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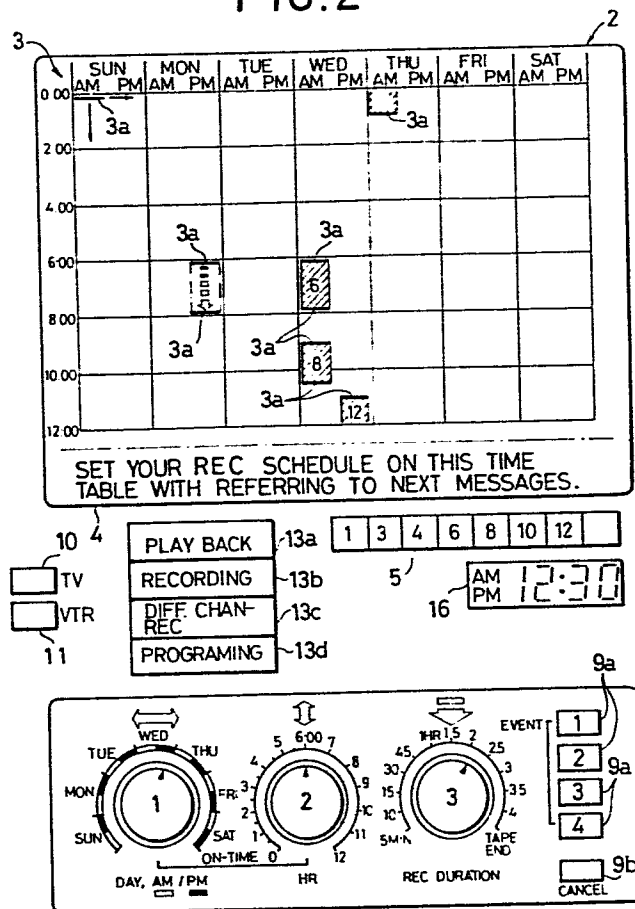
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54 **Television program timer apparatus.**

57 A TV program timer apparatus employs a CRT display (2) on which a timetable (3) is displayed to enable a user to schedule programs to be recorded while guided by messages displayed on the CRT display (2) below the timetable (3).

FIG. 2



TELEVISION PROGRAM TIMER APPARATUS

This invention relates to television (TV) program timer apparatus suitable for performing scheduled recording of television programs. (Although this specification refers to television programmes as well as computer programs, the spelling "program" has been used for both in
5 this specification to maintain agreement with the spelling used in the stored and displayed messages referred to below.)

Known video tape recorder (VTR) timers which are programed while the user observes a digital display have the following disadvantages:

- 10 (1) The operating procedures are complicated.
- (2) The ON-times and the OFF-times are preset using a plurality of buttons, frequently resulting in erroneous presetting.
- (3) The user cannot check whether or not the timer is properly set.
- (4) Since a digital display is used, it is difficult for the user to check the
15 preset time durations. In particular, preset time durations may conflict.

To eliminate these drawbacks, an analogue clock display timer has been proposed. However, the analogue timer cannot serve as a multiprogram timer which is usable to preset times for a plurality of
20 television programs extending over several days.

According to the present invention there is provided a TV program timer apparatus comprising:

a system controller;

clock means connected to said system controller for generating current time
25 signals; and

input means connected to said system controller for generating program data by manual operation;

characterised by:

display control means connected to said system controller for generating
30 display signals to be supplied to a cathode ray tube display, said display signals including a timetable and also messages from said system controller to a user.

The invention will now be described by way of example with

reference to the accompanying drawings, throughout which like parts are referred to by like references, and in which:

Figure 1 is a perspective view of a TV/VTR apparatus to which an embodiment of TV program timer apparatus according to the invention is applied;

Figure 2 is a plan view of a part of the TV/VTR of Figure 1;

Figure 3 is a flow chart for explaining the steps of recording a TV program;

Figure 4 is a flow chart for explaining the steps of performing DIFF. CHAN-REC (different channel recording);

Figures 5A and 5B are a flow chart for explaining the steps of timer programing; and

Figure 6 is a block diagram of the TV/VTR apparatus having a TV program timer apparatus, as shown in Figure 1.

Referring to Figures 1 and 2, a timetable 3 for timer recording (Figure 2) is displayed on a cathode ray tube (CRT) display panel 2 of a TV receiver 1 (Figure 1). A message or telop is superimposed at a lower portion 4 of the CRT display panel 2 to display operating steps of timer programing. For example, as shown in Figure 2, a message "Set your REC schedule on the timetable with referring to next messages." is displayed.

A required number of TV channel buttons 5 are arranged below the CRT display panel 2. A program timer operation console 8 is arranged on a control panel 7. As shown in Figure 2, the program timer operation console 8 comprises time set dials -1, -2 and -3 for respectively presetting "day" and "AM/PM", "ON time" and "REC duration"; a plurality of event switches (four in this embodiment) 9a for respectively presetting the events; and a cancel button 9b. A cover (not shown) is mounted to cover the program timer operation console 8. The user opens the cover when the program timer operation console 8 is to be used to enter timer programing data.

A power switch 12 (Figure 1), a TV button 10 (Figure 12) and a VTR button 11 (Figure 12) are arranged on the control panel 7. The TV button 10 is used to select the TV mode, and the VTR button 11 is used to select the VTR mode. Function buttons 13a to 13d are arranged near the TV and VTR buttons 10 and 11 so as to respectively perform "playback", "recording", "different channel recording" and "programing" in the VTR mode. Furthermore, VTR operation buttons 14, a tape cassette insertion port 15,

and a digital display unit 16 are arranged on the panel 7, as shown in Figure 2.

TV picture recording in the TV/VTR apparatus will be described with reference to Figure 3.

5 When the user turns on the power switch 12, a message "For VTR mode, press VTR button." is displayed together with time display "1.30" on the lower portion 4 of the CRT display panel 2. In this case, the user presses the TV button 10, the displayed contents then disappear from the VTR display panel 2, and a TV picture appears thereon. Unless the user
10 presses the TV button 10, the message and the time display disappear in three seconds.

