17 14
~~6~~. (Amended) The method of claim ~~2~~ ~~10~~ wherein said display is a transient [further comprising an] optical display and wherein said communication of at least one of said conflict indicia is accomplished by having same appear on said display.

B3

25
~~12~~. (Twice amended) A system for prospectively planning utilization of a multiplicity of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory containing information about at least some of said resources, at least some of which information is independent of temporal relationships between resources;

a set designated as primary resources and a set designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

display means for displaying in graphical form, the prospectively scheduled utilization of at least some of said resources;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base, to detect incompatibilities; and

means for communicating, by use of conflict indicia, the existence of detected incompatibilities.

~~13.~~ 26 (Twice amended) The system of claim ~~12~~ 25 wherein said display means are characterized by being transient [further comprising means to display information].

~~14.~~ 27 (Amended) The system of claim ~~13~~ 26 wherein at least some of said scheduling information is made to appear[, by means of scheduling indicia,] in textual form on said display.

Claim 15, line 1, change "14" to --13--.

Claim 16, line 2, change "indicia reflect" to --information reflects--.

Claim 17, line 2, change "indicia incorporate" to --information incorporates--.

~~18.~~ 35 (Twice amended) A system for prospectively scheduling, periodic monitoring and managing utilization of a plurality of resources, at least some of which are interrelated, comprising:

a computer having a memory;

a data base stored in said memory, containing information about at least some of said resources, at least some of which information is independent of temporal relationships between resources;

a set designated as primary resources and a set designated as secondary resources;

scheduling means for prospectively scheduling utilization of at least some of said primary resources as a function of time;

display means for displaying in graphical form, the prospectively scheduled utilization of at least some of said resources;

means for communicating at least some of said prospectively scheduled utilization information through use of graphically displayed scheduling indicia;

means for comparing at least one of said scheduled utilizations with at least one other scheduled utilization or with information in said data base to detect incompatibilities;

means for communicating, by use of conflict indicia, the existence of detected incompatibilities;

means for collecting information about actual utilization of at least one of said primary resources subsequent to the first scheduled use of a resource; and

means for modifying at least one of said scheduled utilizations to reflect variances between said actual utilization and said prospectively scheduled utilization.

~~26~~ 50. (Amended) The system of claim ~~18~~ 35 wherein said display means are characterized by being transient in nature [further comprising optical display means for displaying at least one of said scheduling indicia or said conflict indicia].

~~27~~ 40. (Amended) The system of claim ~~20~~ 37 wherein said display means includes [further comprising optical display] means for displaying at least one of [said scheduling indicia,] said conflict indicia [indica] or said status indicia.

~~28~~ 49. (Amended) The system of claim ~~25~~ 48 wherein said display means includes [further comprising optical display] means for displaying at least one of [said scheduling indicia,] said conflict indicia or said status indicia.

~~30.~~ 32. (Amended) The system of claim [14] ~~12~~ 25 wherein at least some of said [scheduling] conflict indicia appear [in the form of a] on said graphical display.

~~31.~~ 31. (Amended) The system of claim ~~15~~ 28 wherein at least some of said [scheduling and] conflict indicia appear [in the form of a] on said graphical display.

B6

~~32.~~ 32. (Amended) The system of claim [28] ~~18~~ 35 wherein at least some of said actual utilization information appears on said [scheduling, conflict and status indicia appear in the form of a] graphical display.

~~43.~~ 43. (Amended) The method of claim ~~5~~ 42 wherein there is displayed simultaneously at least [some] one primary resource[s] and at least one secondary resource.

B7

Claim 46, line 2, after "about" insert --at least--.

~~53.~~ 53. (Amended) The system of claim ~~18~~ 44 wherein at least one of said conflict indicia is communicated by graphical display thereof [further comprising optical display means].

B8

Claim 56, line 2, change "optical" to --transient--.

Please add Claim 61 as follows:

~~61.~~ 47. The system of claim ~~22, 23 or 24~~ 46, 49 or 50 wherein said real time clock means is made to appear concurrently with said graphical display of the prospectively scheduled utilization of at least some of said resources.

B9

REMARKS

Following receipt of the Office Action mailed June 27, 1989, the subject application was carefully reviewed and the foregoing amendments were made and Claim 61 was added to take into account the Examiner's comments and to point out and claim more clearly, more completely and more definitively that which the inventors consider to be their invention. This application now contains Claims 1-61.

Initially, the Examiner indicates that Claims 20-25, 27-29, 35-36, 38, 41, 45, 47, 52 and 57-58 would be allowable if rewritten in independent form to include all the limitations of the base claims and intervening claims, and that Claims 30-33 and 51 would be allowable if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph, and to include all of the limitations of the base claims and intervening claim.

Applicants acknowledge with appreciation the indication that the above claims contain allowable subject matter. However, in view of Applicants remarks below and the traversal of the rejection of the base independent claims, Applicants request that the requirement that these claims be rewritten in independent form be held in abeyance.

Claims 14-17, 30-34, 50-51 and 59 were rejected for including a function without recitation of means for performing the function, in particular, Claims 30-34 were noted as being vague and indefinite.

These claims have been carefully reviewed and amendments have been made as deemed necessary to ensure that they conform fully to the requirements of 35 U.S.C. § 112, with special attention to the points raised in the Office Action. It is believed that the rejection of these claims has been obviated and reconsideration is therefore requested of each of these claims together with withdrawal of this objection.

Claims 1-19, 26, 34, 37, 39, 40, 42-44, 46, 48-50, 53-56, 59 and 60 were rejected under 35 U.S.C. § 103 as being unpatentable over the software program entitled Class Scheduling in view of The Classifier and CSL Scheduling software programs.

Of the claims under consideration, Claims 1, 2, 12 and 18 are in independent form. It is respectfully submitted that each of these independent claims, as amended, is allowable over the art of record, for at least the following reasons.

Amended independent Claim 1 is directed to a method of prospectively planning the utilization of related resources using a computer including the steps of: (1) identifying some of the resources as being primary and others as being secondary; (2) establishing temporal relationships between some of the primary resources; (3) creating a data base of information about the resources, some of which is independent of the temporal relationships; (4) prospectively scheduling the utilization of some of the primary resources and some of the secondary resources; (5) displaying with graphics the prospectively scheduled utilization of some of the resources; (6) determining whether any of the scheduled utilizations are incompatible with information stored in the data base; and (7) communicating the existence of any incompatible scheduled utilizations by means of conflict indicia.

Amended independent Claim 2, like Claim 1, is also directed to a method of prospectively planning the utilization of related resources using a computer, and as now amended also includes a step of displaying, in graphical fashion, the prospectively scheduled utilization of at least some of the resources.

Amended independent Claim 12 should not be considered as simply a "system claim corresponding to method Claim 1," as asserted by the Examiner at page 7 of the Office Action. It is respectfully suggested that the Examiner has overlooked the fact

that Claim 12 expressly calls for means for comparing at least one of the scheduled utilizations with at least one other scheduled utilization or with information in the data base, which is entirely different from the determining step recited in Claim 1. Nevertheless, Claim 12 as amended also includes a display means for displaying in graphical form the prospectively scheduled utilization of some of the resources.

Applicants appreciate the courtesies extended during the telephone conferences of July 17 and July 24, 1989 and the Examiner's attempts to obtain more complete documentation on the software programs cited. We regret that further documentation was not available in the Patent Office. Based simply on the abstracts, however, it appears that each program relates to school administration. The Class Scheduling abstract pertains to a program that "matches student course requests with courses and sections that are available" and permits schools to "test proposed course offerings to determine suitability and conflicts." The abstract for The Classifier relates to a program that "allows for setting the meeting time of any and all courses," can output student schedules, teacher schedules and room usage lists, and includes a program for examining course conflicts. The CSL Scheduling abstract merely pertains to a program that schedules students and considers prerequisites, co-requisites and multi-semester courses. Since receiving the Office Action additional information has been located by Dr. William Rassman, one of the Applicants, pertaining to Class Scheduling and a program called The Classifier II, a newer version of The Classifier that was referenced by the Examiner. (The documentation obtained by Dr. Rassman is described in his affidavit submitted herewith as Attachment "A").

As amended, Claims 1 and 2 both recite methods including a step of displaying, in graphical fashion, the prospectively scheduled utilization of at least some of the

resources, and Claim 12 sets forth a system including display means for displaying in graphical form, the prospectively scheduled utilization of at least one of said resource. Support for these limitations is found in the drawings and at pages 8, 11, 15-21 and 26-30. As noted by Dr. Rassman in his affidavit at page 3, The Classifier II does not appear to use graphics at all, much less to display prospectively scheduled utilizations of any of the resources using graphics. The Classifier II merely displays schedules as a list of course names using only text. For example, on page E-14 of Exhibit "2", note that in The Classifier II a schedule for a student is shown as simply a list of course names. In addition, Applicants have not found in the abstracts for the programs cited by the Examiner or in the material obtained by Dr. Rassman any teaching of the use of graphics in displaying the utilization of resources, as recited in Claims 1, 2 and 12. There also is no hint or suggestion of the need or desirability of substituting graphical displays for textual ones.

Moreover, with respect to Claims 1 and 12, and all other claims that recite primary and secondary resources, it is believed that the Examiner has incorrectly interpreted the terms "primary resource" and "secondary resource". It is respectfully suggested that the Examiner's assertion that "means to identify classes as required or electives constitute means to identify resources as primary (required) or secondary (electives)" is not correct. As disclosed in the specification at page 12, secondary resources can be scheduled for use during the use of and in conjunction with some of the primary resources. Applicants believe that a required course and an elective course do not have the attributes of primary and secondary resources, respectively, as described in the specification since they are not used at the same time in conjunction with each other.

Applicants could not find any suggestion or teaching in the above-noted abstracts or even in the documentation found by Dr. Rassman, of a system that had the capability of assigning secondary resources to be used in conjunction with primary resources. As stated by Dr. Rassman in the attached affidavit at pages 5-6, The Classifier II program "does not appear to permit constraints to be associated with places," rather "a 'pseudo student' is created that brings the constraints of a place with it." In Applicants' invention secondary resources can be assigned to be used in conjunction with primary resources.

Accordingly, it is respectfully submitted that independent Claims 1, 2 and 12 are patentable over the art of record.

Amended independent Claim 18 describes a system that not only performs prospective scheduling, but provides periodic monitoring and managing as well, and, like Claims 1, 2 and 12, Claim 18 describes a system that includes displaying means for displaying in graphical form the prospectively scheduled utilization of some of the resources. In addition, Claim 18 also includes means for communicating at least some of said prospectively scheduled utilization information using graphically displayed scheduling indicia and further sets forth that the periodic monitoring and managing can be accomplished by means for collecting information about the actual utilization of at least one of the primary resources subsequent to the first scheduled use of a resource.

The Examiner asserts, at page 9 of the Office Action, "that data indicating [a teacher's] failure to complete the term would constitute data concerning actual use of a resource." Applicants believe that this assertion is incorrect and note that in their invention the collecting means collects information about the actual utilization of resources on an

ongoing basis, that is, the collecting means actually monitors the current usage of a resource after all the events have been scheduled and while the events are being performed. The Examiner's example merely involves a user substituting one resource for another in a stored schedule, and does not encompass the concept of the system collecting information about resources while events are being performed or when resources are actually being used. Applicants have found no suggestion or teaching of this feature in any of the abstracts referenced and provided by the Examiner or in the documentation found by Dr. Rassman.

Moreover, Applicants have not found in the above-noted abstracts or even in the documentation found by Dr. Rassman any teaching or suggestion of displaying means for displaying in graphical form the prospectively scheduled utilization of resources or means for communicating at least some of said prospectively scheduled utilization information using graphically displayed scheduling indicia. Therefore, it is respectfully submitted that Claim 18 is patentable over the art of record.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, as described further below, the individual consideration or reconsideration, as the case may be, of the patentability of each on its own merits is respectfully requested.

Closely related to the feature of determining actual utilization of resources, as recited in Claim 18 discussed above, is the feature of automatic conflict resolution. Dependent Claims 9 and 29 are directed to automatically altering or rescheduling the scheduled utilizations in response to the

detection of incompatibilities in proposed or actual utilizations. As noted by Dr. Rassman in his affidavit at pages 4-5, there is no suggestion or teaching of automatic conflict resolution found in The Classifier II manual, and Applicants have found no suggestion or teaching of this feature in any of the abstracts cited by the Examiner. The Examiner has already indicated allowability of claim 29. The same indication is requested for claim 9.

Some of the other dependent claims that are directed to the actual utilization of resources include: Claims 8, 10, 11, 19-21 and 23-24 (allowability of claims 20, 21, 23 and 24 already having been indicated), which are directed to inputting and collecting information regarding the actual utilization of resources, and comparing the actual utilization with the prospectively scheduled utilization; and Claim 32, which is directed to displaying actual utilization information on the graphical display. As for the detection of incompatibilities: dependent Claim 60 sets forth a step of determining whether any of the scheduled utilizations are incompatible with any of the temporal relationships, while, dependent Claim 59 sets forth that at least two different kinds of incompatibilities can be detected and that some of the conflict indicia identify the nature of the incompatibility. Applicants have found no suggestion or teaching of any of these features in the abstracts cited by the Examiner or in the documentation found by Dr. Rassman.

New Claim 61 is directed to a system wherein the real-time clock means appears concurrently with the graphical display of the prospectively scheduled utilization of some of the resources. Support for this claim is found at pages 20 and 27 of the specification and in the drawings, especially Figure 7. Applicants have found no suggestion or teaching of this feature in the cited abstracts or the documentation located by Dr.

Rassman. In fact, Applicants have not found any suggestion or teaching of real-time clock means at all, in any of the art of record. For this reason alone, Claims 22-24, 44, 52 and 56 are patentable. Of this group, however, only claims 22-24 and 52 have been indicated as being allowable. The same is respectfully requested as to claims 44 and 56.

Applicants have also not found any teaching or suggestion in the art of record of the limitations of Claims 42 and 54, which call for the simultaneous display of utilization information about primary and secondary resources, together with a display of the relationship between them.

Since the cited references do not teach the use of graphical displays for reflecting resource utilization, obviously, they also fail to teach the display of textual information together with those graphical displays. Claim 14, which calls for this feature, is therefore patentable.

As a further refinement, Claims 34, 46 and 58 (only claim 58 having been deemed allowable) call for the ability to interrogate the data base and display the information about one of the resources which is stored therein. None of the cited references is believed to have such a capability.

