



Europäisches Patentamt
European Patent Office
Office européen des brevets

Publication number:

0 075 026
A1

EUROPEAN PATENT APPLICATION

published in accordance with Art. 158(3) EPC

Application number: **82901003.2**

Date of filing: **02.04.82**

Data of the international application taken as a basis:

International application number:
PCT/JP 82/00095

International publication number:
WO 82/03445 (14.10.82 82/25)

Int. Cl.³: **F 24 C 15/00**, E 05 F 15/20,
G 06 F 3/02, G 06 F 3/14,
G 06 F 3/16, G 09 G 1/06

Priority: **03.04.81 JP 50942/81**
25.05.81 JP 79661/81

Date of publication of application: **30.03.83**
Bulletin 83/13

Designated Contracting States: **DE FR GB**

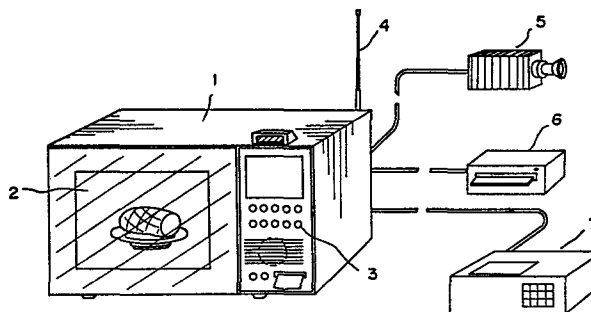
Applicant: **Matsushita Electric Industrial Co., Ltd.**, 1006,
Oaza Kadoma, Kadoma-shi Osaka-fu, 571 (JP)

Inventor: **NAGAMOTO, Shunichi**, 602, Misasagi-cho
Nara-shi, Nara-ken 631 (JP)
Inventor: **ITO, Masao**, 1655-129, Mitsugarasu-cho,
Nara-shi Nara-ken 631 (JP)
Inventor: **KOBAYASHI, Tetsu**, 17-72, Deyashiki-cho,
Nara-shi Nara-ken 630 (JP)
Inventor: **NISHII, Kazunari**, 376, Tsutsui-cho Yamato
koriyama-shi, Nara-ken 639-11 (JP)
Inventor: **MIYAUCHI, Shinji**, 376, Tsutsui-cho Yamato
koriyama-shi, Nara-ken 639-11 (JP)

Representative: **Crawford, Andrew Birkby et al, A.A.**
THORNTON & CO. Northumberland House 303-306 High
Holborn, London WC1V 7LE (GB)

DISPLAY UNIT OF A COOKING APPARATUS FOR SELECTIVELY DISPLAYING IMAGE SIGNALS FROM SEVERAL IMAGE SIGNAL SOURCES.

A cooking apparatus (1) has a display unit (8), which display (8) shows a cooking recipe so as to improve the operational facility of the cooking apparatus and, in addition, can show an image from a TV receiver (4a), a monitoring camera (5), a video-reproducing apparatus (7) or the like, so that the display unit (8) is used for several purposes. The cooking apparatus also has a sound input device (12) and a sound synthesizing device (18) for additionally improving the operational facility.



EP 0 075 026 A1

TITLE MODIFIED

see front page

SPECIFICATION

TITLE: Display Device for Cooking Appliances

TECHNICAL FIELD

5 This invention relates to a cooking appliance equipped with a picture display means such as a cathode ray tube display unit, wherein cooking methods are displayed on the picture display means to improve the operability of the cooking appliance and picture signal inputs from a

10 plularity of picture signal source means, such as a cathode ray tube controller, a television receiver, a monitor camera and a video playback unit, are selectively switched to display them on the picture display means, thus enhancing effective use of the picture display means.

BACKGROUND ART

15 Recently, incorporation of microcomputers into household electric and electronic equipment has progressed to a remarkable extent, giving birth to high-performance, high value-added products. For example, in the field of

20 cooking appliances, it has become possible to execute very complicated cooking sequences by utilizing a microcomputer while attaining satisfactory results.

25 However, in order to improve the performance of cooking appliances, it is important not only to improve cooking performance, as described above, but also to provide for ease of use. Particularly, as performance



is improved by microcomputer control, operation tends to be increasingly complicated, calling for improved operability.

Concerning operability, reference may be made, e.g., to Japanese Patent Application Disclosure No. 68541/1980, which makes proposals for searching for a menu and representing cooking data including the kinds and amounts of materials in visual form.

DISCLOSURE OF THE INVENTION

10 This invention relates to a display device for cooking appliances such as a microwave oven, and provides a cooking appliance wherein cooking methods are displayed on such a picture display means as a cathode ray tube display unit to improve the operability of the appliance, while with
15 cooking not called for, picture signals from a plurality of picture signal sources, such as a television receiver, a monitor camera and a video playback unit, are selectively switched to display them on the picture display means, thus adapting the appliance for multipurpose use.

20

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a cooking appliance, showing an embodiment of the present invention;

Fig. 2 is an enlarged perspective view of the
25 principal portion of the appliance;

Fig. 3 is a system diagram of said appliance;

Fig. 4 is a side view, partly broken away of the

appliance;

Fig. 5 a, b, c, d, e, f and g shows displays on a screen, illustrating the operation of a display device for the cooking appliance;

5 Fig. 6 is a block diagram of the appliance;

Fig. 7 is a block diagram of the appliance;

Fig. 8 is a block diagram of the appliance; and

Fig. 9 is a block diagram of the appliance.

10 BEST MODE OF CARRYING OUT THE INVENTION

Fig. 1 is a perspective view, wherein 1 denotes a cooking appliance body and 2 denotes a forwardly pivotal door, having a viewing window through which the food in the oven can be seen. The numeral 3 denotes an operating panel constituted of a cathode ray tube (hereinafter referred to CRT), a keyboard, speaker sound openings, a simple printer, a microphone, etc. The numeral 4 denotes a television receiving antenna; 5 denotes a monitor camera; 6 denotes a floppy disk device; and 7 denotes video tape recorder (hereinafter referred to as VTR): these are connected to a connecting section (not shown) provided on the back of the oven body.