 When the user presses the VTR button 11, a message "Select one of modes: PLAY/REC/DIFF. CHAN-REC/PROGRAMING." appears on the CRT display panel 2. When the user presses the REC mode button 13b and the
15 corresponding LED is turned on, a message "Select TV channel button." is displayed, and at the same time a TV picture appears on the CRT display panel 2. When the user selects a desired one of the TV channel buttons 5, a message "Insert cassette." appears on the CRT display panel 2. When the cassette is inserted and a REC safety tab sensor is turned on, a message
20 "Press REC button." appears on the CRT display panel 2. When the user then presses the REC button of the VTR operation buttons 14, a message "Now recording." is displayed at the lower portion 4 of the CRT display panel 2. However, when the REC safety tab sensor is not turned on, a message "Change cassette." appears on the CRT display panel 2. When the
25 user ejects the currently mounted cassette and inserts a blank cassette, recording is started. It should be noted that the message "Now recording." disappears in about three seconds.

Different channel recording in the TV/VTR apparatus will be described with reference to the flow chart in Figure 4.

30 If the user wishes to record a different program while watching a TV program on a third channel (channel 3), the message "Select one of modes: PLAY/REC/DIFF. CHAN-REC/PROGRAMING." appears on the CRT display panel 2 upon depression of the VTR button 11. When the user presses the different channel recording button 13c, the message "Insert cassette."
35 appears on the CRT display panel 2. When the user inserts the cassette and a REC safety tab sensor is turned on, the message "Select TV channel

button." appears on the CRT display panel 2. When the user selects a sixth channel, the sixth channel LED is turned on at an intensity lower than that of the third channel LED. When the REC button of the VTR is turned on, the message "Now recording on 6th channel." appears on the CRT display panel 2.

When the REC safety tab is detected to be cut off, the same operation as in the flow chart of Figure 3 is performed.

Timer programming will now be described with reference to the flow chart in Figures 5A and 5B.

When the user turns on the VTR button 11, the message "Select one of modes: PLAY/REC/DIFF. CHAN-REC/PROGRAMING." appears on the lower portion 4 of the CRT display panel 2. The user then presses the "PROGRAMING" button 13d. A message "Open the cover of program timer operation console." appears at the lower portion 4 of the CRT display panel 2. When the cover of the program timer operation console 8 is opened, the timetable is displayed on the CRT display panel 2, as shown in Figure 2. At the same time, the message "Turn dial -1 for designating day of week and AM/PM." appears on the CRT display panel 2.

Referring to Figure 2, the user then turns the dial -1 in the program timer operation console 8 to set the dial -1 in a desired day (AM/PM) position. For example, the user turns the dial -1 to set it in the Wednesday position. During this operation, a cursor 3a moves from the Monday (0:00) position. A message "Turn dial -2 for designating ON-time." appears on the lower portion 4 of the CRT display panel 2. The user then turns the dial -2 (Figure 2) to set the ON time to be 6:00. The cursor 3a moves downward from the 0:00 position and stops at the 6:00 position. A message "Turn dial -3 for designating REC duration." then appears on the lower portion 4 of the CRT display panel 2. The user then sets the dial -3 (Figure 2) to set the REC duration to be two hours. Another cursor 3a moves from the 6:00 position to the 8:00 position as indicated in the time range between 6:00 and 8:00 on Monday. A message "Select TV channel button." appears at the lower portion 4 of the CRT display panel 2. When the user presses the sixth channel (that is, channel 6) of the TV channel buttons 5, a numeric value "6" is displayed in an area corresponding to the time range between 6:00 and 8:00. A message "Press even SW-1." appears on the lower portion 4 of the CRT display panel 2. When the user presses the event SW-1 of the event

switches 9a, the time range between 6:00 and 8:00 on Wednesday is highlighted in green. A telop "Insert cassette, if programing is over." appears at the lower portion 4 of the CRT display panel 2. The user then inserts a blank cassette in position. When the cassette-IN sensor is turned on, a message "Close console cover." appears on the lower portion 4 of the CRT display panel 2. When the user closes the console cover, the console cover switch is turned off. As a result, a message "Your REC schedule is reserved at 6:00 for 2-HRS on 6th channel." appears on the lower portion 4 of the CRT display panel 2. Thus the schedule data is stored in a random access memory (RAM). The timetable and the scheduled contents disappear in a few seconds. Thus the user can visually check the REC schedule.

In the above operation, if the cassette is not inserted when the user presses the event SW-1, a message "You can reserve another REC schedule." appears at the lower portion 4 of the CRT display panel 2. If the user wishes to reserve another REC schedule, he uses the dial -1, the dial -2, the dial -3 and an event SW-2 of the event switches 9a. In this embodiment, four event switches 9a are provided, so that the user can reserve a maximum of four REC schedules.

The TV/VTR apparatus shown in Figure 1 has a microprocessor for executing processing as shown in Figures 3 to 5. The microprocessor executes the flows shown in Figures 3 to 5 upon operation of the control panel 7. In particular, the user can perform timer programing while observing the messages appearing on the CRT display panel 2. In this manner, the user can follow the instructions appearing on the CRT display panel. When timer programing is completed, the program contents and ON times are displayed on the CRT display panel 2. The machine (microcomputer) signals the completion of timer programing to a user (operator). In other words, the user can perform timer programing in a conventional manner. If the user operates erroneously despite the messages given by the microcomputer, the microcomputer signals such an erroneous operation to the user. The user can then operate correctly.

Timer programing can be repeated by the number of times corresponding to the number of event switches 9a (four in this embodiment). The weekly timetable (Figure 2) is displayed on the CRT display panel 2, so that the user can reserve TV programs over the following several days. The cursor 3a is moved in accordance with the messages of the flow chart in

Figure 5, and the programming contents such as day, AM/PM, ON-time, REC duration, and channel number can be displayed in the analog form as shown in Figure 2. When the user presses event SW-1 (first time) of the event switches 9a, the designated time range is highlighted in green. The user can
5 check timer programming as if the schedule were written in a pocketbook. In particular, mis-programing which reserves conflicting time ranges can be prevented. Since the preset time can be digitally displayed at the digital display unit 16, the start point (ON time) and the end point (OFF time) of each bar in the timetable 3 displayed on the CRT display panel 2 need not be
10 accurately read since the time schedule can also be preset at the digital display unit 16.