Pertaining to the display or communication of conflict information, Claims 15, 30-31 and 53 recite that conflict indicia can appear on the graphical display; Claims 37, 40, 47 and 50 (only claim 47 having been deemed allowable) recite that at least two types of conflict indicia can be communicated or displayed; Claims 38, 41 (both deemed allowable) and 51 set forth that one of the conflict indicia can identify temporal conflicts while another identifies impermissible uses. Applicants respectfully submit that the art of record does not suggest displaying at least two different types of conflict indicia. In fact, as indicated by Dr. Rassman in his affidavit at pages 3-4, "'The Classifier II' does not appear to use any

graphics for conflict reporting, but appears to merely print a report in a special format that includes a count of conflicts which indicates that a 'slot is full' and overbooked by some number." The report shown at page A2-1 of Exhibit "2" merely shows one type of conflict, and does not appear to suggest that there could be different types of conflicts as asserted by the Examiner.

Some of the other dependent claims include limitations calling for the display of still another kind of indicia, namely status indicia. For example, Claim 39 includes a step of displaying status indicia and Claims 52 (deemed allowable) and 56 set forth means for dynamically displaying the status of utilization of resources in real time using status indicia. No suggestion or teaching of the display of status indicia, as differentiated from conflict or scheduling indicia, has been found by the Applicants in the art of record.

Concerning the display itself, dependent Claims 5-6, 13, 26 and 56, as amended, further set forth that the display is transient and, in particular, Claim 44 calls for the dynamic display of information reflecting status information in real time. Support for these amendments is found at page 24 of the specification. In addition, note that dependent Claims 48 and 49 set forth that the data base includes permanent, semi-permanent and transitory data bases. At page 13 of the Office Action, the Examiner states that she fails to understand how a data base can be transitory. Applicants refer the Examiner to page 9 of the specification, wherein a "transitory data base" is described as a data base in which stored data is frequently changed. Applicants respectfully submit that neither transient and dynamic displays, nor transitory data bases for storing data that is frequently changed are suggested or taught in the abstracts or the documentation identified by Dr. Rassman.

In summary, Applicants could not find any teaching or suggestion of any of the above noted subject matter, as claimed by the dependent claims, in the limited amount of information provided in the abstracts of the cited references or in the documentation found by Dr. Rassman.

Finally, the other art of record has been carefully studied, but it is not believed that they, either separately or in combination, disclose or suggest the inventive concepts of the present application as defined by the claims. Nor are they believed to disclose those features, as discussed above, which differentiate the instant invention from the abstracts cited by the Examiner or the additional documentation identified by Dr. Rassman.

Therefore, all of the claims are believed patentable over the art of record.

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. § 1.56, Applicants cite, as being potentially material to the examination of the present application, the documentation submitted herewith pertaining to Class Scheduling and The Classifier II program. Both of these documents are annexed to and described and discussed in Dr. Rassman's affidavit, also submitted herewith.

Even though the Rassman documentation is not believed by the Applicants to be prior art, it is respectfully requested that the above information be considered by the Examiner in order to aid in understanding the other references cited by the Examiner.

CONCLUSION

In light of the foregoing amendments and remarks, Applicants respectfully submit that all of the claims now in the

application are in condition for allowance. Therefore, early passage to issue is respectfully solicited.

FITZPATRICK, CELLA, HARPER & SCINTO
Attorneys for Applicants

By _____
Stevan J. Bosses
Registration No. 22,291
277 Park Avenue
New York, New York 10172
(212) 758-2400

20nn.ame/jc

MAIL ROOM OCT 16 1989 PATENT TRADEMARK OFFICE

924.1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: G. Hayes
WILLIAM RASSMAN, ET AL.	)	
	:	Group Art Unit: 236
Serial No.: 096,027	)	
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	)	
	:	

RECEIVED
OCT 26 1989
GROUP 230

STATE OF CALIFORNIA	)	
	:	ss.:
COUNTY OF	)	
	:	

AFFIDAVIT OF DR. WILLIAM RASSMAN

Dr. William Rassman, being duly sworn, deposes and says:

1. I am a named and joint inventor of the invention described and claimed in U.S. Patent Application Serial No. 07/096,027 entitled "METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES" (hereinafter the "'027 Application") filed on September 10, 1987.

2. In connection with the prosecution of the '027 Application, I received and have studied a copy of an Office Action dated June 27, 1989 together with a Notice of References Cited (Form PTO-892) and a copy of three abstracts, one abstract for each reference cited by the Examiner in the Office Action.

3. During my review of the Office Action and the limited amount of information provided in the abstracts for each reference, I noticed that each abstract pertained to a software program for school administration. The three programs cited by the Examiner were "The Classifier", "Class Scheduling" and "CSL Scheduling". Unfortunately, due to the limited amount of information in the abstract on each program it was impossible for me to determine precisely how each program operated or to identify with particularity and specificity the features and functions provided by each program. However, based on my review of the information in each abstract, I believe that none of the references cited by the Examiner teach or suggest the features of our invention as claimed.

4. On information and belief, my attorney contacted the Examiner to request that additional information be provided for each of the software programs cited in the Office Action of June 27, 1989, and was informed that the Patent Office did not have any additional information.

5. In an effort to determine whether the programs themselves include the teachings and features which

the Examiner finds suggested by the abstracts, in July of 1989, I initiated a search for more complete documentation on the cited software programs. I attempted to contact the companies that produce each program in order to obtain additional information. In the end, I was only able to obtain some additional documentation relating to the "Class Scheduling" program and "The Classifier II" program. "The Classifier II" appears to be a more recent version of "The Classifier" program cited by the Examiner. A copy of the documentation pertaining to "Class Scheduling" and a manual for "The Classifier II" are included herewith as Exhibits "1" and "2", respectively.

6. "The Classifier II" does not appear to use graphics to display prospectively scheduled utilizations of any resources, or display any resource information using graphics, as performed by our invention. "The Classifier II" appears to merely print a schedule as a list of course names using only text. An example of such a schedule printed by "The Classifier II" for a student is shown on page E-14 of Exhibit "2".

7. "The Classifier II" also does not appear to report conflicts graphically or to report them on a graphical display, but appears to merely print a report in a special format that includes nothing more than a count of the number of conflicts. This is done simply by indicating that a "slot is full" and overbooked by some number. In addition, it appears that "The Classifier II" can only react to one type

of conflict. Since I have not found any suggestion or teaching in "The Classifier II" material suggesting a capability of handling different types of conflicts, I strongly suspect that the earlier version, "The Classifier", was similarly deficient. Accordingly, I believe that the Examiner's suggestion to the contrary is incorrect.

8. "The Classifier II" simply rejects a schedule when a conflict occurs, rather than performing a resolution of the conflict. "The Classifier II" does appear to count the number of conflicts that occur and create a "conflict matrix", like that shown at page A2-1 of Exhibit "2", but that would not aid a user or computer in determining the resource substitutions that could be taken from a group of suitable similar resources. In contrast, some of the conflicts in the instant invention may be identified from a data base while generating the schedule, and with that information, the system can automatically "fix" the problem by automatically substituting another resource during scheduling. In "Class Scheduling", I have not found any indication that the program will automatically "fix" a conflict problem after it has been identified by the system. This would seem to be confirmed by reference to "The Classifier II" manual, where it says that the "conflict matrix" that can be printed by the system is not even used when generating a schedule:

> Although the complete conflict matrix is not used in generating the schedule, it is sometimes useful in fine tuning the schedule in order to achieve a more perfect balance. Program A2 lets the user print the complete conflict matrix.

(Exhibit "2", page 5.) To avoid conflicts when using "The Classifier II" the user must manually enter a request to have the conflict separated by fooling the system using "pseudo students", described below. (Exhibit "2", pages E-8 and E-9.)

9. "The Classifier II" also does not appear to have the ability to interrogate a data base and display the information about a resource, as claimed and performed by our invention. "The Classifier II" can print a prepared schedule, which is simply a list of the classes assigned to a particular student, but this is entirely different from the operation of accessing a data base of resource information and displaying information about one of the resources. "The Classifier II" documentation does not even appear to suggest accessing a data base having resource information and displaying the retrieved resource information.

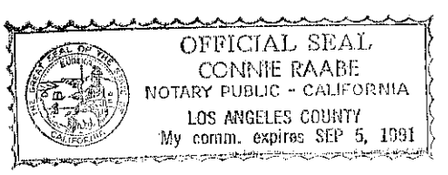
10. Another limitation of "The Classifier II" is that it does not appear to permit constraints to be associated with places. Instead, it creates a "pseudo student" that brings the constraints of a place with it. (Exhibit "2", page E-5.) This is different from the instant invention because in our system, scheduled events can bring with them the resource constraints that are necessary to

complete the event. With that information, the availability of resources can be matched to the constraints of a scheduled event before scheduling the event. In addition, in the system each constraint stands on its own and a single resource can have constraints as well.

Dr. William Rassman

Subscribed and sworn to
before me this 5th day
of October, 1989.

Connie Raabe
Notary Public



21nn.aff/kvf

UNITED STATE PARTMENT OF COMMERCE
Patent and Trac rk Office
Address: COMM. SSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
07/096,027	09/10/87	RASSMAN W	924.1

STEVEN J. BOSSES
FITZPATRICK, CELLA, HARPER & SCINTO
277 PARK AVENUE
NEW YORK, NY 10172

EXAMINER	
ART UNIT 236	PAPER NUMBER 12

DATE MAILED: 02/23/90

NOTICE OF ALLOWABILITY

PART I.

1. ☑ This communication is responsive to the amendment filed 10-16-89.
2. ☑ All the claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice Of Allowance And Issue Fee Due or other appropriate communication will be sent in due course.
3. ☐ The allowed claims are 1-61.
4. ☐ The drawings filed on _____ are acceptable.
5. ☐ Acknowledgment is made of the claim for priority under 35 U.S.C. 119. The certified copy has [_] been received. [_] not been received. [_] been filed in parent application Serial No. _____, filed on _____.
6. ☐ Note the attached Examiner's Amendment.
7. ☐ Note the attached Examiner Interview Summary Record, PTOL-413.
8. ☐ Note the attached Examiner's Statement of Reasons for Allowance.
9. ☐ Note the attached NOTICE OF REFERENCES CITED, PTO-892.
10. ☐ Note the attached INFORMATION DISCLOSURE CITATION, PTO-1449.

PART II.

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" indicated on this form. Failure to timely comply will result in the ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

1. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
2. ☑ APPLICANT MUST MAKE THE DRAWING CHANGES INDICATED BELOW IN THE MANNER SET FORTH ON THE REVERSE SIDE OF THIS PAPER.
   a. ☐ Drawing informalities are indicated on the NOTICE RE PATENT DRAWINGS, PTO-948, attached hereto or to Paper No. _____. CORRECTION IS REQUIRED.
   b. ☐ The proposed drawing correction filed on _____ has been approved by the examiner. CORRECTION IS REQUIRED.
   c. ☐ Approved drawing corrections are described by the examiner in the attached EXAMINER'S AMENDMENT. CORRECTION IS REQUIRED.
   d. ☑ Formal drawings are now REQUIRED.

Any response to this letter should include in the upper right hand corner, the following information from the NOTICE OF ALLOWANCE AND ISSUE FEE DUE: ISSUE BATCH NUMBER, DATE OF THE NOTICE OF ALLOWANCE, AND SERIAL NUMBER.

Attachments:

- _ Examiner's Amendment
- _ Examiner Interview Summary Record, PTOL-413
- _ Reasons for Allowance
- _ Notice of References Cited, PTO-892
- _ Information Disclosure Citation, PTO-1449
- _ Notice of Informal Application, PTO-152
- _ Notice re Patent Drawings, PTO-948
- _ Listing of Bonded Draftsmen
- _ Other

Jerry Smith
JERRY SMITH
SUPERVISORY PATENT EXAMINER
ART UNIT 236

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: Box ISSUE FEE
COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

STEVEN J. BOSSES
FITZPATRICK, CELLA, HARPER & SCINTO
277 PARK AVENUE
NEW YORK, NY 10172

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

☐ Note attached communication from the Examiner
☐ This notice is issued in view of applicant's communication filed _____

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT		DATE MAILED
07/096,027	09/10/87	061	HAYES, G	236	02/23/90

First Named Applicant	RASSMAN,	WILLIAM R.

TITLE OF INVENTION: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

	ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2	924.1	364-401.000	D20	UTILITY	YES	$310.00	05/23/90

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY Status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the Status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or

B. If the Status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B of this notice should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by a charge to deposit account, Part B should be completed and returned. If you are charging the ISSUE FEE to your deposit account, Part C of this notice should also be completed and returned.

III. All communications regarding this application must give series code (or filing date), serial number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Patents issuing on applications filed on or after Dec. 12, 1980 may require paym maintenance fees.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV 12-88)(OMB Clearance is pending)

310.00 242

PART B - ISSUE FEE TRANSMITTAL

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 2 through 6 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, the Patent, advanced orders and notification of maintenance fees will be mailed to addressee entered in Block 1, unless you direct otherwise, by: (a) specifying a new correspondence address in Block 1 below; or (b) providing the PTO with a separate "FEE ADDRESS" for maintenance fee notifications with the payment of Issue Fee or thereafter. **See reverse for Certificate of Mailing.**

APR 25 1990 PATENT & TRADEMARK OFFICE

1. CORRESPONDENCE ADDRESS	2. INVENTOR(S) ADDRESS CHANGE (Complete only if there is a change)
STEVEN J. BOSSES FITZPATRICK, CELLA, HARPER & SCINTO 277 PARK AVENUE NEW YORK, NY 10172	INVENTOR'S NAME Street Address City, State and ZIP Code CO-INVENTOR'S NAME Street Address City, State and ZIP Code ☐ Check if additional changes are on reverse side

SERIES CODE/SERIAL NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT		DATE MAILED
07/096,027	09/10/87	061	HAYES, G	236	02/23/90

First Named Applicant: [illegible], WILLIAM R.

TITLE OF INVENTION: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES

	ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE
2	924.1	364-401.000	D20	UTILITY	YES	$310

3. Further correspondence to be mailed to the following:

4. For printing on the patent front page, list the names of not more than 3 registered patent attorneys or agents OR alternatively, the name of a firm having as a member a registered attorney or agent. If no name is listed, no name will be printed.
1 FITZPATRICK, CELLA
2 HARPER & SCINTO
3

DO NOT USE THIS SPACE

080 04/25/90 07096027 1 242 310.00 CK
G 11227 04/27/90 07096027 06-1205 110 501 15.00CH

5. ASSIGNMENT DATA TO BE PRINTED ON THE PATENT (print or type)
(1) NAME OF ASSIGNEE:
IntelliMED Corporation
(2) ADDRESS: (City & State or Country)
2125 Center Ave, Fort Lee, N.J. 07024-5859
(3) STATE OF INCORPORATION, IF ASSIGNEE IS A CORPORATION
Delaware

A. ☐ This application is NOT assigned.
☒ Assignment previously submitted to the Patent and Trademark Office.
☐ Assignment is being submitted under separate cover. Assignments should be directed to Box ASSIGNMENTS.