Fig. 2 is an enlarged view of the operating panel. The numeral 8 denotes a CRT for displaying characters, pictures and patterns. The numeral 9 denotes a keyboard having 12 keys 9a-9l of various functions. The numeral 10 denotes speaker sound openings formed in the cooking

appliance body 1. The numeral 11 denotes a simple printer capable of hard-copying data displayed on the CRT screen, as needed. The numeral 12 denotes a voice input device such as a microphone, which controls cooking appliance by voice inputs.

Fig. 3 is a system diagram of a cooking oven control device. The numeral 13 denotes a microprocessor having 8-bit or 16-bit processing capacity, forming the nucleus of oven control. The numeral 14 denotes a main memory unit constituted of a ROM part having an overall control program stored therein and a RAM part for the writing and reading of data. The numeral 15 denotes a bus for transferring signals, which is constituted of an address bus, a data bus and a control bus. The numeral 16 denotes a voice recognition unit which recognizes a voice input from the voice input device 12 such as a microphone and informs the microprocessor what the voice input is about. The numeral 17 denotes an interface for the simple printer 11. The numeral 18 denotes a synthesizer which, as needed, synthesizes a sound specified by the microprocessor 13 and drives a speaker 19. The numeral 20 denotes a door control unit for automatically opening the door 2; for example, if the user says, "Open the door" these spoken words are recognized by the voice recognition unit 16 and the microprocessor 13 signals the door control unit 20 to open the door, whereupon the door control unit 20 automatically opens the door. Fig. 4 shows an example of



a door opening mechanism. The numeral 30 denotes a solenoid adapted to driven by the door controller 20. When the solenoid 30 is driven, a lever 31 is turned downwardly around the axis of a pivot 32, raising a hook 34 installed on the door, until it is disengaged from a fitting body 33 on the oven, whereupon the door 2 opens. The numeral 35 denotes a spring which produces a fitting force between the hook 34 and the fitting body 33.

The numeral 21 denotes an interface for driving a heater, e.g. a magnetron 22 for the cooking oven. The numeral 23 denotes an interface for the keyboard 9. The numeral 24 denotes a CRT controller which produces a video signal to write to a refresh memory 25 CRT picture display data transferred by the bus 15 and to display said data on the CRT screen. The numeral 26 denotes an interface for the floppy disk device 6. The numeral 27 denotes an interface for a switching device 28 adapted to selectively switch video signals from the CRT controller 24, monitor camera 5, VTR 7 and TV receiver 4a and transfer them to the CRT 8. The numeral 29 denotes an interface for controlling the monitor camera 5, VTR 7 and television receiver 4a.

The operation of the invention arranged in the manner described above will now be described.

At the start of cooking, the user searches for a desired menu. Pressing the "COOK" key 9a on the keyboard 9

produces a character display, as shown in Fig. 5 a, on the CRT screen. This is a category list for selection of a category for cooking. The numeral 36 denotes a pointer display body which, when the function selection keys 9c and 9d called "SELECT" keys are pressed, is moved to a desired function (cooking category) position to selectively set such function. The key 9c is a reverse function selection key used to move the pointer display body 36 in the reverse direction, and the key 9d is a forward function selection key.

This completes the selection of cooking category, and the next step is to select a desired one from among the menus contained in the selected category. The key 9i is a picture scroll key called "STEP" key and, when pressed, produces a character display, as shown in Fig. 5 b. This is a menu list contained in said selected category. In this case also, the use of the "SELECT" keys 9c and 9d moves the pointer display body 36 to a desired menu, whereby the latter is selected and set, and at the same time a state which makes possible the execution of the cooking sequence is established.

It is now possible to start cooking by pressing the "START" key 9j, but a video picture demonstrating the expected result of the selected menu can be obtained, as shown in Fig. 5 c, by pressing the "STEP" key 9i.

Subsequently, pressing the "STEP" key 9i produces a character display showing a list of materials needed

- 7 -

for making the selected menu, as shown in Fig. 5 d.

At this time, if the "PRINT" key 9l is pressed, the list of materials depicted on the CRT 8 will be printed out by the printer 11.

5 Further, when the "STEP" key 9i is pressed, information is displayed in character form teaching the cooking sequence of the selected menu, as shown in Fig. 5 e.

Further, when the "STEP" key 9i is pressed, a video picture- showing the cooking sequence of the selected
10 menu is sent from the VTR 7 and displayed. In this case, a concurrent explanation in sound form will facilitate the understanding.

In addition, the key 9i is a forward picture scroll key for renewing the content of display on the screen in
15 the forward direction, and the key 9h is a reverse picture scroll key for revival in the reverse direction.

Further, if the picture search key 9b called "SEARCH" key is pressed subsequent to the selection of the desired function (cooking category) by said "COOK" key 9a and
20 function selection keys 9c and 9d, video pictures demonstrating the expected results of a plurality of menus contained in the selected cooking category will be successively shown on the CRT 8 at fixed intervals of time. When a desired display picture comes out, the user presses the picture
25 stop key 9e called "STOP" key to bring it to a halt. At this time, the menu displayed on the screen is selected and set, and the cooking sequence becomes executable.



After the preparatory operation for cooking described above has been completed, the "START" key 9j is pressed, whereby heating is started and a cooking sequence pattern 37 stored in advance is displayed, as shown in Fig. 5 g.

5 In what seems like a bar graph shown therein, cooking time is represented in the horizontal direction and heating power in the vertical direction. If different colors are used to represent different amounts of heating power, the resulting display system is intuitive and
10 easy to understand.