When timer programming is completed, programed data can be read out as needed using a paging function, so that the timetable and the reserved time ranges (bars) can be displayed.

15 A data processing section of the TV/VTR apparatus having the timer programming function shown in Figure 1 is shown in Figure 6.

The data processing section has a microprocessor which comprises a control processing unit (CPU) 18, a read only memory (ROM) 19 and a RAM 20. The programs which perform the data processing steps as described
20 above are stored in the ROM 19 and the RAM 20. The TV channel buttons 5, the event switches 9a, the TV button 10, the VTR button 11, the power switch 2, the function buttons 13a to 13d, the time set dial -1, the time set dial -2, the time set dial -3, and the VTR operation buttons 14 shown in Figures 1 and 2 are coupled to the CPU 18 and the RAM 20 through an
25 interface circuit 21, a buffer 22 and a data bus 23. Address signals for accessing the buttons and switches are generated from the CPU 18 and are supplied to the interface 21 through an address bus 24 and an address decoder 25. The operation data of the TV, the VTR and the timer are fetched in the CPU 18 and are stored in the RAM 20. The ON/OFF
30 operation of the TV channel lamps and other monitor lamps is controlled by the address data which is supplied from the CPU 18 to an interface 26 through the address bus 24 and the address decoder 25.

The messages, timetable 3 and the cursor 3a are displayed in accordance with the contents stored in a character RAM 27 and a graphic
35 RAM 28 each of which has a memory area corresponding to the TV display panel. The input data associated with timer programming are supplied from

the interface 21 to the CPU 18 and the RAM 20. The input data are then processed under the control of the CPU 18 and are stored such that the character data is stored in a character RAM 27 and the graphic data is stored in a graphic RAM 28. The write address data is supplied from the CPU 18 to the RAMs 27 and 28 through the address bus 24 and a selector 29. However, when the input data are not supplied to the RAMs, address data are supplied from a CRT controller 30 to the RAMs 27 and 28 through the selector 29, so that the contents are continuously read out from the RAMs 27 and 28 to display the stored contents on the CRT display panel 2.

ASCII coded data read out from the character RAM 27 is supplied to a character ROM 31 and is converted to a character dot pattern. The outputs from the character ROM 31 and the graphic RAM 28 are mixed by an OR gate 32. An 8-bit parallel signal is then supplied from the OR gate 32 to a parallel/serial (P/S) converter 33. The P/S converter 33 receives the parallel data supplied thereto in response to a clock pulse which has a predetermined period and which is generated from a clock generator 34. The P/S converter 33 then converts the parallel data to a serial video signal. The serial video signal is then supplied from the P/S converter 33 to a monitor TV through a mixer/changeover circuit (MIX/CHGOV) 35. As a result, the display state shown in Figure 2 is obtained.

On the other hand, a TV tuner 37 is set in response to the operation data supplied from one of the TV channel buttons 5 through the data bus 23. The output video signal is supplied from the TV tuner 37 to the mixer/changeover circuit 35 through a demodulator 38. The video output from the demodulator 38 is supplied to a VTR 39. The VTR 39 is connected to the data bus 23 and is controlled in accordance with the operation of the VTR operation buttons 14 and the timer output data read out from the CPU 18 and the RAM 20. A reproduction output from the VTR 39 is supplied to the monitor TV through the mixer/changeover circuit 35.

Outputs from the REC safety tab sensor, a cassette-IN sensor, a dew sensor and a tape-end sensor are supplied to the data bus 23 through an interface 40. At the same time, an interrupt request signal is supplied from an interrupt controller 41 to the CPU 18, so that the individual outputs from the sensors can be processed as needed. The time signal as the reference of timer counting is generated by a clock IC 42 and is supplied onto the data bus 23. The clock set inputs from the time set keys are supplied to the

clock IC 42 through the interface 40.

In the embodiment of Figure 1, in order to perform timer programming at the timetable 3 displayed on the CRT display panel 2, dials (rotary knobs) are used to move the cursors 3a vertically and horizontally. However, the cursor shift mechanism is not limited to this arrangement, but extended to push-buttons (key switches), a joystick, or a write pen. The timer preset apparatus described can be built into a VTR. Alternatively, the timer preset apparatus can be manufactured as an independent unit. In these cases, the timetable 3 and the bar graph indicating the reserved time ranges (Figure 2) can be displayed on a TV receiver connected to the VTR or timer.

Thus in the embodiment, the cursors displayed in the timetable on the CRT display panel can be moved by the time set means of the TV program timer apparatus so as to perform timer programming. Furthermore, the reserved time ranges can be displayed in the form of the bar graph in the timetable, so that the user can visually check the programming state. In addition to these advantages, the operation can be simplified, thereby reducing mis-operation. Moreover, since the user just follows the messages displayed on the CRT display panel, mis-operation is further decreased. The reserved contents are displayed in the form of the bar graph, and timer programming can be simplified. At the same time, the reserved contents are numerically displayed, so that the bar graph display is combined with the numeric display to provide better read-ability. As a result, the user can readily confirm timer programming, preventing erroneous setting operations.

CLAIMS

1. A TV program timer apparatus comprising:
a system controller (18);
clock means (42) connected to said system controller (18) for generating
current time signals; and
5 input means (21) connected to said system controller (18) for generating
program data by manual operation;
characterised by:
display control means (27, 28, 29) connected to said system controller (18)
for generating display signals to be supplied to a cathode ray tube display
10 (2), said display signals including a timetable and also messages from said
system controller (18) to a user.
2. Apparatus according to claim 1 wherein said display signals include
cursor signals to be superimposed on said timetable for indicating reserved
15 times on said timetable.
3. Apparatus according to claim 2 wherein said input means (21)
includes start time setting means (-1, -2) and duration setting means (3),
which are used to control generation of said cursor signals.
20
4. Apparatus according to claim 3 wherein said display signals from said
display control means (27, 28, 29) cause display of said timetable with a
cursor and with said message below said timetable.