PLEASE NOTE: Unless an assignee is identified in Block 5, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

6a. The following fees are enclosed:
☒ Issue Fee ☐ Advanced Order - # of Copies _____ (Minimum of 10)

6b. The following fees should be charged to: DEPOSIT ACCOUNT NUMBER 06-1205 (Enclose Part C)
☐ Issue Fee ☒ Advanced Order - # of Copies Ten (10) (Minimum of 10)
☐ Any Deficiencies in Enclosed Fees

The COMMISSIONER OF PATENTS AND TRADEMARKS is requested to apply the Issue Fee to the application identified above.

(Signature of party in interest of record) [signature] 4,

NOTE: The Issue Fee will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the Patent and Trademark Office.

TRANSMIT THIS FORM WITH FEE-CERTIFICATE OF MAILING ON REVERSE

PTOL-85B (REV 12-88)(OMB Clearance is pending)

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	) :	Examiner: G. Hayes
WILLIAM RASSMAN, ET AL.	) :	Group Art Unit: 236
Serial No.: 096,027	) :	Batch No.: D20
Filed: September 10, 1987	) :	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	) :	March 15, 1990

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

LETTER TRANSMITTING DRAWINGS

Sir:

Transmitted herewith are nine sheets of formal drawings to be substituted for the corresponding drawing sheets presently on file in the above-identified application.

Applicants' undersigned attorney may be reached by telephone in New York at (212) 758-2400. All correspondence should continue to be directed to our below listed address.

FITZPATRICK, CELLA, HARPER & SCINTO
Attorneys for Applicants

By _____
Stevan J. Bosses
Registration No. 22,291
277 Park Avenue
New York, New York 10172

076027

4927743

FIG. 1.

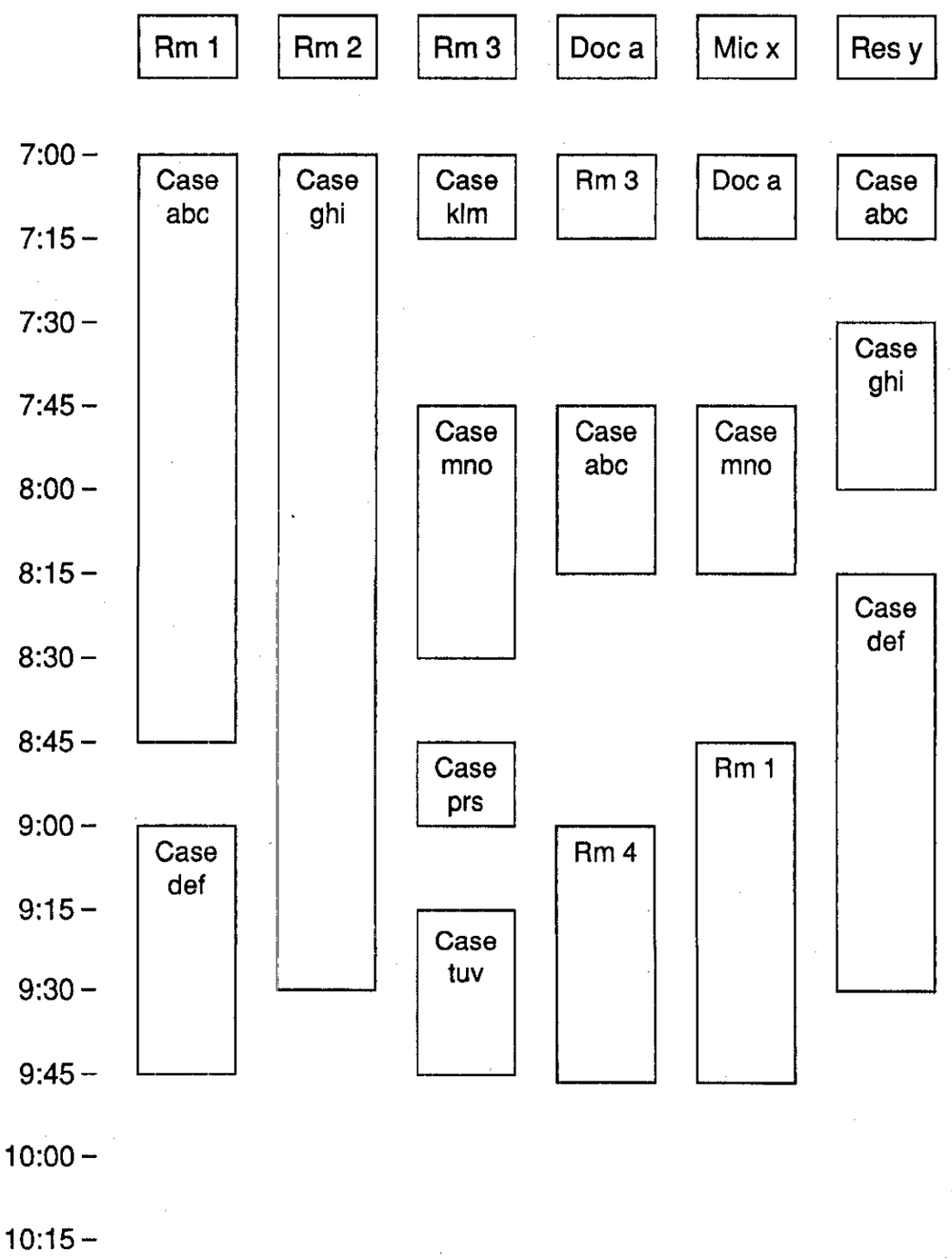


FIG. 1A.

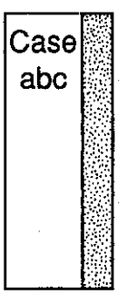


FIG. 1B.

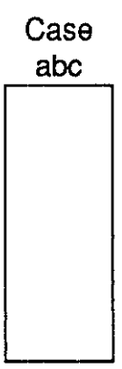


FIG. 1C.

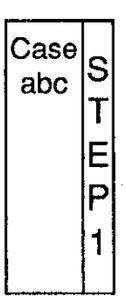


FIG. 1D.

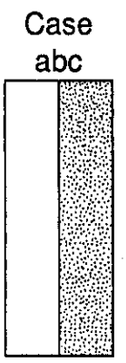


FIG. 1E.

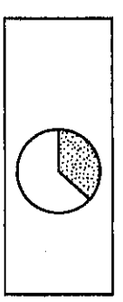
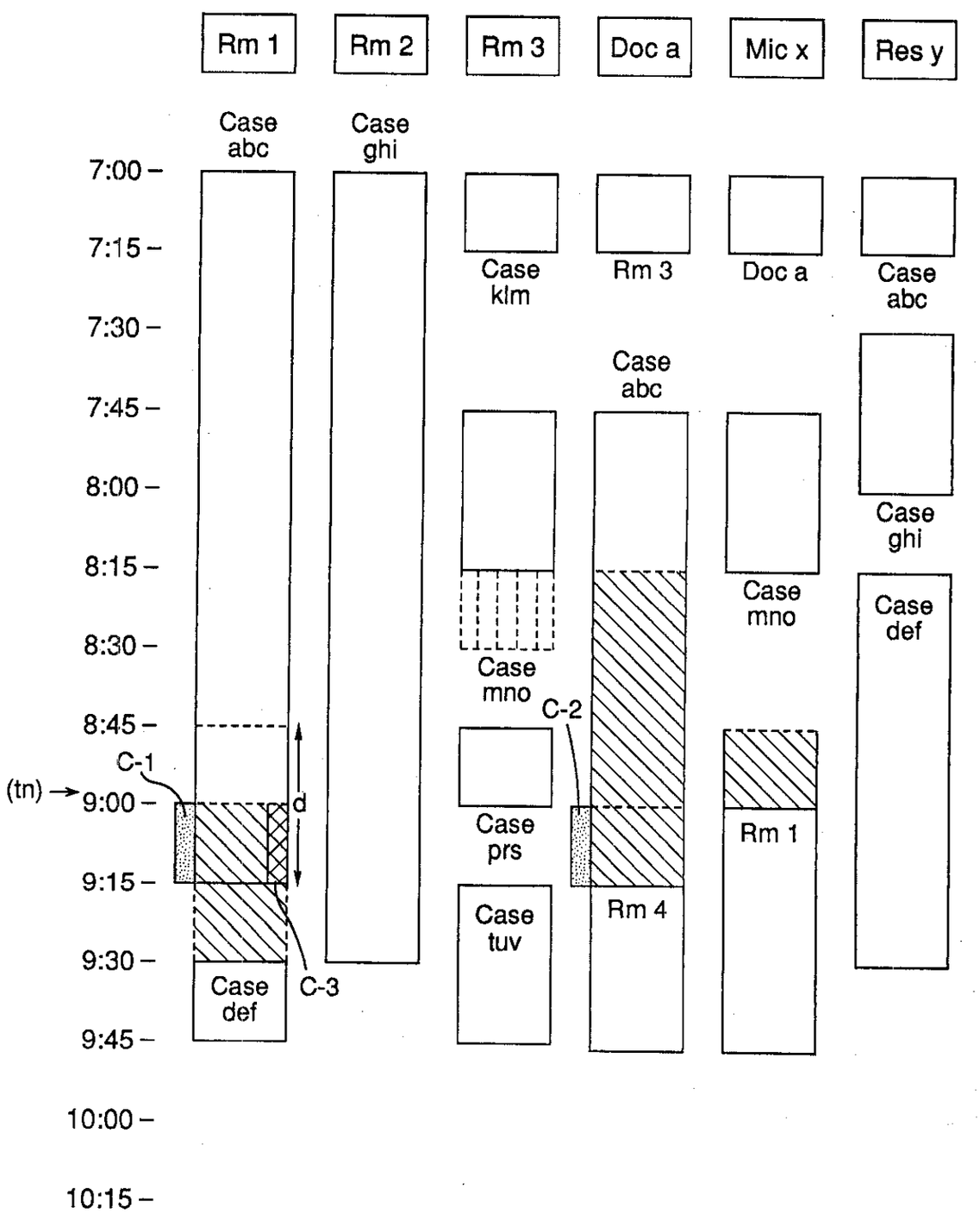


FIG. 2.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Rm 2
Rm 3
Doc a
Mic x
Res y
Case abc
Case ghi
Case klm
Rm 3
Doc a
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Case mno
Case mno
Case def
Case prs
Case tuv
Rm 4
Rm 1
Case def
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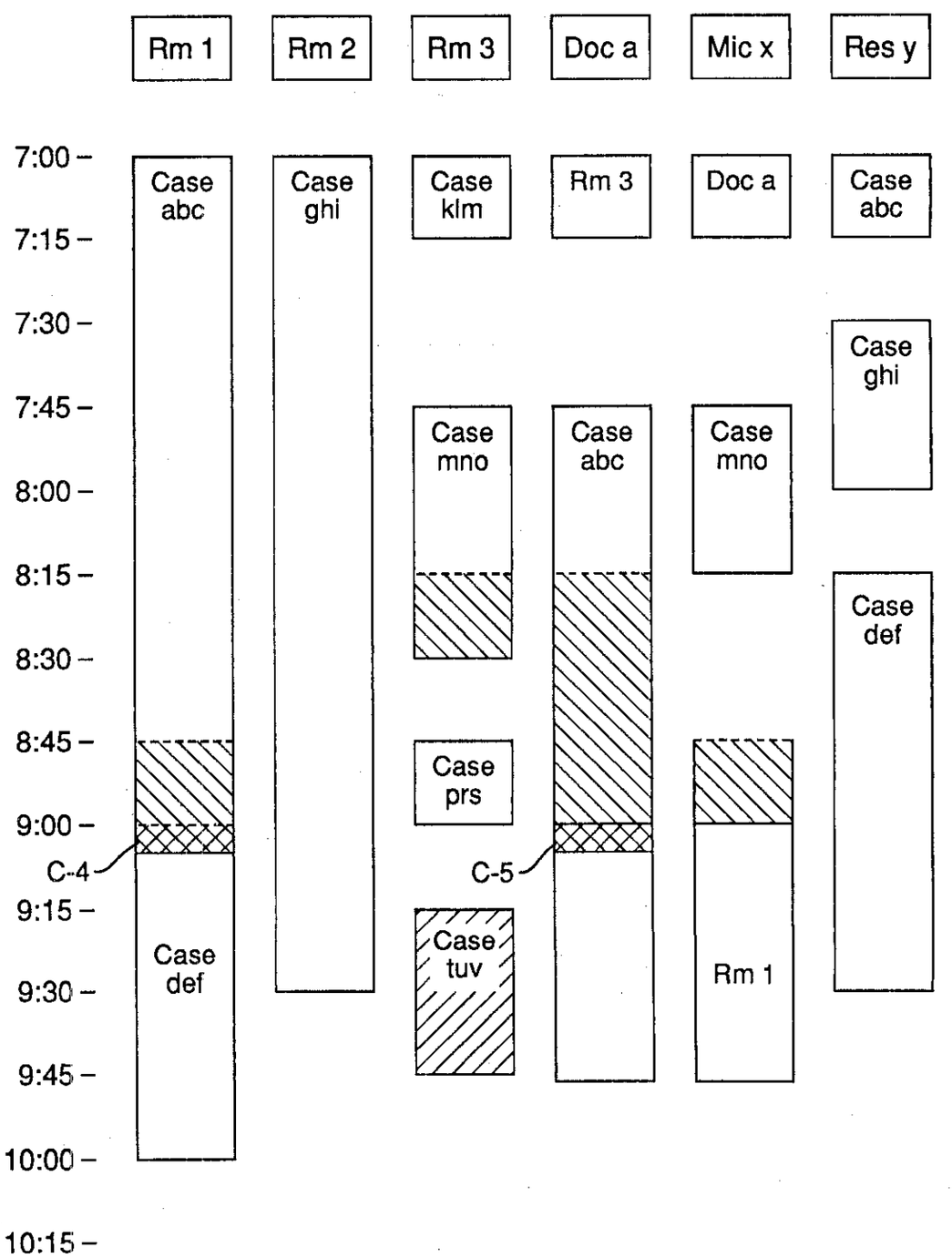
(tn)
C-1
C-2
C-3
d

FIG. 3.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Rm 2
Rm 3
Doc a
Mic x
Res y
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9:45
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10:15
Case abc
Case def
Case ghi
Case klm
Case mno
Case prs
Case tuv
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Doc a
Case mno
Rm 1
Case abc
Case ghi
Case def
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C-5

FIG. 4.