Furhter, the progress of the cooking sequence can be more visually definitely indicated as by using different colors for the elapsed time portion 39 of the cooking sequence pattern 37 and the other time portion to go or
15 by putting some mark in the portion going on.

Further, it is possible to present the user accurate time counts by providing a timer display section 38 indicating the cooking time in digital form. It is also possible to acoustically report the remaining time by the synthesizer
20 18.

In the above description concerning the picture displays in Fig. 5 a through g, in the character display pictures the picture signal source is principally the semiconductor memory or floppy disk device 6 and in the video pictures
25 the picture signal source in VTR 7.

The operation of the present invention described above, which is difficult to illustrate in drawing form because

- 9 -

it is performed by the microprocessor 13 executing the control program stored in the main memory unit 14, is as shown in Figs. 6 through 9 if represented in block diagram form.

5 Fig. 6 is a block diagram for an explanation of the operation of the picture scroll keys 9h and 9i. Each time the picture scroll keys 9h and 9i are pressed, one of the picture signal sources 41-1 through 41-N is successively addressed by address generating means 40.
10 Picture display data from the selected picture source is transferred to the picture display means 8 and displayed on the screen.

 In addition, the picture signal sources 41-1 through 41-N each have a set of data, and which data should be
15 used is determined by moving the pointer display body 36 by means of the function selection keys 9c and 9d.

 Fig. 7 is a block diagram for an explanation of the operation of the function selection keys 9c and 9d. Each time the function selection keys 9c and 9d are
20 pressed, one of the decode output lines 44-1 through 44-N is selected by decode means 43. The selected decode output line 44-1 through 44-M displays a pointer display

body 8a in the predetermined position on the picture display means 8, and the function execution means 45 executes the predetermined function.

Fig. 8 is a block diagram for an explanation of the pattern display operation for the cooking sequence.

Cooking sequence data 48 stored in the semiconductor memory or floppy disk is selectively set in cooking sequence execution means 46 via the function execution means 45 by the picture scroll keys 9h and 9i and function selection keys 9c and 9d. The content of the cooking sequence is processed by the pattern generating means 47 on the basis of a predetermined picture data format to provide picture display data and written to memory 25 is displayed on the screen of the picture display means 8 by the CRT controller 24.

Fig. 9 is a function block diagram for an explanation of the operation of the picture search key 9b and picture stop key 9a. Pressing the picture search key 9b causes timing means 49 to start, producing, after predetermined intervals of time, a START signal to operate motor drive means 50 and an address renewal signal to cause address counter means 51 count up.

The motor drive means 50 rotates a motor 52 to drive a video tape 53. Denoted by 53-1 is a video signal memory portion and 53-2 is a picture address memory portion. The numeral 54 denotes a video signal read-out head; a read-out video signal is pictured on the picture

display means 8 through an amplifier 55. The numeral 56 denotes a picture address read-out head; a read-out picture address is transferred to address comparison means 58 through an amplifier 57. The address comparison means 58 judges whether or not the read-out picture address agrees with the address value outputted from the address counter 51, and if it agrees, outputs a STOP signal to the motor drive means to stop the rotation of the motor 52 so as to temporarily fix the picture display.

10 After a given period of time, the timing means 49 outputs a START signal and an address renewal signal, whereupon the motor 52 is rotated again, and through the same operation as described above a video signal having the next picture address is pictured on the picture display means 8.

15 With such operation repeated, the video picture is successively renewed.

 Further, if the picture stop key 9e is pressed, the operation of the timing means 49 is stopped, so that no START signal or address renewal signal is outputted, with the picture coming to be held still. The function (menu) corresponding to the display picture at this time can be identified by the address data outputted from the address counter means 51, and the setting of the cooking sequence is effected through the function execution means 25 45. The "TV" key 9i is a key for actuating the television receiver 4a to present a TV picture on the CRT 8. The

"MONITOR" key 9g is a key for actuating the monitor camera 5 to picture on the CRT 8 a picture input from the monitor camera. By these means, it is possible to know whether or not there is a caller at the door or what is going on in the children's room. The "DOOR" key 9k is a key for opening the door 2, whose function is equivalent to the operation for orally opening the door.

As for the voice input function, besides the above function of opening the door 2, it is possible to realize, e.g., the function of switching the CRT picture to one showing the expected result of the menu in Fig. 5 c in response to a voice input "ROAST BEEF."

As described above, the present invention is arranged so that (1) cooking data including a menu, materials and cooking sequence, (2) picture data recorded in the VTR 7 including a picture showing the expected result of the menu and a picture showing the cooking steps, (3) pictures from the TV receiver, and (4) pictures from the monitor camera can be suitably selectively displayed, thus providing a multipurpose multifunction cooking oven control device.

Further, it is possible to obtain a hard copy of the list of materials depicted on the CRT screen from the printer 11 by pressing the "PRINT" key 9l or to report the necessary information in sound form to the user by means of the synthesizer 18.

The door 2 can be opened by a voice input from the voice input device (microphone) 12 or the switching

- 13 -

of the CRT picture can be easily realized, so that an improved-operability cooking oven control device can be provided.

Further, one of the plurality of function displayed on the picture display means 8 such as CRT 8 can be selected by the function keys 9c and 9d called "FUNCTION" keys, and the various items of cooking information on the selected function can be successively displayed on the picture display means 8 for the user by the picture scroll keys 9h and 9i called "STEP" keys.

Further, the cooking sequence is changed into a pattern form for intuitive representation of the progress of cooking, and the cooking time is represented in digital form, so that the accurate cooking time and progress can be reported to the user.

Further, a search for a function (menu) can be made by using the picture search key 9b called "SEARCH" key while viewing the video picture screen, and when a desired function (menu) comes out, it can be selected and set by pressing the picture stop key 9e, so that the cooking sequence can be automatically set.