FIG. 1

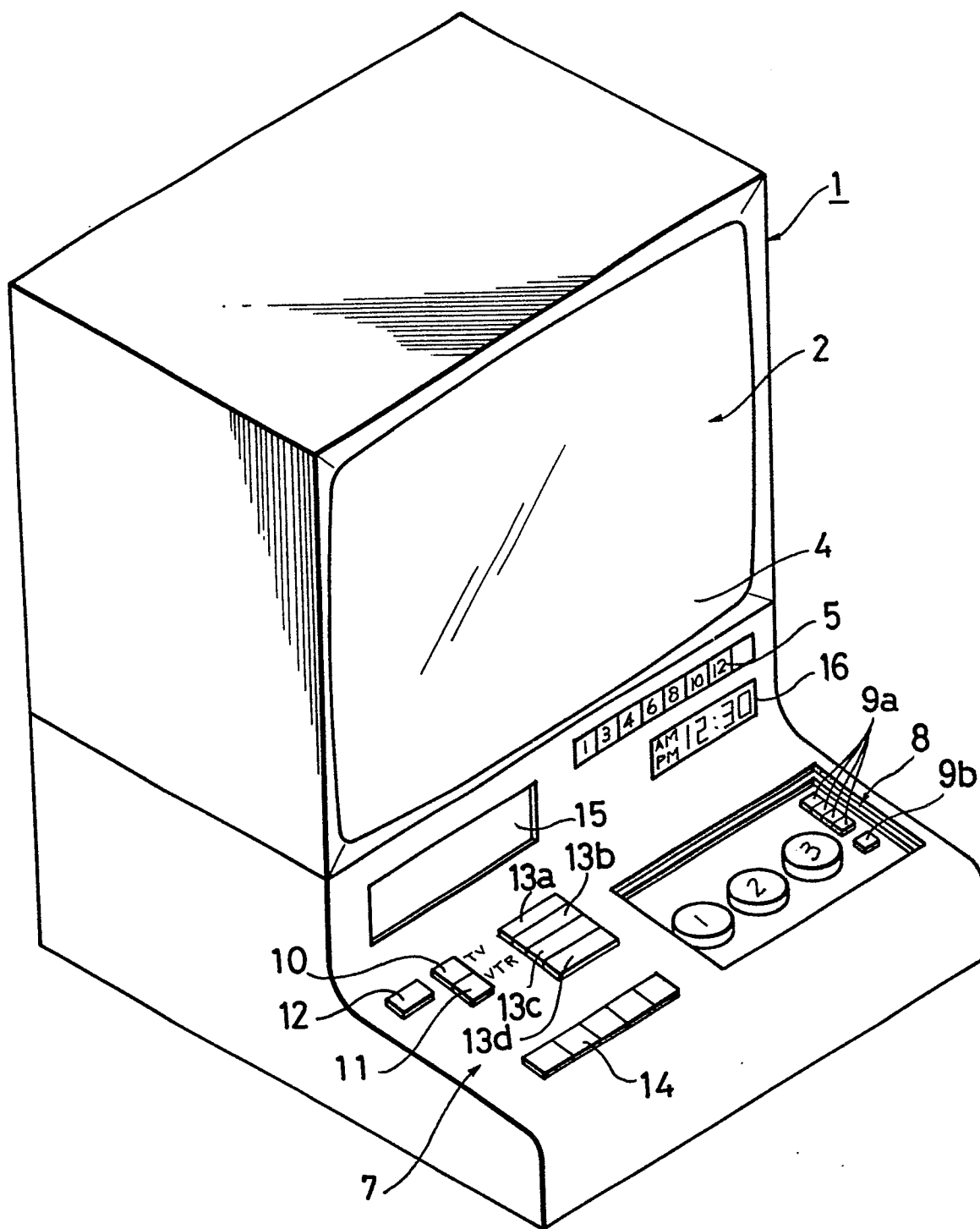


FIG. 2

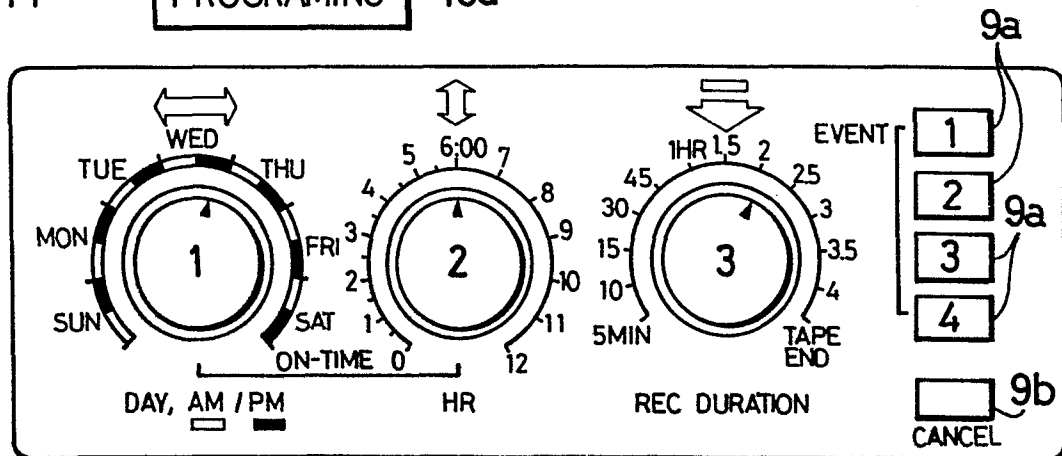