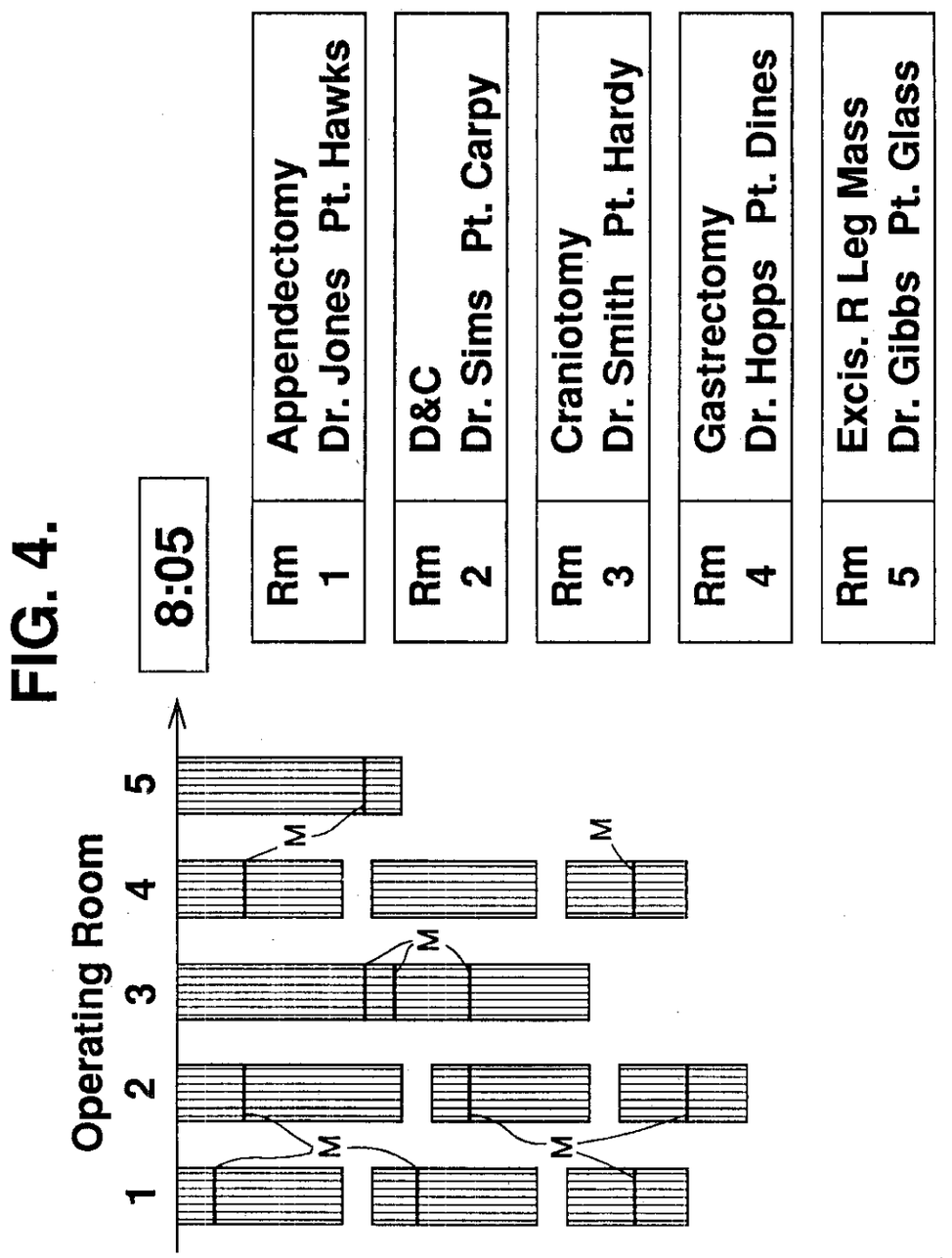
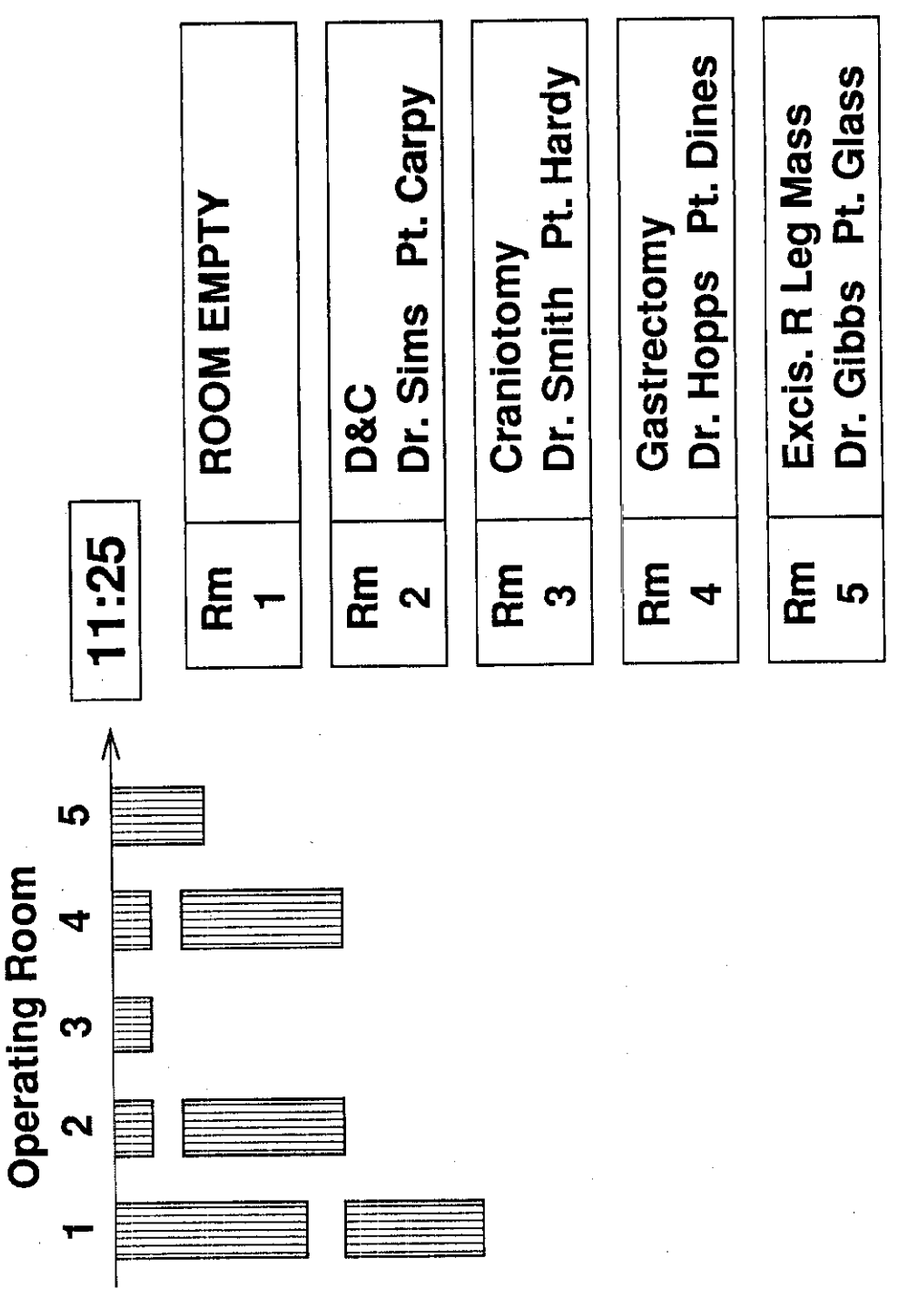

8:05
Rm 1 Appendectomy Dr. Jones Pt. Hawks
Rm 2 D&C Dr. Sims Pt. Carpy
Rm 3 Craniotomy Dr. Smith Pt. Hardy
Rm 4 Gastrectomy Dr. Hopps Pt. Dines
Rm 5 Excis. R Leg Mass Dr. Gibbs Pt. Glass
Operating Room
1
2
3
4
5
M

FIG. 5.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D&C
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Rm 3
Craniotomy
Dr. Smith Pt. Hardy
Rm 4
Gastrectomy
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Rm 5
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Operating Room
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FIG. 6.

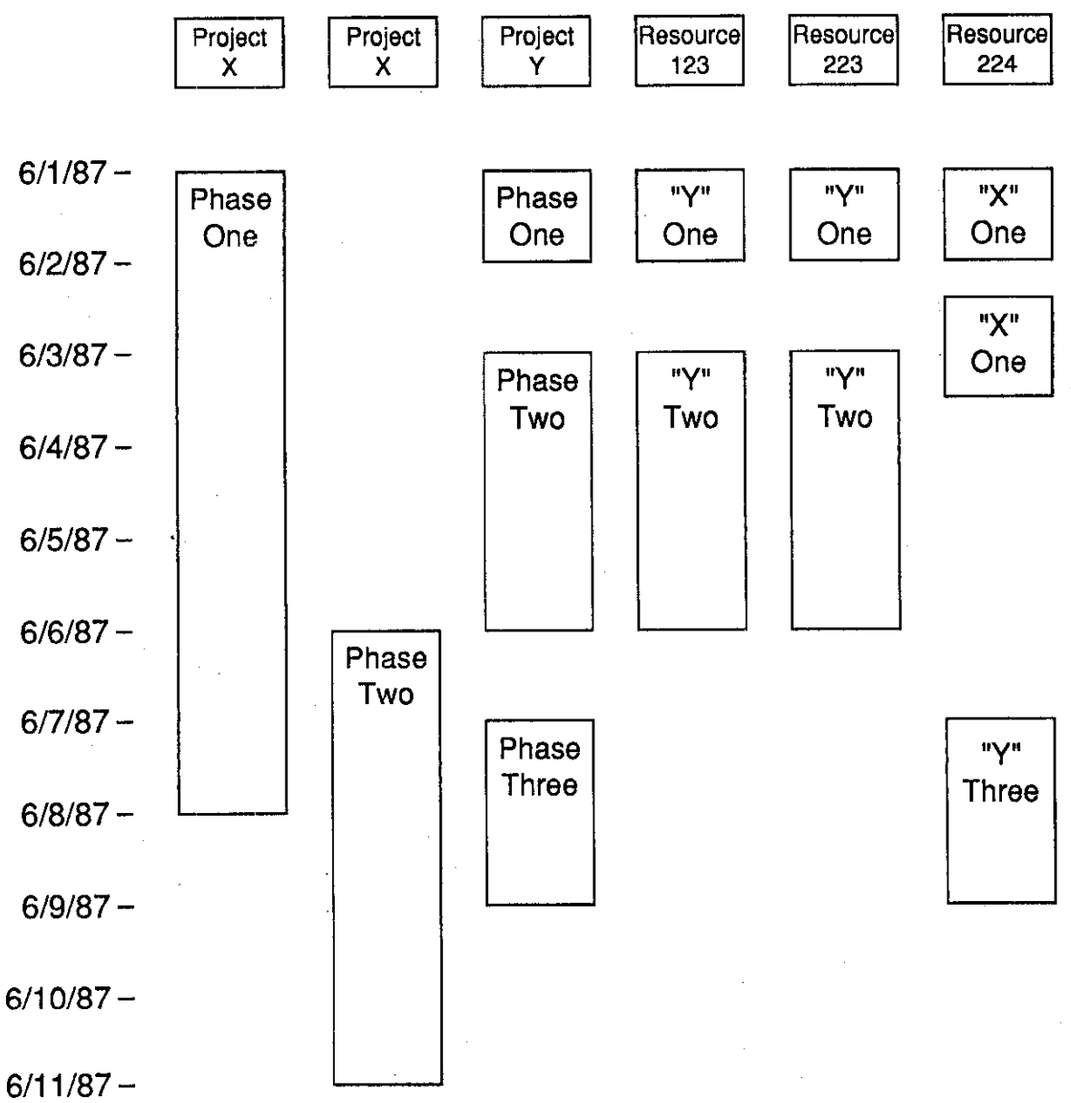
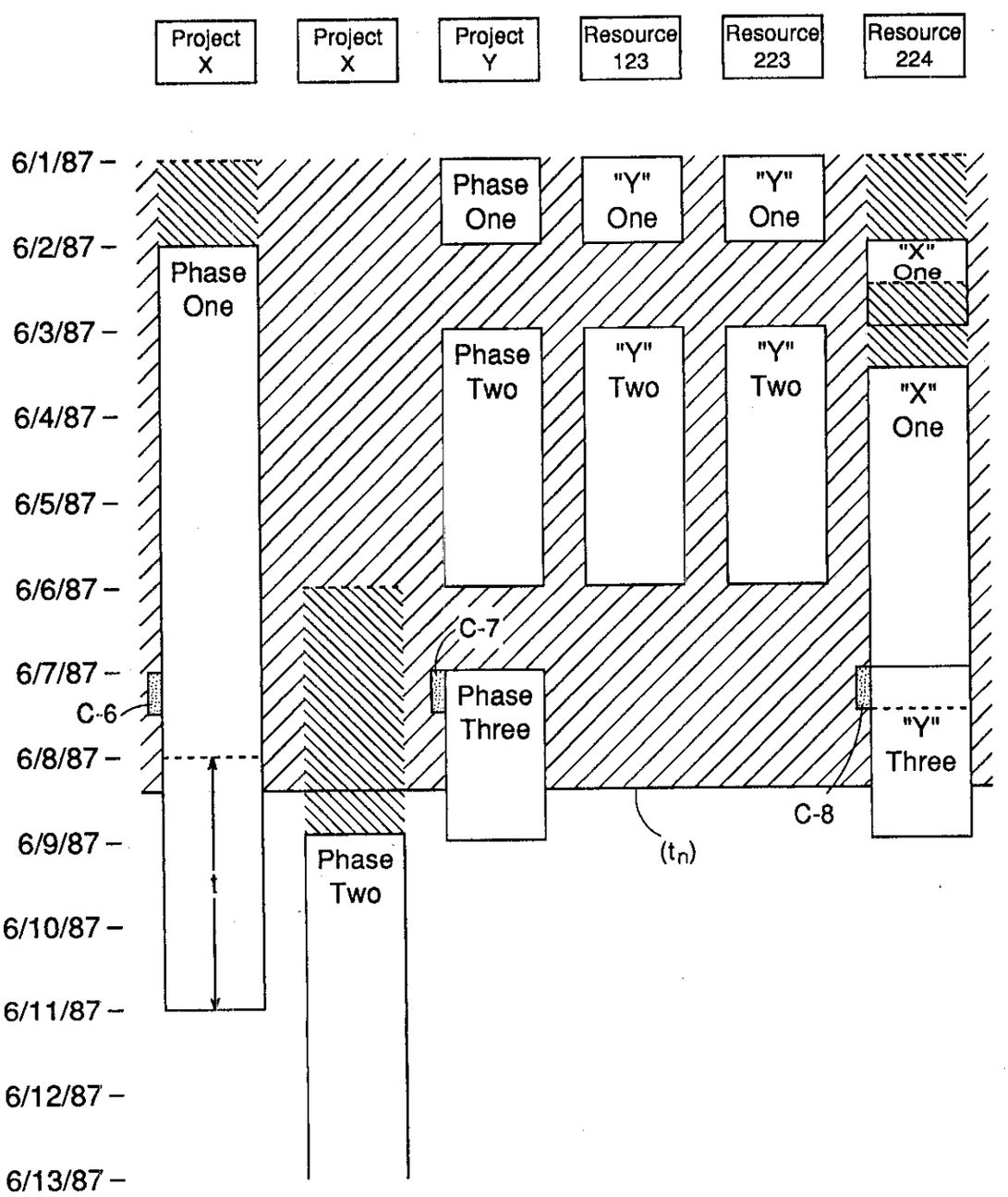

Project X
Project X
Project Y
Resource 123
Resource 223
Resource 224
6/1/87 –
6/2/87 –
6/3/87 –
6/4/87 –
6/5/87 –
6/6/87 –
6/7/87 –
6/8/87 –
6/9/87 –
6/10/87 –
6/11/87 –
Phase One
Phase Two
Phase One
Phase Two
Phase Three
"Y" One
"Y" Two
"Y" One
"Y" Two
"X" One
"X" One
"Y" Three

FIG. 7.