INDUSTRIAL APPLICABILITY

As has been described so far, the present invention consists in providing a cooking appliance such as a microwave oven with a display device, and picturing cooking means on

BAD ORIGINAL

said display device, thereby allowing the operator to do the cooking smoothly while watching the pictures. Further, it is also possible to control the cooking appliance by the voice input means, and besides being used for picturing the cooking means, the display device can be used to project pictures from the monitor camera and video playback device; thus, it is utilizable for many purposes.

CLAIMS:

1. A display device for cooking appliances, comprising picture display means, a plurality of picture signal source means, and changeover switch means for
5 selectively switching picture signals outputted from said plurality of picture signal source means to input them into said picture display means.

2. A display device for cooking appliances as set forth in Claim 1, wherein a cathode ray tube is used as
10 said picture display means, and a television receiver, a video tape recorder and a monitor camera are used as said plurality of picture signal source means.

3. A display device for cooking appliances as set forth in Claim 1, including keyboard means for operating
15 the changeover switch means.

4. A display device for cooking appliances as set forth in Claim 1, wherein the keyboard means has operating keys corresponding to the various picture signal source means.

20 5. A display device for cooking appliances as set forth in Claim 1, including voice recognition means for actuating the changeover switch means by sounds, and voice input means for inputting voice signals into said voice recognition means.

25 6. A display device for cooking appliances as set forth in Claim 1, including a forwardly openable door, door control means, voice input means, and voice recognition

means, the arrangement being such that a predetermined input from said voice recognition means drives the door control means to open the door.

7. A display device for cooking appliances as set forth in Claim 1, having the picture display means and keyboard means for selecting and setting one of a plurality of functions displayed, e.g. in characters on the picture display means, wherein a pointer display body for selecting and indicating one of the plurality of functions displayed on the picture display means is simultaneously displayed, function selection keys are provided as said keyboard means and each time a key is pressed, the pointer display body is moved in the forward or reverse direction so as to select a function displayed on the screen.

8. A display device for cooking appliances as set forth in Claim 1, including picture display means, cooking sequence execution means, and pattern generating means for picture-wise displaying the content of the cooking execution means in pattern form.

9. A display device for cooking appliances as set forth in Claim 8, wherein in the cooking sequence pattern picture-wise displayed on the picture display means, the portion already executed and the portion to be executed are distinctively distinguishably represented as by colors or shapes.

10. A display device for cooking appliances as set

forth in Claim 8, wherein in addition to the picture-wise represented cooking sequence pattern, the cooking time is digitally displayed on the picture display means and is incrementally or decrementally changed in each unit
5 time.

11. A display device for cooking appliances as set forth in Claim 3, having the keyboard means for selectively switching picture signals outputted from the plurality of picture signal source means to display them on said picture
10 display means, wherein said keyboard means has at least what is called a picture scroll key arranged so that each time it is pressed, one of the plurality of picture signal means is selected in the reverse or forward direction and the picture signal from said selected picture signal
15 means is displayed on the picture display means.

12. A display device for cooking appliances as set forth in Claim 3, having a picture search key for successively taking out a plurality of related picture display data from the picture signal means to successively
20 display them on the picture display means.

13. A display device for cooking appliances as set forth in Claim 3, including a picture stop key whereby when a desired display is made, it is fixed at that scene on the picture display means.

25 14. A display device for cooking appliances as set forth in Claim 11, including, as picture scroll keys, what is called a forward picture scroll key for selecting picture

signal source means one by one in the forward direction each time it is pressed, and what is called a reverse picture scroll key for selecting them one by one in the reverse direction each time it is pressed.

- 5 15. A display device for cooking appliances as set forth in Claim 7, including, as function selection keys, what is called a forward function selection key for moving the pointer display body in the forward direction each time it is pressed to select one of the
- 10 plurality of functions displayed on the picture display means, and what is called a reverse function key for moving the pointer display body in the reverse direction each time it is pressed.