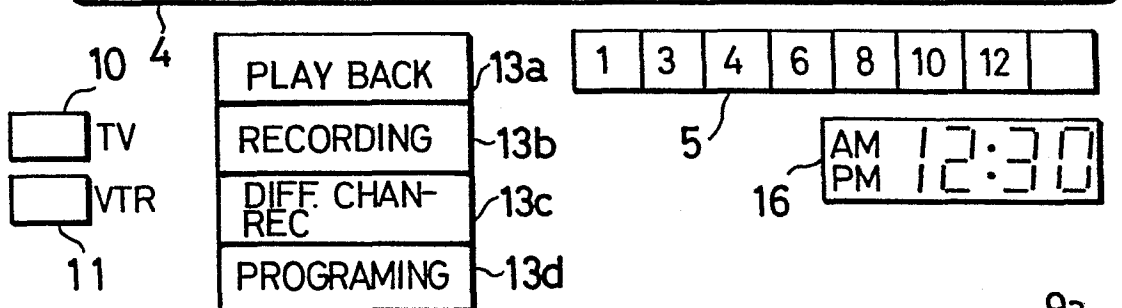
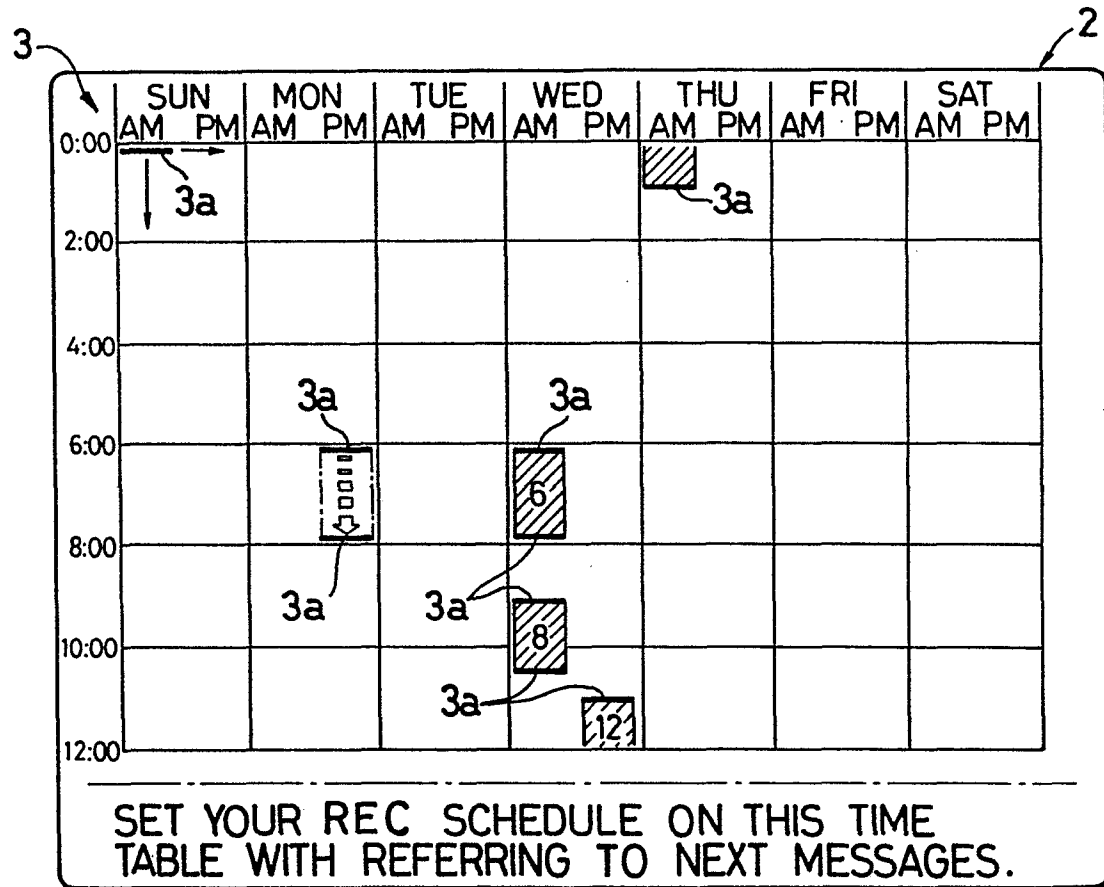