Project X
Project X
Project Y
Resource 123
Resource 223
Resource 224
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6/3/87 –
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6/6/87 –
6/7/87 –
6/8/87 –
6/9/87 –
6/10/87 –
6/11/87 –
6/12/87 –
6/13/87 –
Phase One
Phase Two
Phase Three
"Y" One
"Y" Two
"Y" Three
"X" One
"Y" One
"Y" Two
"X" One
C-6
C-7
C-8
t
(t_n)

FIG. 8.

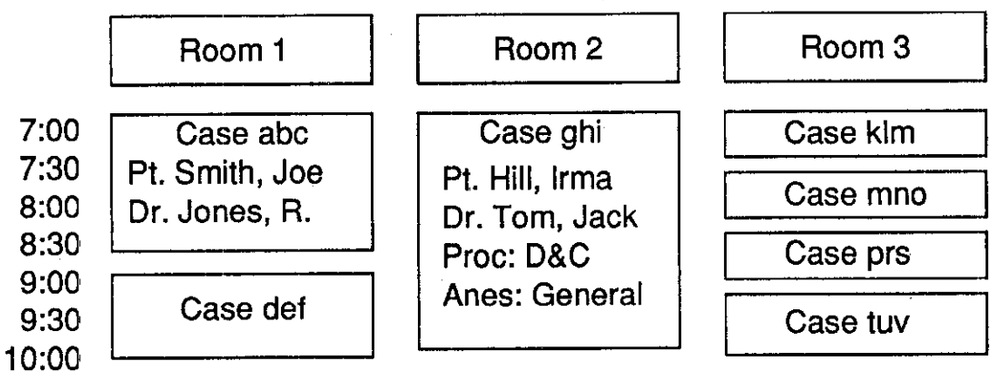
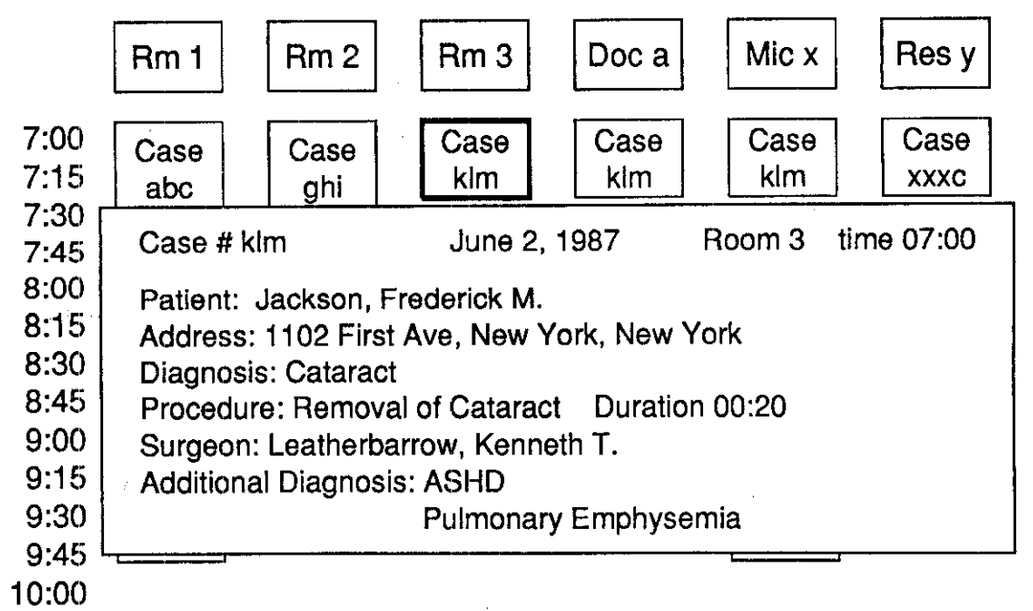
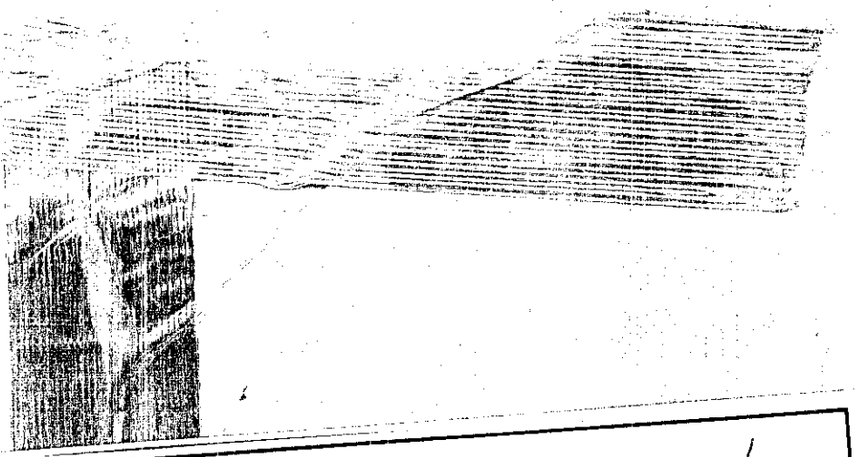

Room 1
Room 2
Room 3
7:00
7:30
8:00
8:30
9:00
9:30
10:00
Case abc
Pt. Smith, Joe
Dr. Jones, R.
Case def
Case ghi
Pt. Hill, Irma
Dr. Tom, Jack
Proc: D&C
Anes: General
Case klm
Case mno
Case prs
Case tuv

FIG. 9.


Rm 1
Rm 2
Rm 3
Doc a
Mic x
Res y
7:00
7:15
7:30
7:45
8:00
8:15
8:30
8:45
9:00
9:15
9:30
9:45
10:00
Case abc
Case ghi
Case klm
Case klm
Case klm
Case xxxc
Case # klm June 2, 1987 Room 3 time 07:00
Patient: Jackson, Frederick M.
Address: 1102 First Ave, New York, New York
Diagnosis: Cataract
Procedure: Removal of Cataract Duration 00:20
Surgeon: Leatherbarrow, Kenneth T.
Additional Diagnosis: ASHD
Pulmonary Emphysemia



PTO UTILITY GRANT

Paper Number 4

The United States of America

The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person or persons having title to this patent the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.

Harry F. Manbeck, Jr

Commissioner of Patents and Trademarks

Marcia L. Campbell

Attest

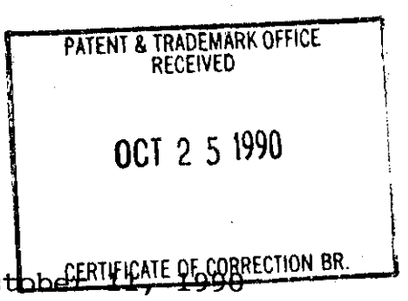
6000 145
C of C

924.1

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: G. Hayes
WILLIAM R. RASSMAN ET AL.	)	
	:	Group Art Unit: 236
Serial No.: 096,027	)	
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	)	
	:	
	)	
U.S. Patent No.: 4,937,743	:	
	)	
Issued: June 26, 1990	:	October 11, 1990



The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

CERTIFICATE OF CORRECTION
UNDER RULES 322 AND 323

Sir:

It is respectfully requested that a Certificate of Correction be issued by the Patent and Trademark Office due to errors which appear in the printed patent as a result of Patent and Trademark Office mistakes, and mistakes of a clerical, typographical, or minor character, which were not the fault of the Patent and Trademark Office. A Certificate of Correction form, in duplicate, is enclosed.

Accompanying this letter is a check for $60.00 to cover the statutory fee for such Certificate of Correction.

070 GS 10/22/90 096027 1 145 60.00 CK

Patentees' undersigned attorney may be reached by telephone in our New York office at

(212) 758-2400.

All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

Allan W. Fiedler

Attorney for Patentees

Registration No. 33,690

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
(212) 758-2400

Re: Request for certificate of Correction

Consideration has been given your request for the issuance of a certificate of correction in the above-identified patent.

Your request in column 17 line 52 and column 19 lines 6 & 12 was referred to the Group Director who reports as follows:

"Corrections requested in column 17 line 52, column 19 lines 6 & 12 would broaden the scope of claims affected."

In view of the foregoing, your request in these matters are hereby denied.

A certificate of correction will be issued to correct the remaining errors noted in your request.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

SHEET 9 OF 9

Figure 9, "Pulmonary Emphysemia" should read --Pulmonary Emphysema--.

COLUMN 2

Line 31, "such." should read --such--.

COLUMN 4

Line 7, "an" should read --a--.
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COLUMN 5

Line 12, "on audible" should read --an audible--.
Line 13, "schedule" should read --scheduled--.

COLUMN 6

Line 9, ""Status indicia."" should read --"status indicia."--.
Line 45, "anaesthesiologist's." should read --anaesthesiologists.--.

COLUMN 7

Line 41, ""construction" "sabatical"" should read --"construction", "sabbatical"--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

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Line 68, "the the" should read --the--.

COLUMN 9

Line 7, "9:00" should read --09:00--.
Line 8, "09:,30." should read --09:30.--.
Line 64, "two dimensional" should read --two-dimensional--.

COLUMN 11

Line 36, "contemporoue-" should read --contemporane---.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

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DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

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Line 48, "involved to" should read --involved.

The system can also be made to take certain actions automatically. For example, if a piece of equipment must be warmed up for a predetermined period of time before use, the method of the instant invention would encompass having the system energize that piece of equipment when a particular milestone in the procedure has been completed. Similarly, in an industrial setting, the system could automatically cut purchase orders or open molds when certain predetermined milestones are reached.

The method of this invention also contemplates a rule based system wherein the detection of certain conflict indicia would cause automatic rescheduling of some resources. To illustrate, assume that in FIG. 1, there must be 15 minutes between completing Case abc and beginning Case def. If a signal has not been sent by 8:50 that Case abc is over, a rule could be established that would automatically reschedule Case def to begin at 9:15. The rule could also require checking the schedules of all the resources involved in Case def before rescheduling.

If, upon checking those Case def-related schedules no new conflicts are detected, the rescheduling would be done and notice of the change communicated automatically to the people affected. This could be done, for example, by having the system call the office of the surgeon scheduled to do Case def and, by use of a voice synthesizer, report the new schedule.

If the rescheduling of Case def is found to provoke other conflicts, the system could be designed so as not to do the rescheduling, but instead merely to give notice of the first conflict. That notice could be by means of a visual display, by the sounding of a distinctive note or the like. Another possibility would be to have the system try to--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

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Lines 14-48, lines 14 to 48 should be deleted.

COLUMN 14

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Line 52, "pop up" should read --pop-up--.
Line 55, "pop up" should read --pop-up--.

COLUMN 15

Line 26, "I claim:" should read --We claim:--.

COLUMN 17

Line 2, "resource;" should read --resource; and--.
Line 10, "resource;" should read --resource; and--.
Line 52, "claim 27" should read --claim 26--.

Signed and Sealed this

Thirty-first Day of March, 1992

Attest:

Attesting Officer

HARRY F. MANBECK, JR.

Commissioner of Patents and Trademarks

2301
4-21-91
115

924.1

PATENT APPLICATION
4,937,743

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	:	Examiner: G. Hayes
WILLIAM R. RASSMAN ET AL.	)	
	:	Group Art Unit: ~~236~~ 231-B
Serial No.: 096,027	)	
	:	
Filed: September 10, 1987	)	
	:	
For: METHOD AND SYSTEM FOR SCHEDULING, MONITORING AND DYNAMICALLY MANAGING RESOURCES	)	
	:	October 25, 1991

U.S. Patent No. 4,937,743

Issued: June 26, 1990

PATENT & TRADEMARK OFFICE
RECEIVED
NOV 1 1991
CERTIFICATE OF CORRECTION BR.

The Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

STATUS REQUEST

Sir:

A Certificate Of Correction Under Rules 322 And 323 dated October 11, 1990 was filed in connection with the above-identified case.

To date, the undersigned has yet to receive the Official Certificate of Correction or any other paper acknowledging status. Accordingly, it is requested that such certificate or other indication of status be mailed in due course.

Called 11/5/91 EL

Applicants' undersigned attorney may be reached by telephone in our New York Office at

(212) 758-2400.

All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

Alan W Fialla

Attorney for Applicants

Registration No. 33,690

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172

F502\A65228\bks

NOTICE RE: CERTIFICATES OF CORRECTION

Paper No. _____

DATE : 1/16/92

TO : Supervisor, Art Unit 236

SUBJECT : Certificate of Correction Request in Patent No. 4,931,743

A response to the following question(s) is requested with respect to the accompanying request for a certificate of correction.

☒ 1. Would the change(s) requested under 37 CFR 1.323 constitute new matter or require reexamination of the application?