1/11

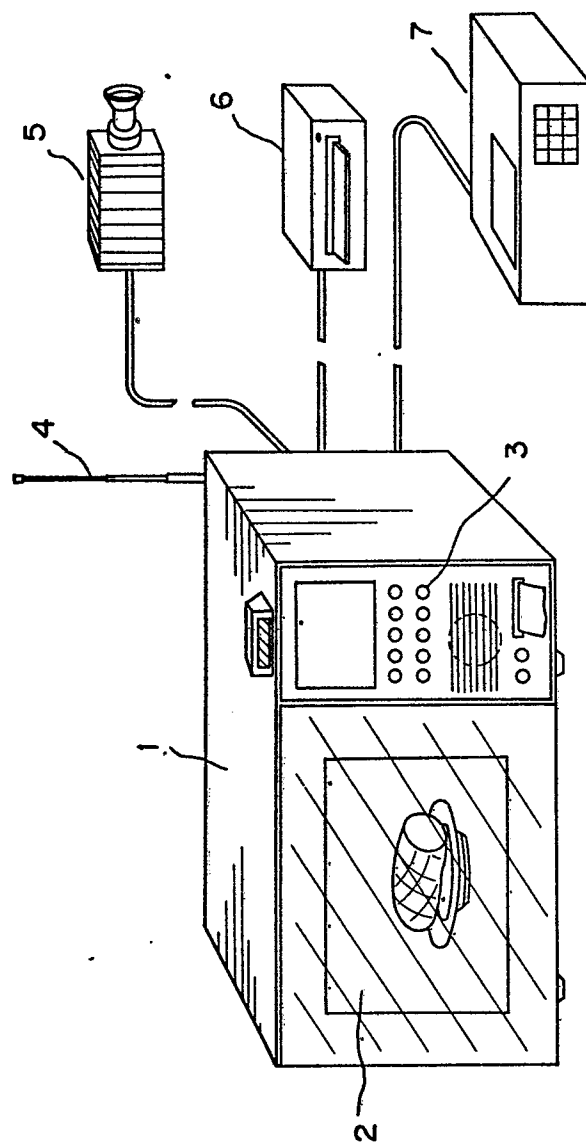
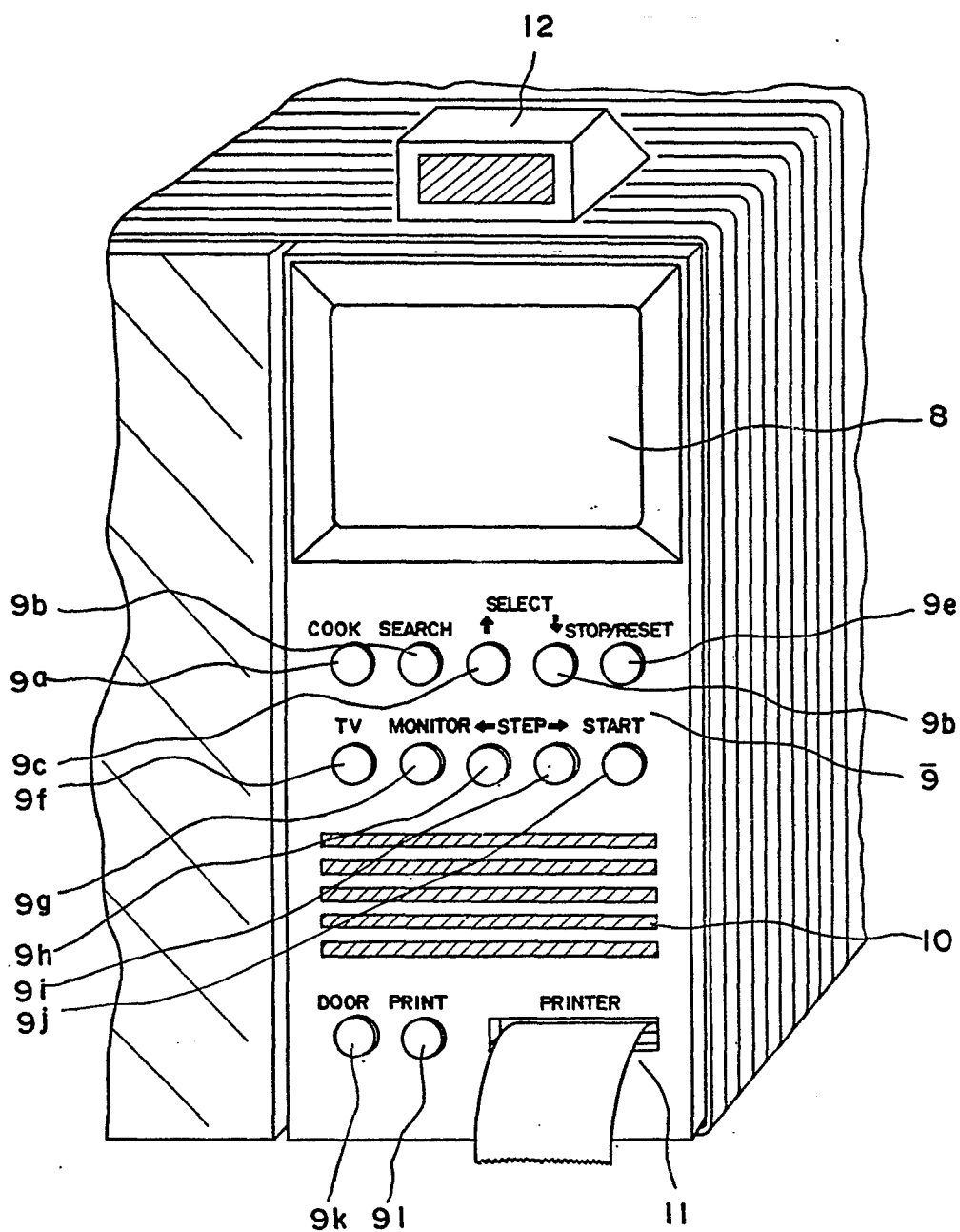