FIG. 3

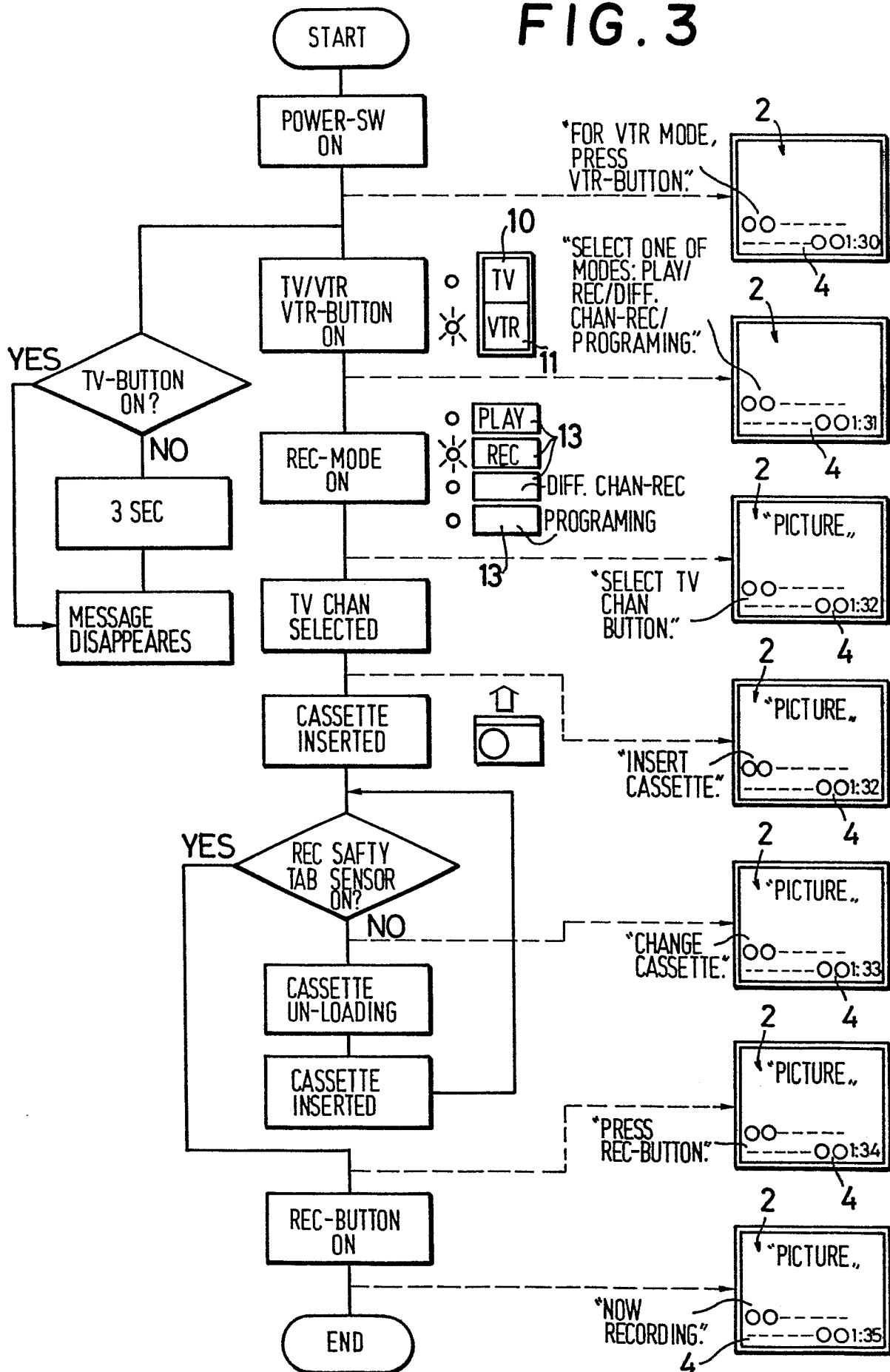


FIG. 4

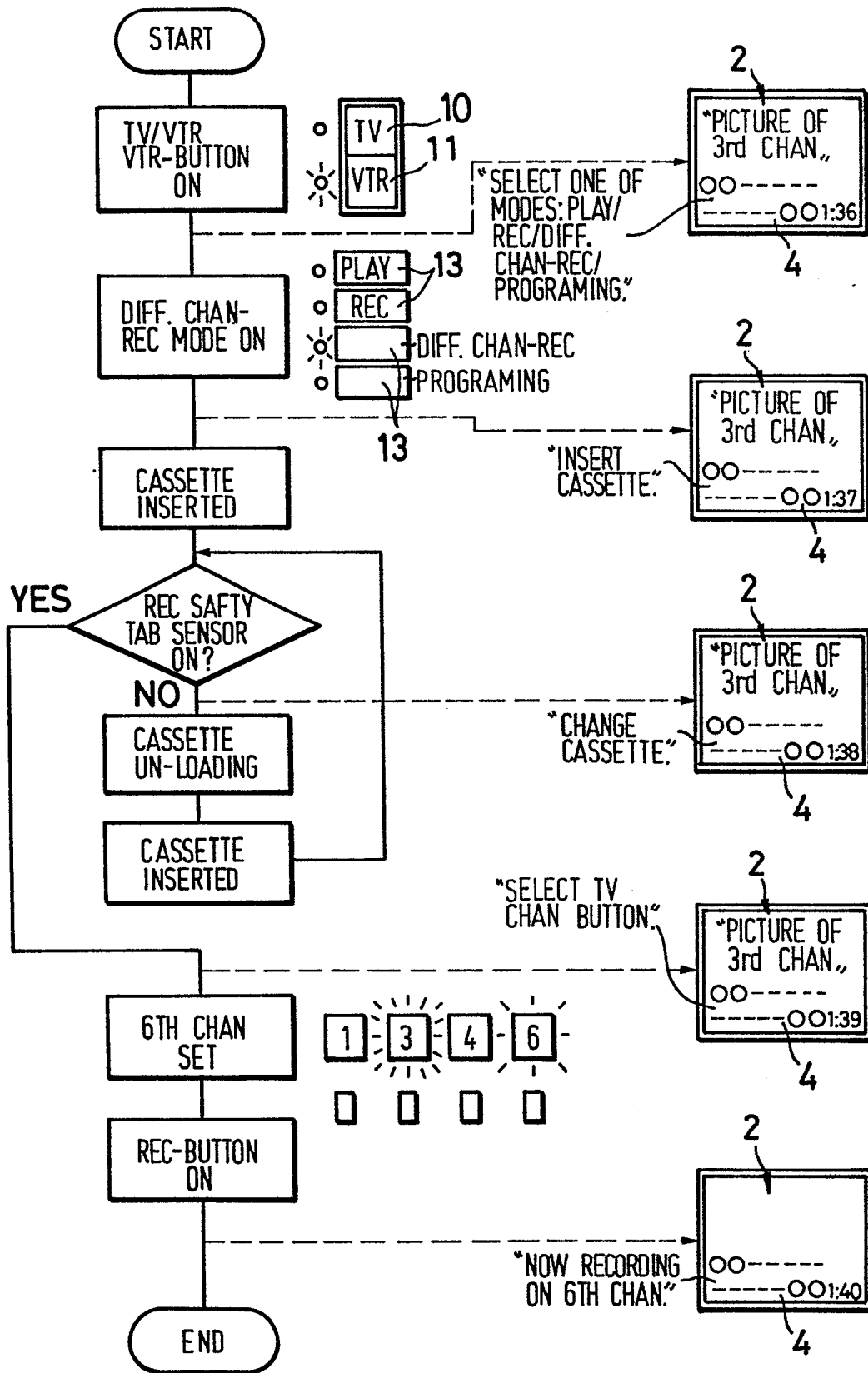


FIG. 5A

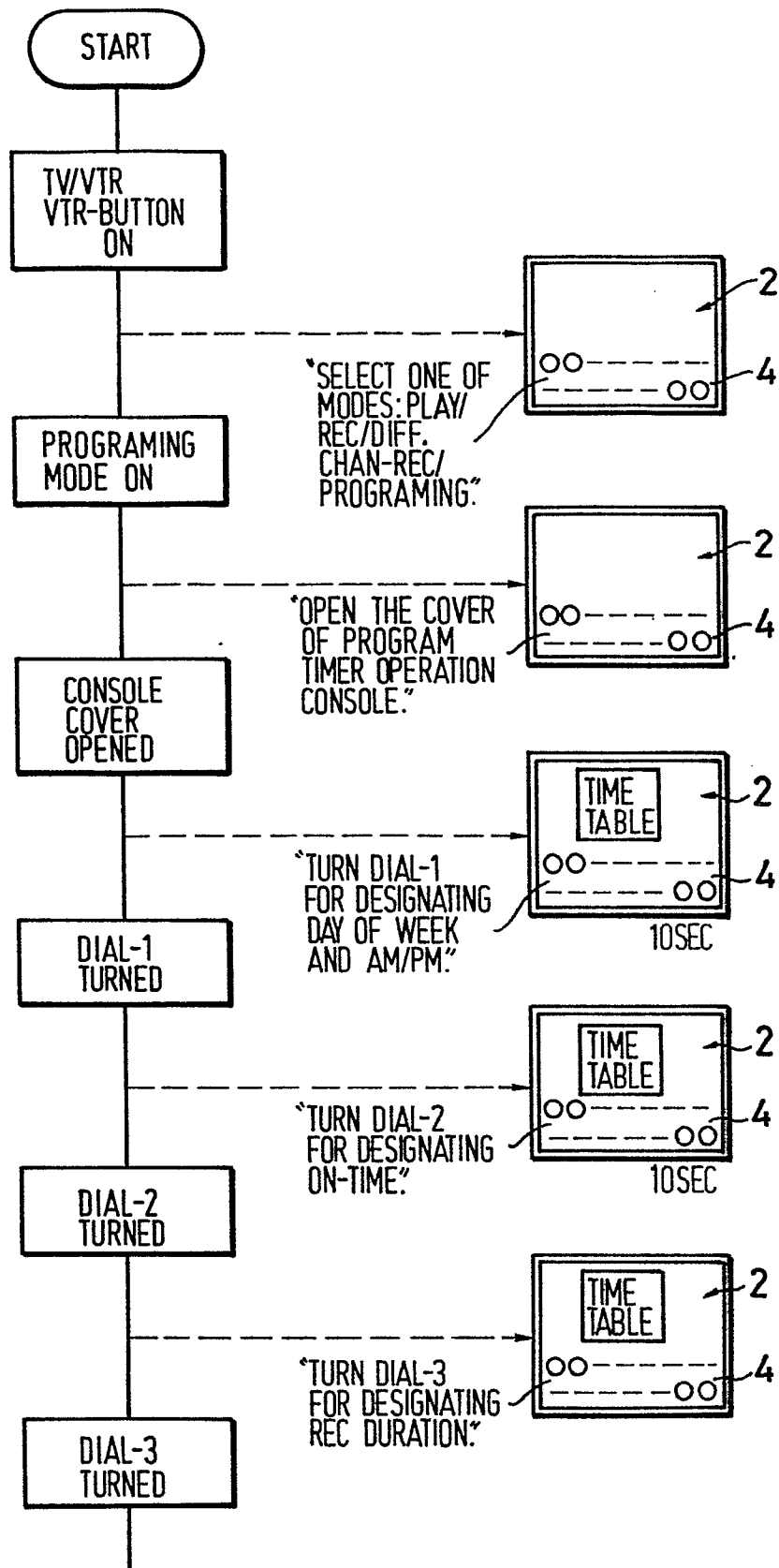
FIG. 5A
FIG. 5B

FIG. 5B

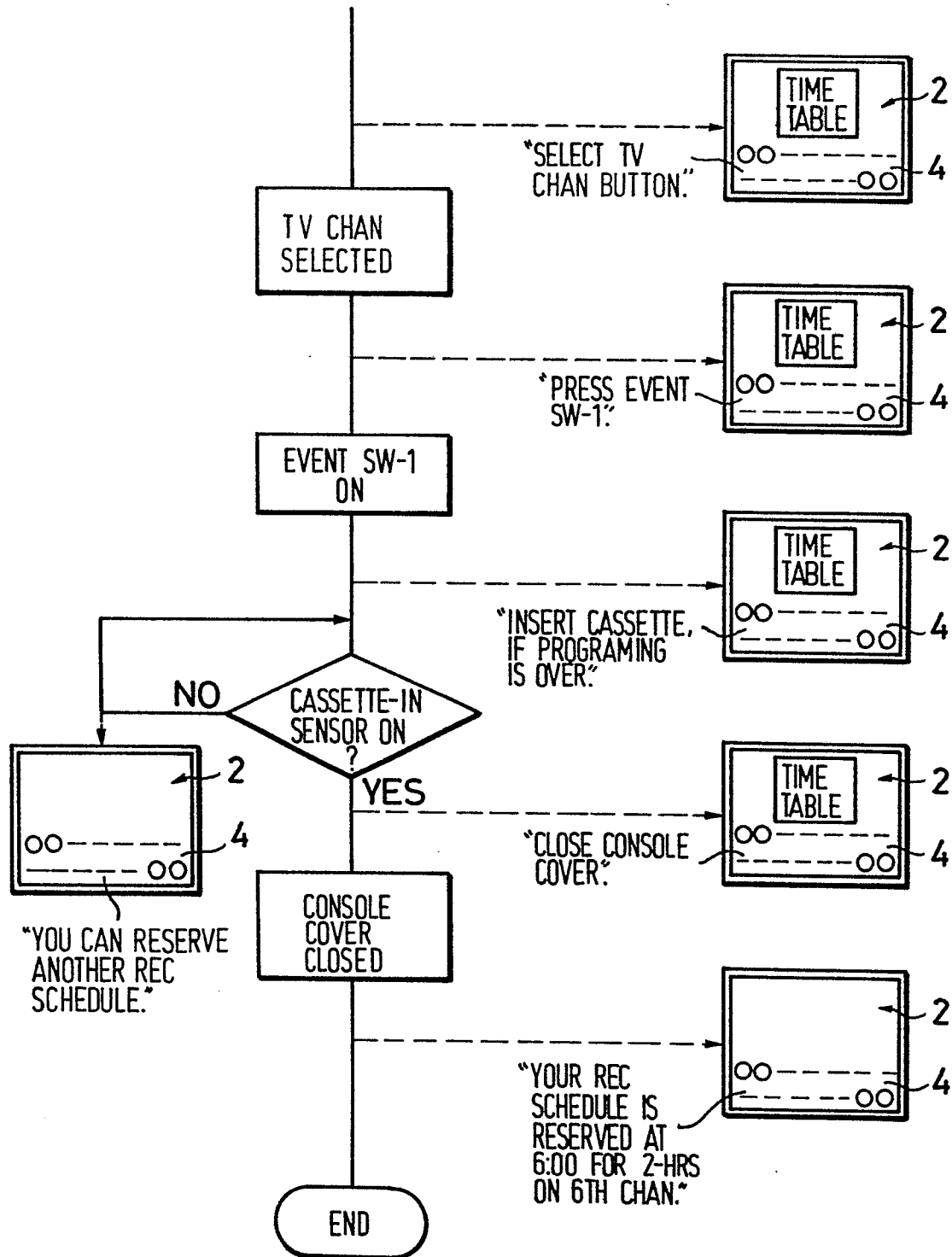
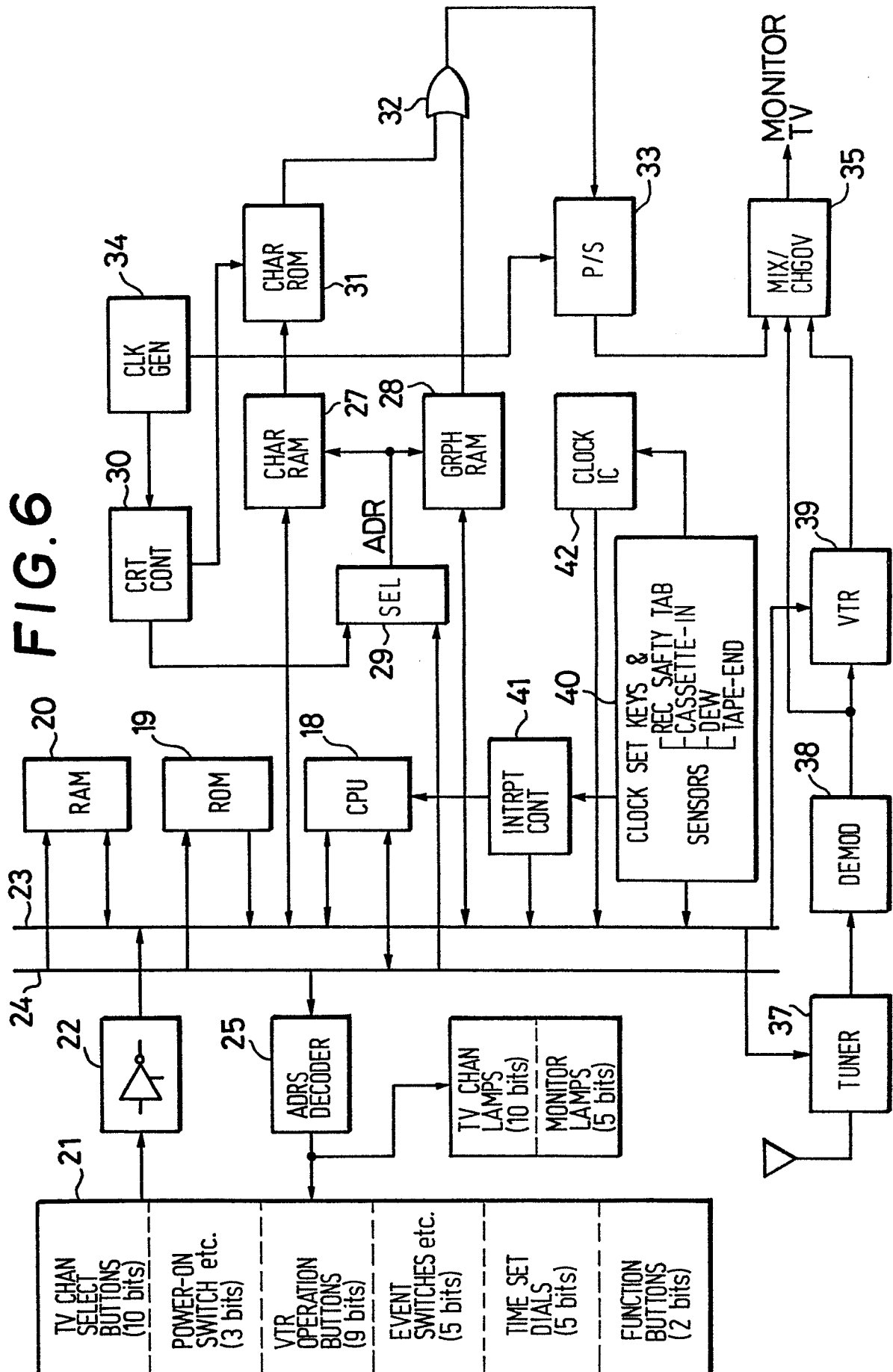


FIG. 6





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	Patent Abstracts of Japan vol. 5, no. 40, 17 March 1981 & JP-55-165038	1	H 04 N 5/44 H 03 K 17/296 G 04 G 15/00
A	--- Patent Abstracts of Japan vol. 5, no. 40, 17 March 1981	2-4	
A	--- US-A-4 088 958 (SUZUKI et al.) * Column 1, lines 43-63; column 2, lines 52-59; claim 1; figures 1, 6 *	1,3	
A	--- GB-A-2 021 886 (INDESIT INDUSTRIA ELETTRODOMESTICI) * Page 2, lines 19-23; page 3, line 56 - page 5, line 20; page 15, lines 20-41; figures 1, 5 *	1	
A	--- US-A-4 325 081 (ABE et al.) -----		TECHNICAL FIELDS SEARCHED (Int. Cl. ³) H 04 N 5/00 H 03 K 17/00 G 04 G 15/00 G 05 B 19/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 07-03-1984	Examiner DUDLEY C.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			