☒ 2. Would the change(s) requested under 37 CFR 1.323 materially affect the scope or meaning of the claims allowed by the examiner in the patent?

☐ 3. Applicant disagrees with change(s) initialed and dated by Examiner in lieu of an Examiner's Amendment. Should the change request be granted?

☒ 4. With respect to the change(s) requested, ~~correcting Office errors~~, should the patent read as shown in the certificate of correction?

☐ 5. If the amendment filed _____ had been considered by the Examiner, would the amendment have been entered?

PLEASE RESPOND WITHIN 7 DAYS AND RETURN THE FILE TO ROOM 809, PKI

H. Arrington
Patent Assistant

TO: CERTIFICATES OF CORRECTION BRANCH | **DATE:** 1-22-92

The decision regarding the change(s) requested in the certificate of correction is shown below.

1.	☑ YES	☐ NO	☐ Comments below
2.	☑ YES	☐ NO	☑ Comments below
3.	☐ YES	☐ NO	☐ Comments below
4.	☐ YES	☑ NO	☐ Comments below
5.	☐ YES	☐ NO	☐ Comments below

☑ Comments Amendments presented for ~~[illegible]~~, column 17 line 52, column 19 lines 6+12, would broaden the scope of claims affected.

Supervisor

2311
Art Unit

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

11 FEB 1992

Patent No: 4,937,743
William R. Rassman, et al
Issued: June 26, 1990
Method And System For
Scheduling, Monitoring And
Dynamically Managing Resources

Re: Request for Certificate of Correction

Consideration has been given your request for the issuance of a certificate of correction in the above-identified patent.

Your request in column 17 line 52 and column 19 lines 6 & 12 was referred to the Group Director who reports as follows:

> "Corrections requested in column 17 line 52, column 19 lines 6 & 12 would broaden the scope of claims affected."

In view of the foregoing, your request in these matters are hereby denied.

A certificate of correction will be issued to correct the remaining errors noted in your request.

Mary H. Allen, Supervisor
Decisions & Certificates
of Correction Branch

Fitzpatrick, Cella, HArper & Scinto
277 Park Avenue
New York, New York 10172

Staple Here Only !

PRINTER'S TRIM LINE

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL. Page 1 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

SHEET 9 OF 9

Figure 9, "Pulmonary Emphysemia" should read --Pulmonary Emphysema--.

COLUMN 2

Line 31, "such." should read --such--.

COLUMN 4

Line 7, "an" should read --a--.
Line 57, "semi permanent" should read --semi-permanent--.

COLUMN 5

Line 12, "on audible" should read --an audible--.
Line 13, "schedule" should read --scheduled--.

COLUMN 6

Line 9, ""Status indicia."" should read --"status indicia."--.
Line 45, "anaesthesiologist's." should read --anaesthesiologists.--.

COLUMN 7

Line 41, ""construction" "sabatical"" should read --"construction", "sabbatical"--.

MAILING ADDRESS OF SENDER:

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
(212) 758-2400

PATENT NO. 4,937,743

No. of add'l. copies @ 30¢ per page

FORM PTO-1050 (REV. 2-80)

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PRINTER'S TRIM LINE

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

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Line 37, "menu driven." should read --menu-driven.--.
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Line 7, "9:00" should read --09:00--.
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Line 64, "two dimensional" should read --two-dimensional--.

COLUMN 11

Line 36, "contemporoue-" should read --contemporane---.

MAILING ADDRESS OF SENDER:

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277 Park Avenue
New York, New York 10172
(212) 758-2400

FORM PTO 1050 (REV. 3-82)

PATENT NO. 4,937,743

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL.

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Line 48, "involved to" should read

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MAILING ADDRESS OF SENDER:

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
(212) 758-2400

FORM PTO 1050 (REV. 3-82)

PATENT NO. 4,937,743

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⇨ _____

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL. Page 4 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN 12

Lines 14-48, lines 14 to 48 should be deleted.

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Line 2, "resource;" should read --resource; and--.
Line 10, "resource;" should read --resource; and--.
Line 52, "claim 27" should read --claim 26--.

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FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
(212) 758-2400

PATENT NO. 4,937,743

No. of add'l. copies @ 30¢ per page

FORM PTO 1050 (REV. 3-82)

PRINTER'S TRIM LINE

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 4,937,743

DATED : June 26, 1990

INVENTOR(S) : WILLIAM R. RASSMAN ET AL. Page 5 of 5

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

COLUMN 19

Line 6, "claim 25 or claim 35" should read --claim 25 or 35--.

Line 12, "claim 46, 41, or 39" should read --claim 46, 42, or 39--.

MAILING ADDRESS OF SENDER:

FITZPATRICK, CELLA, HARPER & SCINTO
277 Park Avenue
New York, New York 10172
(212) 758-2400

PATENT NO. 4,937,743

No. of add'l. copies @ 30¢ per page

FORM PTO 1050 (REV. 3-82)

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

CHANGE OF ADDRESS/POWER OF ATTORNEY

LOCATION 9200 SERIAL NUMBER 07096027 PATENT NUMBER 4937743

THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 5514

THE PRACTITIONERS OF RECORD HAVE BEEN CHANGED TO CUSTOMER # 5514

THE FEE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 5514

ON 06/18/98 THE ADDRESS OF RECORD FOR CUSTOMER NUMBER 5514 IS:

FITZPATRICK, CELLA, HARPER & SCINTO
277 PARK AVENUE
NEW YORK NY 10172

AND THE PRACTITIONERS OF RECORD FOR CUSTOMER NUMBER 5514 ARE:

PTO INSTRUCTIONS: PLEASE TAKE THE FOLLOWING ACTION WHEN THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER NUMBER: RECORD, ON THE NEXT AVAILABLE CONTENTS LINE OF THE FILE JACKET, 'ADDRESS CHANGE TO CUSTOMER NUMBER'. LINE THROUGH THE OLD ADDRESS ON THE FILE JACKET LABEL AND ENTER ONLY THE 'CUSTOMER NUMBER' AS THE NEW ADDRESS. FILE THIS LETTER IN THE FILE JACKET. WHEN ABOVE CHANGES ARE ONLY TO FEE ADDRESS AND/OR PRACTITIONERS OF RECORD, FILE LETTER IN THE FILE JACKET.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

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THE CORRESPONDENCE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 5514

THE PRACTITIONERS OF RECORD HAVE BEEN CHANGED TO CUSTOMER # 5514

THE FEE ADDRESS HAS BEEN CHANGED TO CUSTOMER # 5514

ON 08/03/99 THE ADDRESS OF RECORD FOR CUSTOMER NUMBER 5514 IS:

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK NY 10112

AND THE PRACTITIONERS OF RECORD FOR CUSTOMER NUMBER 5514 ARE:

17398	17739	18973	20452	20860	22291	23086	24135	24245	24367
24613	24947	25499	25512	25823	26702	26718	27276	27290	28373
28667	28861	29117	29292	29296	29767	30051	30110	30938	31530
31588	31865	32078	32433	32452	32533	32622	32716	32734	33202
33326	33628	33856	33972	34382	35161	35317	35345	35409	36171
36570	37292	37689	37838	38231	38544	38586	38894	39378	39683
39832	39853	40072	40980	41147	41339	42080	42476	42667	42669

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Telecommunications; General Business; Preventive Maintenance Scheduling; Commercial/Industrial
AB - Dynamic Details, Inc. sells Preventive Maintenance Scheduling, a telecommunications equipment maintenance scheduling program for the Burroughs B25 and Burroughs XE series of microcomputers. It tracks weekly PM and special request work, and can generate yearly PM schedules based on user-defined intervals. It can balance workloads automatically, and can do time reporting and productivity summaries. It also can handle task rescheduling. Price as of 3/87 is $50,000.

-6-
AN - 86-03[illegible]
TI - Time Line
AU - Jackson, Gary
MC - Breakthrough Software Corp.; 10813
SO - PC World; Vol. 4, No. 4, P. 166/43, 04/86
SP - IBM PC; IBM PC XT; IBM PC AT; MS-DOS
DT - Software Review
IT - Project Management; PERT; Critical Path Analysis; Schedules
AB - Time Line, from Breakthrough Software Corp., is a project management program that will run on the IBM PC, PC XT, and PC AT. The reviewer had high praise for this program, lauding its smooth command structure, pleasing screen graphics, and clear organization. Its only deficiency, he said, was lack of support for plotters. Time Line is menu driven, but uses a Gantt chart rather than a traditional menu. It uses predesigned forms for gathering information about a project and can display the project as a Performance Evaluation and Review Technique (PERT) chart at any time. The reviewer said PERT charts were very useful for examining interdependencies of tasks to one another. The reviewer liked the calendar, which can run the course of 35 years and automatically includes all standard holidays. The program also features a sophisticated method of allocating resources, which include time, man-hours, equipment, and materials. Time Line data can be transferred to a Lotus 1-2-3 template or to Symphony, dBase III or III, MultiPlan, or SuperCalc. The reviewer said Time Line was a top-quality product that would be useful both to beginners and to veteran project managers.

-7-
AN - 86-07[illegible]
TI - The EA Grant Writer
MC - Educational Activities, Inc.; 11532
SO - 01/86
SP - Apple II; Apple II Plus; Apple IIc; Apple IIe
DT - Product Literature, Software
IT - School Administration
AB - The EA Grant Writer is a computer program that assists novice or professional writers in writing grant proposals. Michael Silverman wrote this program, which is sold by Educational Activities, Inc. for use on any Apple II series computer. The author can rely on this program to start from the beginning, if needed, or to just organize the basics, so that he can add other important material. The EA Grant Writer provides assistance in the preparation of grant applications, narratives, and project budgets in four separate areas: Reading, Writing, Mathematics and School Library Resources, and Equipment. The program can create proposals in any other subject, as well. This grant writing system is available on separate diskettes for: Reading Proposal

Writer, Mathematics Proposal Writer, Writing Proposal Writer, School Library Resources and Equipment Proposal Writer, and General Purpose Proposal Writer. Each subject area contains two diskettes (one operating disk and one topic disk), two back-ups, management, and documentation for $98. The complete series of six diskettes (one operating disk and five topic disks), six back-ups, management and documentation and is available for $249 (prices as of 1/86).

-8-

AN - 85-[illegible]
TI - Project Planning Solves Three Problems
AU - Adams, Russ
MC - Applitech Software, Inc.; 14494
SO - Business Software, (Vol. 3, No. 3, P. 26/3), 03/85
SP - Apple IIe; Apple IIc; ProDOS
DT - Software Review
IT - Applications, Business; Project Management; Planning; Schedules
AB - The article includes the comments of three professionals on the project management software package Project Planner. The first person uses the software primarily to close sales in the medical equipment business. According to this person, the software generates easy-to-understand printouts. The second person uses the software to prepare manufacturing time schedules and to generate schedule charts in a company that produces circuits. This person says that charts can be prepared in 30 minutes with the program instead of three hours by hand. The third person uses the program for construction planning. The users say that the program has good error handling abilities, excellent documentation, and is easy to learn and use. The version used by the professionals is for the Apple IIe and IIc and the program is from Applitech Software, Inc.

-9-

AN - 84-[illegible]
TI - Priority One: The Personal Productivity Planner
MC - Personal Touch Software; 13893
SO - 05/[illegible]
SP - IBM PC; IBM PC XT; PC-DOS
DT - Product Literature, Software
IT - Project Management; Calendars; Productivity
AB - Priority One: The Personal Productivity Planner, from Personal Touch Software, is a time management program designed for individuals, supervisors, and managers who need to manage their own activities, plus the work schedules of others. The program helps organize complex work schedules so that the results of changes in work hours, days off, vacations, and so forth, can be seen. Up to 100 projects can be handled in each file, and there is no limit to the number of files that can be created. Two types of work schedules can be generated: one on a weekly calendar basis and the other on a project start/stop basis. Both schedules can be printed out in report form. Data on projects is maintained in a priority ranking from 1 to 199. The resulting schedules allow the user to produce work plans, set work objectives, and anticipate when work will be started and stopped. Required equipment includes: an IBM PC, XT, or compatible; one disk drive (single sided or double sided); 64 KB RAM (DOS 1.1), or 96 KB RAM (DOS 2.0/ 2.1), or PC-DOS (1.1 or 2.0/2.1); BASICA; and Monochrome display and interface card, or Color monitor and graphics.

3

-10-
AN - 34-C 7424
TI - Micro Management Project Control System
MC - S + T Associates; 12223
SN - 11/26/83
SP - IBM P.C. PC-DOS
DT - Product Literature, Software
IT - Project Management, Critical Path Analysis
AB - Micro Management Project Control System (MPCS), from S + T Assoc. Case, is a comprehensive microcomputer-based project control system for the IBM PC. Required equipment includes: 128K bytes of memory, a 10 megabyte Hard Disk, a heavy duty printer, one double sided/double density disk, and PC-DOS. MPCS is interactive and easily updated through menu prompts. Features include: Time Accounting and Cost Control, Individual Employee/Resource Control, Pre-defined Reports, Non-standard Reports created with the Generalized Report Writer, Bar Charts and Critical Time Reports, Summary Reports, Segregate and Control Multiple Projects for Multiple Users, and more. Price is $1,200 for a perpetual license. A demonstration copy and user's manual are available for $100. Prices are as of 11/26/83.

SS 7 /C?
USER>

PROG:

-100-
AN - 85-[illegible]
TI - Time Line: Tracking Projects Made Easier
AU - Rand, Mark E.
MC - BreakThrough Software Corp.; 10813
SO - InfoWorld, (Vol. 7, No. 3, P. 38/23), 01/21/85
SP - IBM PC; IBM PC XT; PC-DOS; MS-DOS
DT - Software Review
IT - Applications, Business; Office Productivity; Time Line; Planning; Project Management; Schedules; Applications, Professional; Charts
AB - Time Line, from BreakThrough Software Corp., is a program that aids a project manager in tracking a project. Some of its features include: context sensitive on-line helps; the production of basic Gantt and PERT planning charts; the use of either color or green monitors; storage of up to eight copies of a plan; and support of a hard disk. According to the reviewer, Time Line can designate up to 1000 tasks to a project; up to 16 resources per task or project; and can ascribe 9,999 cost categories to each task. The reviewer says that Time Line can be beneficial to project managers because it manages more complex projects than do other similar programs. However, it does not allow the user to compare an actual schedule to a planned schedule. The reviewer also criticizes the program for its limited number of resources per project and its inability to support sideways printing or plotters. The program is available for the IBM PC, PC XT, and compatibles with two disk drives. The reviewer recommends that shoppers determine before buying whether Time Line will handle the types of projects the user intends to manage.