FIG. 1

2/11

FIG. 2



3/11

FIG. 3

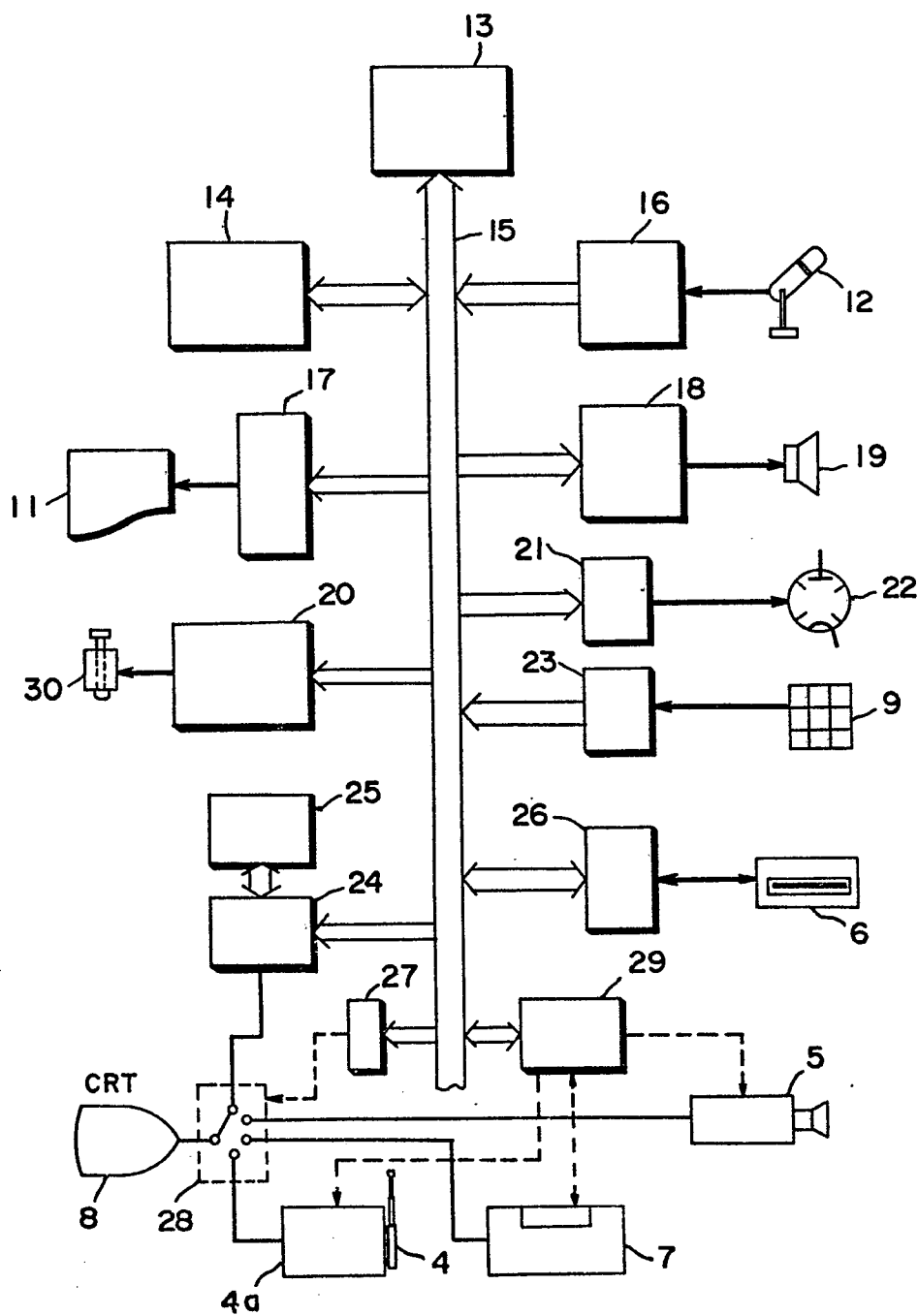


FIG. 4

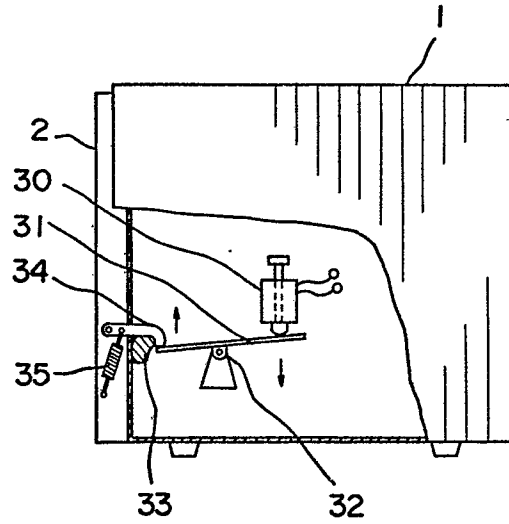


FIG. 5

a

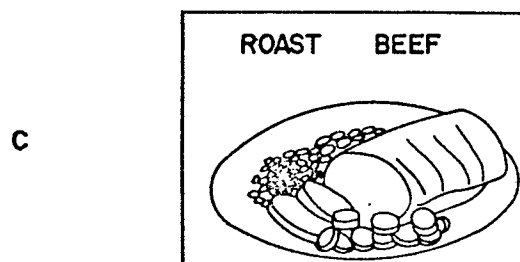
36 *

COOKING CATEGORY	
1	APPETIZERS/BEVERAGES
2	MEAT / POULTRIES
3	-----
4	-----
5	-----
6	-----

b

36 *

MEAT / POULTRIES	
1	ROAST BEEF
2	ROAST CHICKEN
3	-----
4	-----



5/11

FIG. 5

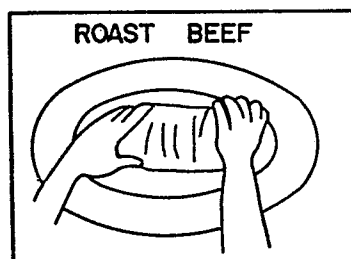
d

ROAST BEEF		
■ BEEF	ROAST	500G
■	-----	100G
■	----	50G

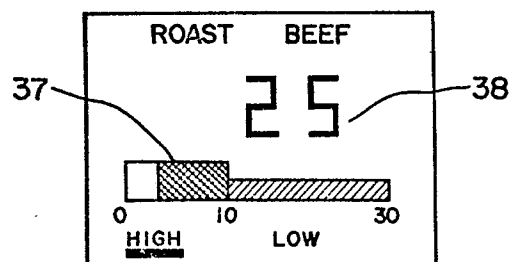
e

ROAST BEEF	
1. BEEF ROAST	----

f

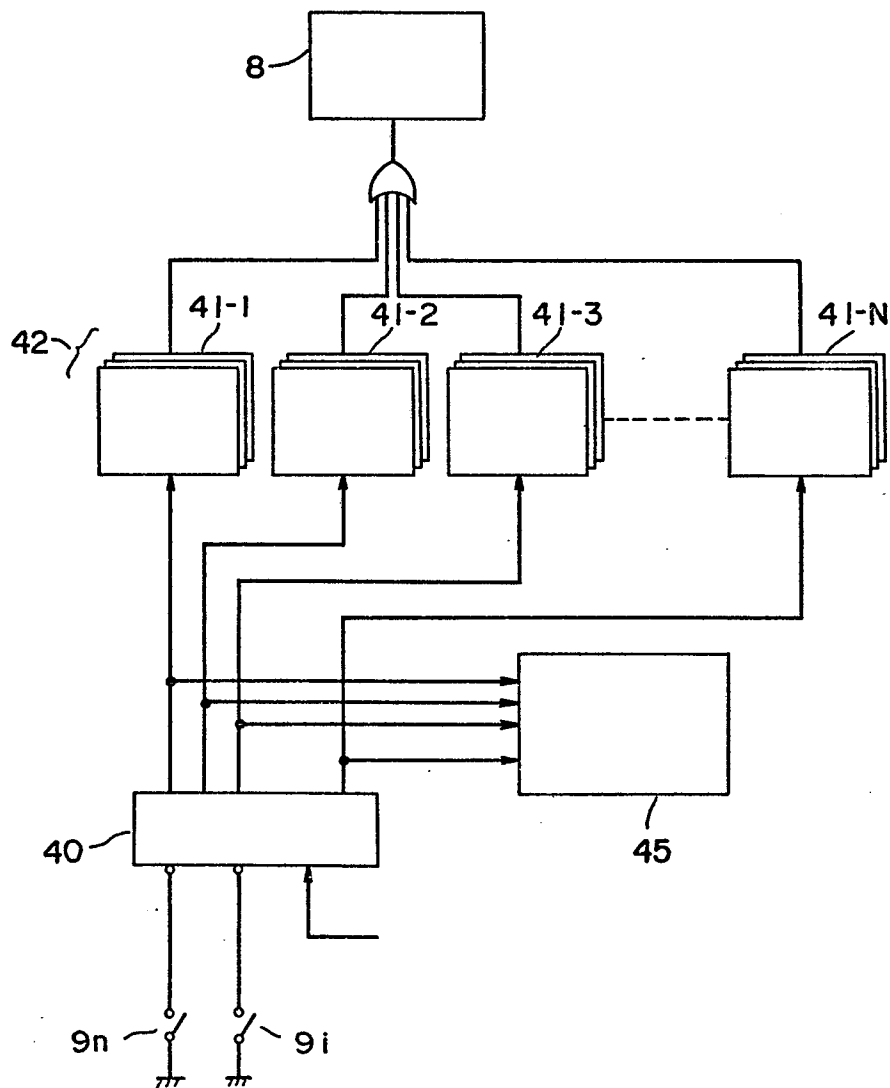


g



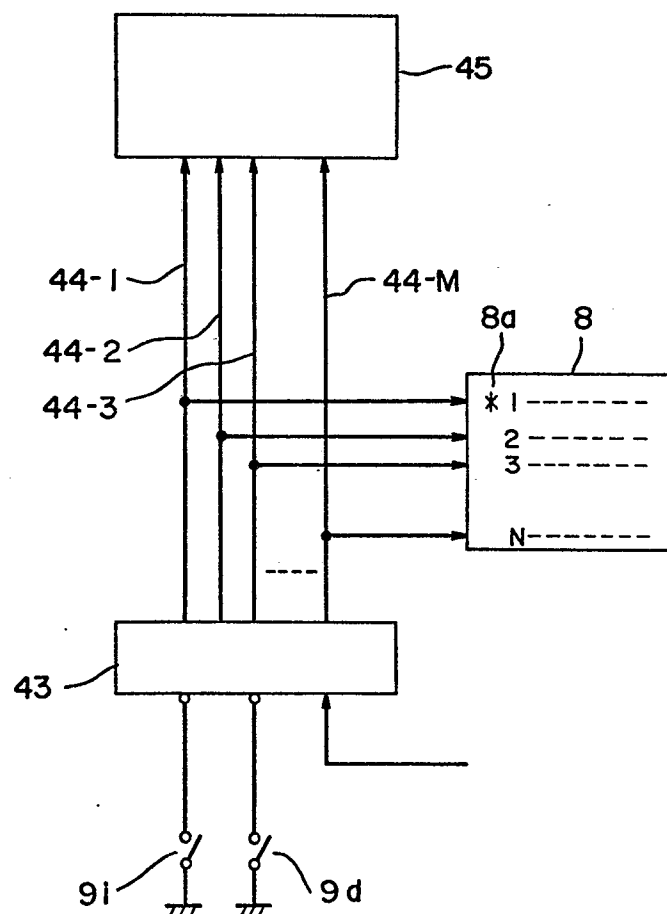
6/11

FIG. 6



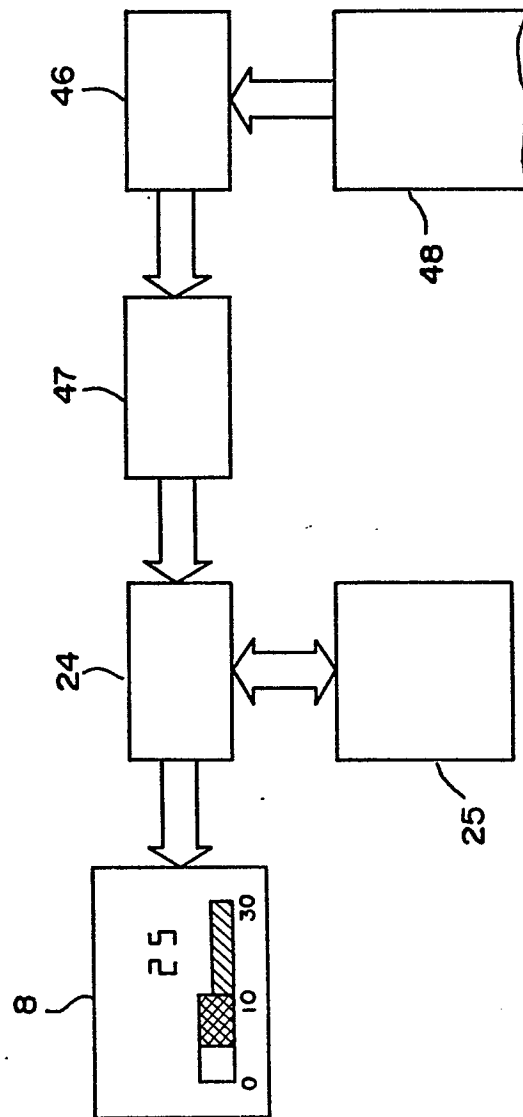
7/11

FIG. 7



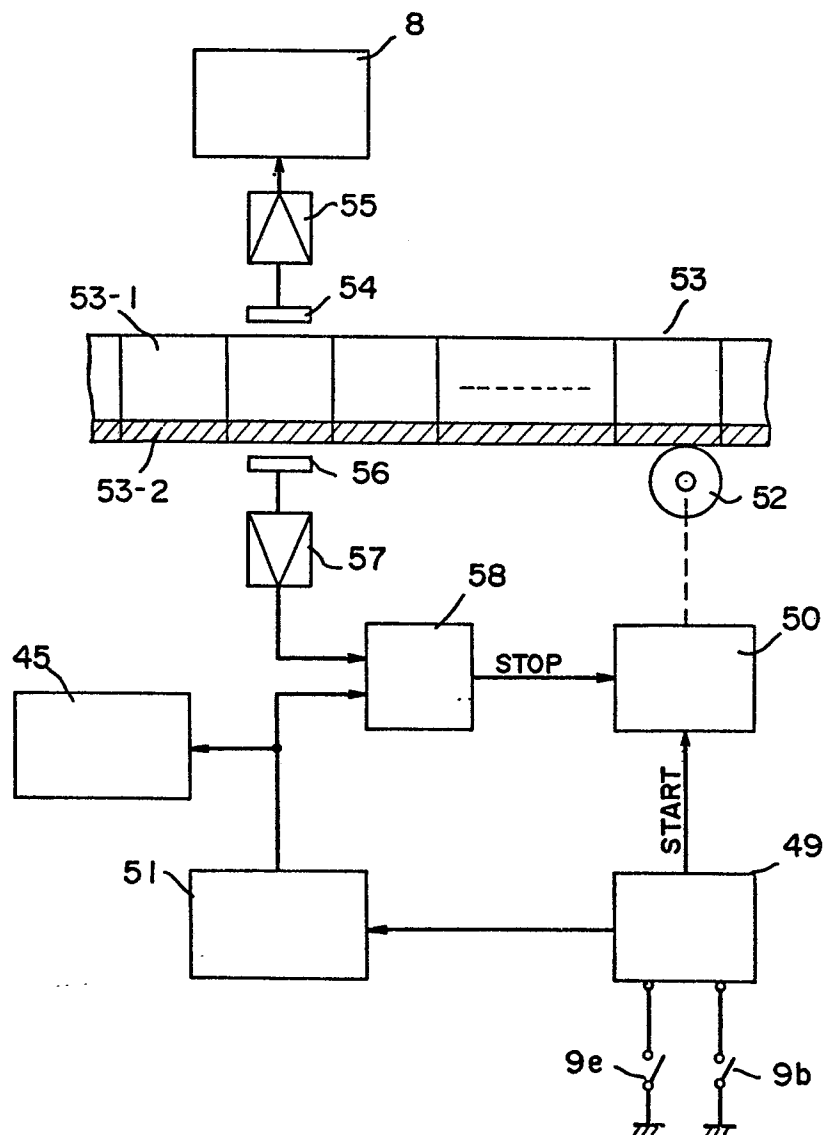
8/11

FIG. 8



9/11

FIG. 9



-10/11

. List of referenced number in the drawings

- 1----- Cooking appliance body
- 2----- Door
- 3----- Operating panel
- 4----- Antenna
- 4a---- Television receiver
- 5 5----- Monitor camera
- 6----- Floppy disk device