-101-
AN - 85-[illegible]
TI - Time Line
MC - BreakThrough Software Corp.; 10813
SO - 11/84
SP - IBM PC; IBM PC XT; PC-DOS
DT - Product Literature, Software
IT - Project Management; Applications, Business; Critical Path Analysis
AB - Time Line offered by BreakThrough Software is an easy-to-learn powerful tool designed for small- or large-scale project management. It contains capabilities that enable the user to perform an unlimited number of tasks such as retrospective project planning from a known end date; planning and tracking multi-level projects over many years using Critical Path Method techniques; keeping track of personal appointments; prioritizing tasks to more efficiently schedule resources; tracking costs; producing a status report which reflects late tasks, those currently in-progress, and those to start within the week; and customizing reports. Time Line is an efficient program to use with clean and straightforward screen displays and provides fast recalculation of the schedule. It includes an on-line HELP facility. It operates on IBM PC and XT and requires 156K memory and PC-DOS 2.0 or 2.1. The price is $395.00 (as of 11/84).

-102-
AN - 84-01[illegible]
TI - PertMaster
MC - Westminster Software; 13542
SO - Business Software, (Vol. 2, No. 8, P. 70/1), 11/84
SP - MS-DOS, CP/M
DT - Software Review
IT - Applications, Business; Applications, Small Business; Project Management; PertMaster
AB - PertMaster is a project management program for managing large projects with microcomputers. It follows the project evaluation review technique (PERT). It is from Westminster Software and runs under PC-DOS or CP/M. The program includes simple editing commands and a set of reporting and display options. The user can purchase either a 1500 activity version or a 3500 activity version. Both versions handle scheduling; allow the user to establish a set of abbreviations; and monitor resources according to the abbreviation set. The reviewer emphasized that the program is for large projects.

-103-
AN - 84-01[illegible]
TI - Task [illegible]. Primavera Project Planner
AU - Daugherty, Bill; Darnell, Leonard
MC - Primavera Systems, Inc.; 10570
SO - PC World, (Vol. 2, No. 10, P. 135/140), 09/84
SP - IBM PC; PC-DOS
DT - Software Review
IT - Primavera Project Planner; Project Management; CP/M; Applications, Business; Applications, Small Business
AB - Primavera Project Planner from Primavera Systems offers planning, monitoring and tracking for project management. It runs on the IBM PC with 512K RAM, a 10MB hard disk, and DOS version 2.00 or 2.10. The reviewers found it to be a very powerful and sophisticated program. It can handle complicated interrelationships, as well as provide detailed projections and data tracking of resources and costs. Primavera is a batch program, and dedicated to project data entry. The reviewers note that this can daunt the novice. The program can undertake 10,000 tasks. CP/M is used for project scheduling, and project calendars and report writing are offered. The reviewers found its greatest strength is project tracking and monitoring. The documentation includes a tutorial.

-104-
AN - 84-01[illegible]
TI - JobTrax
MC - Omicron Corporation; 13067
SO - 07/84
SP - IBM PC; PC-DOS
DT - Product Literature, Software
IT - Project Management; Engineering; Architecture; Construction; Critical Path Analysis
AB - JobTrax from Omicron is a project management program for engineering, architectural and construction projects. It features CPM (Critical Path Method) scheduling. It has a built-in screen editor. JobTrax plans manpower and resource requirements, and monitors project budget and schedule status with graphic reports and status information. The system operates on PC-DOS version 1.1 and [illegible] color display only, two disk drives, 128K

color graphics adapter, and BASIC. The price is $310.00 (as of 7/84).

-105-
AN - 84-0[illegible]
TI - Managing, Scheduling Software Compared
AU - Kallenbach, Rolf
MC - Scitor Corp.; 13182
SO - PC Week, (Vol. 1, No. 10, P. 19/1), 03/06/84
SP - IBM PC; PC-DOS; MS-DOS; Texas Instruments
DT - Comparative Software Review
IT - Project Scheduler; Harvard Project Manager; Harvard Software; TaskManager; Quala; Project Management; IBM PCjr; Data Interchange Format
AB - Three project-management software packages are reviewed and compared for their abilities to meet some general criteria established by the reviewer to judge any task/job scheduling software. Of the three, Harvard Project Manager (Harvard Software) is the most expensive and offers the most features, most notably virtual screens, windowing capability, and editing features. It can handle up to 200 tasks per project and output its reports to DIF files. Of the three, TaskManager (Quala) handles the most jobs per project--up to 999 jobs. TaskManager is strong in report definition and sorting functions, claims the reviewer, but it cannot transfer reports to a file or project totals to a DIF file. Project Scheduler (Scitor Corp.) is the least expensive of the three and can handle up to 210 jobs per project. It can also track the costs of 24 labor resources per project. It can produce a variety of reports but only two project totals can be transferred to a DIF file. All of the programs are available for the IBM PC with a minimum of 128K RAM. TaskManager is available for the IBM PCjr.

-106-
AN - 84-0[illegible]
TI - Business Management Software
AU - Hazel, Mike
MC - Datamension Corporation; 11344
SO - Microcomputing, (Vol. 8, No. 5, P. 140/3), 05/84
SP - IBM PC; MS-DOS
DT - Software Review
IT - Business Management Software; Task Manager; Records Manager; Project Manager; Time Management; Applications, Business; Integrated Software; Spreadsheets
AB - Business Management Software, from Datamension Corp., offers three "sophisticated" programs to help the business person manage time, people, and resources. Although the programs can be used separately, their real utility lies in their ability to share information, notes the reviewer. The first program, Task Manager, is a schedule and priority planner. It generates a "to do" list and can keep track of expenses for hours worked, etc. The second program, Records Manager, maintains data on clients and employees and can generate reports with selected fields of data, such as name, address, and phone number. The third program, Project Manager, allows for creating Pert, Gantt (in bar form), and resource charts useful in project planning. The reviewer claims the programs are not easy to learn initially, but once mastered can be very useful tools. Some design improvements are suggested by the reviewer. The three programs are available for the IBM PC or MS-DOS systems and require 128K RAM, two 320K disk drives, or

floppy and hard disk. A fourth program not reviewed (a spreadsheet) can also share the same data.

-107-
AN - 84-[illegible]
TI - Smoothing the Critical Path
AU - Reifman, Kearney
MC - Apple Computer, Inc.; 10309
SO - Macworld, {Vol. 1, No. 3, P. 52/12}, 07/84
SP - Apple Macintosh
DT - Software Review
IT - MacProject; Applications, Business; Project Management
AB - MacProject is project management software for the Apple Macintosh computer. It offers "what-if" financial analyses, and six different methods in which to monitor a project including schedule, cash flow, resource, resource cost, task, and project table analyses. Each perspective has its own type of corresponding chart. The review includes several illustrations of the charts and their applications. The program is a computerized method of creating flow charts. MacProject is available from Apple Computer.

-108-
AN - 84-[illegible]
TI - Project Scheduler
MC - Scitor Corp.; 13182
SO - 07/84
SP - IBM PC, PC-DOS
DT - Product Literature, Software
IT - Applications, Business; Project Management; VisiCalc; SuperCalc
AB - Project Scheduler from Scitor Corporation is a highly interactive Project Management Program. The system has a sophisticated "what if" analysis and the menu prompts enable the user to effectively manage a project. Project monitoring can be done through its black and white or color displays. It has the capability of producing sets of reports, VisiCalc and SuperCalc-compatible cost or resource data. The package operates on PC-DOS versions 1.1 and 2.0. It requires one disk drive or a hard disk, 92K minimum memory and color or monochrome, 80-column display. It is priced at [illegible] (as of 7/84).

-109-
AN - 84-[illegible]
TI - Business Management Software
AU - Hardy, Mike
MC - Datamension Corporation; 11344
SO - Microcomputing, {Vol. 8, No. 5, P. 140/3}, 05/84
SP - IBM PC; MS-DOS
DT - Software Review
IT - Business Management; Applications, Business; Management; Scheduler; Time Management; Database Management; Critical Path Analysis; Project Management
AB - Three programs comprise Business Management from Datamension. These include Task Manager, Records Manager, and Project Manager. All these can share files and use the same commands. The package requires an IBM PC computer or MS-DOS-based system with at least 1[illegible] [illegible], and two disk drives or one floppy and one hard disk. Task Manager organizes and schedules time, Records Manager serves as a database for employee and client data, and Project Manager provides critical path and resource scheduling. The reviewer

form that the programs succeed in increasing business productivity, after time is spent learning them.

-110-
AN - 84-[illegible]
TI - Microsoft's Project-Management Program to Carry $250 Price Tag
AU - Carroll, Denise
MC - Microsoft Corp.; 11941
SO - InfoWorld, (Vol. 6, No. 17, P. 42/1), 04/23/84
SP - IBM PC
DT - Software Review
IT - Project; Project Management; Graphics; Report Generation; dBASE II; Lotus 1-2-3
AB - Microsoft's Project is a project management program for the IBM PC that has a lower price-tag than existing project managers. The program, which can generate simple graphical schedules, uses Gantt chart display and spreadsheetlike screen style. A unique feature is that it can handle an unlimited number of scheduling activities. It features the built-in ability to generate and print various types of "canned" reports. The user interfaces are the same as Microsoft's Chart, Multiplan, and Word. User has the option of the Microsoft mouse. The program can be used with such other software as dBASE II, 1-2-3, and most word processors, so that data can be transferred between these programs without being reentered. Other features include display color options, on/off switch for recalculation, Help screens, and layering. Its multifunction capabilities include in-depth resource calculation for creating schedules with varying amounts of detail.

-111-
AN - 84-[illegible]
TI - Software Decisions: VisiSchedule
MC - VisiCorp.; 2516
SO - Business Software, (Vol. 2, No. 7, P. 42/7), 05/84
SP - IBM PC
DT - Software Review
IT - VisiSchedule; Critical Path Analysis; Project Management
AB - VisiSchedule, from Visicorp, is a menu-driven program that uses critical path analyses to assist the project manager in setting up project schedules, tracking progress and setbacks, and assisting in distributing available resources. The program is compatible with the IBM PC. Once the project data has been input, a variety of reports can be generated such as, status reports, project description reports, job description reports, and job reports. The article includes two quotes from other sources evaluating VisiSchedule. InfoWorld rated the program as "good" in performance to and ease of use while The Book of IBM Software 1984 gave it an overall rating of "A-."

-112-
AN - 84-[illegible]
TI - Priority One: The Personal Productivity Planner
MC - Personal Touch Software; 13893
SO - 05/84
SP - IBM PC, IBM PC XT; PC-DOS
DT - Product Literature, Software
IT - Project Management; Calendars; Productivity
AB - Priority One: The Personal Productivity Planner, from Personal Touch Software, is a time management program designed for individuals, supervisors, and managers who need to manage their

own activities, plus the work schedules of others. The program helps organize complex work schedules so that the results of analysis in work hours, days off, vacations, and so forth, can be seen by all. Up to 100 projects can be handled in each file, and there is no limit to the number of files that can be created. Two types of work schedules can be generated: one on a weekly calendar basis and the other on a project start/stop basis. Both schedules can be printed out in report form. Data on projects is maintained in a priority ranking from 1 to 199. The resulting schedules allow the user to produce work plans, set work objectives, and anticipate when work will be started and stopped. Required equipment includes: an IBM PC, XT, or compatible; one disk drive (single sided or double sided); 64 KB RAM (DOS 1.1), or 96 KB RAM (DOS 2.0/2.1), or PC-DOS (1.1 or 2.0/2.1); BASICA; and Monochrome display and interface card, or Color monitor and graphics.

-113-
AN - 84-0 [illegible]
TI - CONTRACTOR MANAGEMENT PROGRAM
MC - DYNACOMP, Inc.; 11505
SO - O1/84
SP - TRS-80 Model I; TRS-80 Model III; TRS-80 Model IV
DT - Product Literature, Software
IT - General Contracting; Applications, Business; Project Management
AB - CONTRACTOR MANAGEMENT PROGRAM (CMP), from DYNACOMP, Inc., was designed to assist general contractors and similar businesses in planning, estimating, scheduling, and controlling aspects of the contracting business. The program maintains four data files: on equipment, personnel, materials, and contracted services. Features include: an evaluation command for evaluating costs, a bracket; command for generating specialized data output by any category, and full editing capabilities. CMP is menu-driven and prompts for each required input. Required equipment includes: 48K RAM, one disk drive, and a printer. Price on disk is $59.95 (as of 1/84).

-114-
AN - 84-0[illegible]
TI - JOBMASTER
MC - DYNACOMP, Inc.; 11505
SO - O1/84
SP - TRS-80 Model I; TRS-80 Model III; TRS-80 Model 4
DT - Product Literature, Software
IT - Project Management; Applications, Business
AB - JOBMASTER, from DYNACOMP, Inc., is designed for the professional responsible for managing small production and assembly programs. JOBMASTER is a versatile program that allows for rapid access to important data for scheduling, planning, and controlling production. Full editing and file maintenance are supported. File evaluations can be made in eight different data categories, such as, contract-by-contract basis, employee-by-employee basis, date-by-date basis, etc. Other features include: schedule preparation, sort and search capabilities, cash flow/man loading projections, and more. JOBMASTER operates with menu-driven commands and prompts for data input. Error trapping is included to prevent data loss. The program is available for the TRS-80 Models I, III, and IV. Required equipment includes a disk drive, 48K RAM, and a printer. Price is $69.95 (as of 1/84).

-115-
AN - 83-[illegible]
TI - PROJECT MANAGEMENT SYSTEM
MC - PEACHTREE SOFTWARE, INC.; 12068
SO - 07/83
SP - CP/M; [illegible]
DT - PROGRAM LITERATURE, SOFTWARE
IT - PROJECT MANAGEMENT SYSTEM; PROJECT MANAGEMENT; CRITICAL PATH ANALYSIS; PASCAL MT+
AB - PEACHTREE'S PROJECT MANAGEMENT SYSTEM ALLOWS THE MANAGER TO STRUCTURE MODEL PROJECTS. IT ASSIGNS RESOURCES TO VARIOUS TASKS AND PROVIDES INFORMATION ON SCHEDULING, WORKLOAD DISTRIBUTION, ACCOUNTING, AND OTHER ASPECTS OF PROJECT MANAGEMENT. AMONG FEATURES OF THE PROGRAM ARE MENU FORMAT; THE ABILITY TO BREAK A PROJECT DOWN INTO THREE INCREASINGLY DETAILED SETS OF TASKS; THE OPTION OF SCHEDULING EXPLICITLY WITH AN ELECTRONIC SPREADSHEET OR USING A GANTT CHART TO DO RESOURCE LOAD LEVELING; AND A CRITICAL PATH METHOD NETWORK, WHICH HELPS SPECIFY WHICH TASKS MUST BE COMPLETED BEFORE ANOTHER CAN BEGIN. THE PROGRAM ALSO ISSUES A VARIETY OF REPORTS, WITH THE USER SPECIFYING CONTENT. PROJECT MANAGEMENT SYSTEM IS WRITTEN IN PASCAL MT+. IT OPERATES UNDER EITHER PRO-DOS, VERSION 1.0 OR LATER WITH 128K RAM; OR CP/M, VERSION 2.0 OR LATER, WITH 50K RAM FREE OF CP/M.

-116-
AN - 84-[illegible]
TI - ManageMint
MC - Institute for Scientific Analysis; 12865
SO - 04/84
SP - IBM PC XT; TRS-80 Model II; TRS-80 Model III; TRS-80 Model 4
DT - Program; Literature, Software
IT - Project Management; PERT
AB - ManageMint from the Institute for Scientific Analysis is a PERT project management package that operates on the IBM PC XT, the TRS-80 Models II, III, 4, 12, and 16, and all CP/M based machines with 64K RAM. This menu-driven package can handle up to 999 tasks, 50 holidays, and 1200 working days in its 8-bit version. The 16-bit version has a larger capacity. A budget can be entered along with 26 different resources. Each task can be assigned up to four resources and a budget. ManageMint is composed of modules. The main system contains file maintenance and calculation modules. The scheduling module converts time units into calendar days and produces Gantt charts. The resource management module generates graphs plotting budget and resource utilization against time. Price of the main system is $395, the scheduling option is $150, and the resource management module is $150 (as of 4/84).

-117-
AN - 83-[illegible]
TI - PROJECT MANAGER
MC - TANDY CORP.; 12414
SO - (TRS-80; 16/IP.), 1982
SP - TRS-80 MODEL III
DT - PROGRAM LITERATURE, SOFTWARE
IT - MANAGEMENT; TRS-80 MODEL I; RADIO SHACK; PROJECT MANAGER; MANAGEMENT
AB - PROJECT MANAGER CREATES GRAPHIC DISPLAYS AND PLANNING OUTLOOKS FOR USE IN THE MANAGEMENT OF ANY PROJECT. IT IS CAPABLE OF GRAPHIC DISPLAYS OF TIME, SEQUENCE PERSONNEL, MATERIALS, OR

RESOURCES DEPENDING UPON PROJECT GOALS; AND CAN SHOW TASK EFFECT ON [illegible] SCHEDULE. TIME, TASK, PERT, AND GANT CHARTS CAN BE PROGRAMMED AS WELL AS AN OVER-ALL MANAGER'S CALENDAR. THE SYSTEM REQUIRES A TRS-80 MODEL I OR MODEL III WITH 48K AND TWO DISK DRIVES AND CAN INTERACT WITH ANY PROGRAM OF THE TRS-80 MANAGER SERIES. THE PROGRAM SELLS FOR $99.95 (AS OF 12/82).

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SS 9 /C?
USER:
his


PROG:
SS 1:  PROJECT (S) MANAGEMENT  (530)
SS 2:  ALL RESOURCE#  (825)
SS 3:  ALL EQUIPMENT#  (1210)
SS 4:  1 AND 2  (196)
SS 5:  1 (F) 2  (159)
SS 6:  3 (F) 1  (10)
SS 7:  ALL SCHEDUL: (S) (  ALL RESOURCE# OR ALL EQUIPMENT#  )  (209)
SS 8:  1 AND 7  (117)

SS 9 /C?
USER:
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print [illegible]

PROG:

-1-
AN - 88-[illegible]
TI - [illegible] Office Desktop Organizer Includes E-Mail, Group Scheduling

-2-
AN - 88-[illegible]
TI - [illegible]

-3-
AN - 88-[illegible]
TI - [illegible] 2.2: Workgroup Productivity Boosters

-4-
AN - 87-[illegible]
TI - [illegible] Library

-5-
AN - 87-[illegible]
TI - [illegible] Avoiding Scheduling Conflicts

-6-
AN - 86-[illegible]
TI - [illegible]'s Project

-7-
AN - 86-[illegible]
TI - [illegible] Software Shelf: Legalex Calendar System

-8-
AN - 86-[illegible]
TI - The [illegible]ssifier

-9-
AN - 86-[illegible]
TI - [illegible] Scheduling

-10-
AN - 86-[illegible]
TI - IMS [illegible] Office Management System

-11-
AN - 86-[illegible]
TI - IMS [illegible] Office Management System

-12-
AN - 86-[illegible]
TI - IMS [illegible] Office Management System

-13-
AN - [illegible]
TI - The [illegible] Sellers: Scitor's Project Schedule Network

-14-

AN - [illegible]
TI - [illegible] Project

-15-
AN - [illegible]
TI - A Powerful, Easy Project Manager

-16-
AN - [illegible]
TI - [illegible] Busters: Spotlight

-17-
AN - [illegible]
TI - Shifting Personal Chaos: Higgins

-18-
AN - [illegible]
TI - PROMPTNER: A Microcomputer Software System for Project Planning and Scheduling

-19-
AN - [illegible]
TI - Educational Software Roundup: Zoo

-20-
AN - [illegible]
TI - LOOK BEFORE YOU KEEP: FIVE TIME MANAGEMENT PROGRAMS TO AVOID

-21-
AN - [illegible]
TI - BEFRIEND 25TH HOUR, 25:01 - TIME SCHEDULER/ORGANIZER

SS 5 /CP
USER:
prt full 1, 5, 9, 113, 15, 16, 18, 21

PROG:
ILLEGAL [illegible] OF RANGING PARAMETERS. PRINT COMMAND IGNORED.

SS 5 /CP
USER:
prt full 1, 5, 9, 13, 15, 16, 18, 21

PROG:
ILLEGAL [illegible] OF RANGING PARAMETERS. PRINT COMMAND IGNORED.

SS 5 /CP
USER:
prt full 5, 9, 9

PROG:

P - MS-DOS; PC-DOS; IBM PC; IBM PC AT
T - Product Literature, Software
T - Project Management; General Business; Graphics Utilities; CAD; Symbols; Parts/Equipment; Cost Estimating; Bill of Materials Builder XL; Graphics
R - Bill of Materials Builder XL (BOMB), from ADEPT Software Corp., is a menu-driven program that automatically takes symbol and linear quantities from AutoCAD drawings to make the user's estimates precise according to what is in the drawing. Designed for real-life costing situations, BOMB XL runs on the IBM PC and PC AT with MS- or PC-DOS and a hard disk (as well as any other personal computer that supports AutoCAD). Its price list tracks four kinds of costs (factory, labor, accessories, and subcontract). Each element in the AutoCAD drawing is exploded into the necessary number of component parts and pieces. The user can create a full Bill of Materials for each linear unit or block that is used in the drawing. All database management tasks are handled by this program's graphic format. It uses a visual interface so the user can always determine where he is in the program at any one time. This program includes a user's guide, and the manufacturer offers in-person training if desired. BOMB (Symbols Take-Off only) costs $495. The BOMB XL program (Symbols plus Linear Take-Off) costs $595 as of 8/87.

1

-4-
- 87-[illegible]236
- Finest Hour
- Primavera Systems, Inc.; 10570
- 04/87
- IBM PC; IBM PC AT; IBM PC XT; MS-DOS
- Product Literature, Software
- Project Management; Schedules; Calendars; Finest Hour; General Business
AB - Finest Hour, from Primavera Systems, Inc., is project management program for the IBM PC, PC AT, and PC XT. It offers on-screen updating, review, and analysis of project details complete with graphics. This lets the user control such short-duration, high-intensity jobs as plant shut-downs, turn-arounds, and outages. The multiple calendar and hourly scheduling capability helps overcome resource constraints and equipment bottlenecking without damaging the budget or schedule. Fifteen individual workday calendars can have activities assigned to them. The user can plan activities, schedules, and resources in hourly increments if desired. An advanced data entry mode is available for faster input. Other features include loop detection and identification, the ability to merge multiple projects, 10,000 activities, a 432-character activity log, 20 activity code fields, and 96 resources per project. Data can be exported into 1-2-3, dBase III, and ASCII files. Batch mode data import is supported. Project data is accepted from Microsoft Project version 3.0. Finest Hour costs $75 as of 4/87.

-5-
AN - 87-[illegible]
TI - Preventive Maintenance Scheduling
MC - Dynamic Results, Inc.; 16617
SO - [illegible]
SP - Burroughs B25; MS-DOS
DT - Product Literature, Software
IT - Project Management; Schedules; Maintenance; Parts/Equipment;

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

(FOR USE WITH FORM PTO-875)

SERIAL NO. 096,427 | FILING DATE 9-10-87

APPLICANT(S) Kassman, et al

CLAIMS

	AS FILED		AFTER 1st AMENDMENT		AFTER 2nd AMENDMENT	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
1	1					
2	1					
3		2				
4		2				
5		1				
6		1				
7		1				
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36		1				
37		1				
38		1				
39		1				
40		1				
41		1				
42		1				
43		1				
44		1				
45		1				
46		1				
47		1				
48		1				
49		2				
50		1				
TOTAL IND.	4					
TOTAL DEP.	36					
TOTAL CLAIMS	40					

36
3
39

	*		*		*	
	IND.	DEP.	IND.	DEP.	IND.	DEP.
51		1				
52		1				
53		1				
54		3				
55		2				
56		2				
57		2				
58		2				
59		2				
60		1				
61			3			
62						
63						
64						
65						
66						
67						
68						
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91						
92						
93						
94						
95						
96						
97						
98						
99						
100						
TOTAL IND.	4					
TOTAL DEP.	39					
TOTAL CLAIMS	43					

FORM PTO-875
(REV. 1-86)

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

PATENT APPLICATION FEE DETERMINATION RECORD

SERIAL NO	FILING DATE
096,027	9-10-87
APPLICANT (FIRST NAMED)	
Rassman, et al	

CLAIMS AS FILED - PART I

FOR	NO. FILED	NO. EXTRA	SMALL ENTITY RATE	SMALL ENTITY FEE		OTHER THAN A SMALL ENTITY RATE	OTHER THAN A SMALL ENTITY FEE
BASIC FEE				$170	OR		$340
TOTAL CLAIMS	40 - 20 =	20	X6 =	$120	OR	X12 =	$
INDEP. CLAIMS	4 - 3 =	1	X17 =	$17	OR	X34 =	$
MULTIPLE DEPENDENT CLAIM PRESENT			X55 =	$55	OR	X110 =	$
			TOTAL	$362	OR	TOTAL	$

If the difference in col. 1 is less than zero, enter "0" in col. 2

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(1) CLAIMS REMAINING AFTER AMENDMENT		(2) HIGHEST NO. PREVIOUSLY PAID FOR	(3) PRESENT EXTRA
TOTAL	* 71	MINUS	** 40	= 31
INDEP.	* 4	MINUS	*** 4	=
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

SMALL ENTITY RATE	SMALL ENTITY ADDIT. FEE		OTHER THAN A SMALL ENTITY RATE	OTHER THAN A SMALL ENTITY ADDIT FEE
6	$	OR		
X10 =	$	OR	X10 =	$ 186
X15 =	$	OR	X30 =	$
X50 =	$	OR	X100 =	$
TOTAL ADDIT. FEE	$	OR	TOTAL	$ 186

AMENDMENT B

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA
TOTAL	*	MINUS	**	=
INDEP.	*	MINUS	***	=
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

RATE	ADDIT FEE		RATE	ADDIT FEE
X5 =	$	OR		
X10 =	$	OR	X10 =	$
X15 =	$	OR	X30 =	$
X50 =	$	OR	X100 =	$
TOTAL ADDIT. FEE	$	OR	TOTAL	$

AMENDMENT C

	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA
TOTAL	*	MINUS	**	=
INDEP.	*	MINUS	***	=
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				

RATE	ADDIT. FEE		RATE	ADDIT FEE
X5 =	$	OR		
X10 =	$	OR	X10 =	$
X15 =	$	OR	X30 =	$
X50 =	$	OR	X100 =	$
TOTAL ADDIT. FEE	$	OR	TOTAL	$

* If the entry in Col. 1 is less than the entry in Col. 2, write "0" in Col. 3.

** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest No. Previously Paid For" (Total or Indep.) is the highest number found in the appropriate box in Col. 1.

PTO-1130 (REV. 8-87)

PALM III APPLICATION FILE DATA CODING SHEET

U.S. DEPARTMENT OF COMMERCE–PATENT & TM OFFICE

PREPARED BY: BC DATE: 10-1-87

FORMAT NO. 2 Serial No.	TYPE APPL	FILING DATE (Month / Day / Year)	SPECIAL HANDLING	GROUP ART UNIT	CLASS	SHEETS OF DRAWINGS	ASGT?	TOTAL CLAIMS	INDEPENDENT CLAIMS	SMALL ENTITY?	FILING FEE RECEIVED	SECURITY CASE?	FOREIGN LICENSE?
07	1	09 / 10 / 87		236	364	10	Y	36	4	2	362	N	Y

096027

FORMAT NO. 3 ATTORNEY DOCKET NUMBER (12 spaces): 924.1

Atty.'s Reg. Nos. ☐ APPL. PAPERS ☐ CODING SHEET

FORMAT NO. 4 Applicant's Name & Address ☐ APPL. PAPERS ☐ CODING SHEET

FORMAT NO. 5 Title of Invention ☐ APPL. PAPERS ☐ CODING SHEET

FORMAT NO. 6&7 Correspondence Address ☐ APPL. PAPERS ☐ CODING SHEET

FORMAT NO. 8

	RECORD	CONTINUITY CODE	PARENT APPLICATION SERIAL NUMBER	PARENT FILING DATE (Month / Day / Year)	STATUS CODE	PARENT PATENT NUMBER
	801		0			
	802		0			
	803		0			
	804		0			
	805		0			
	806		0			
	807		0			
	808		0			
	809		0			
☐ MORE ON SUPPLEMENTAL CODING SHEET	810		0			

FORMAT NO. 9

	RECORD	COUNTRY CODE	PCT/FOREIGN APPLICATION SERIAL NUMBER	FILING DATE (Month / Day / Year)
	901			
	902			
	903			
	904			
	905			
	906			
☐ APPLICATION PAPERS	907			
	908			
	909			
☐ MORE ON SUPPLEMENTAL CODING SHEET	910			

FOREIGN PRIORITY CLAIMED? ☐ YES ☐ NO