- 7----- Video tape recorder
- 8----- CRT
- 9----- Keyboard
- 9a-9i----- Key
- 10----- Speaker sound openings
- 11----- Simple printer
- 10 12----- Voice input device
- 13----- Microprocessor
- 14----- Main memory unit
- 15----- Bus
- 16-----Voice recognition unit
- 17----- Interface
- 18----- Synthesizer
- 19----- Speaker
- 15 20-----Door control unit
- 21----- Interface
- 22----- Magnetron
- 23----- Interface
- 24----- CRT controller
- 25----- Refresh memory
- 26----- Interface
- 20 27----- Interface
- 28----- Switching device
- 29----- Interface
- 30----- Solenoid
- 31----- Lever
- 32----- Pivot
- 33----- Fitting body
- 34----- Hook
- 25 35----- Spring

-11/11

- 36----- Pointer display body
- 37-----Cooking sequence pattern
- 38----- Timer display
- 39-----Time portion
- 40----- Address generating means
- 41----- Picture signal sources
- 5 42----- Data
- 43----- Decode means
- 44----- Decode output lines
- 45----- Function execution means
- 46----- Cooking sequence execution means
- 47----- Pattern generating means
- 48----- Cooking sequence data
- 49----- timing means
- 10 50----- Motor drive means
- 51----- Address counter
- 52----- Motor
- 53----- Video tape
- 54----- Video signal read-out head
- 55----- Amplifier
- 56----- Picture address read-out head
- 15 57----- Amplifier
- 58----- Address comparison means

0075026

INTERNATIONAL SEARCH REPORT

International Application No. PCT/JP82/00095

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl ³ F24C15/00, E05F15/20, G06F3/02, 3/14, 3/16, G09G1/06		
II. FIELDS SEARCHED		
Minimum Documentation Searched *		
Classification System	Classification Symbols	
IPC	F24C1/00, 7/08, 15/00, E05F15/20 G06F3/02 - 3/03, 3/14 - 3/16, G09G1/06	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *		
Jitsuyo Shinan Koho 1966-1982 Kokai Jitsuyo Shinan Koho 1971-1982		
III. DOCUMENTS CONSIDERED TO BE RELEVANT **		
Category *	Citation of Document, *with indication, where appropriate, of the relevant passages **	Relevant to Claim No. **
Y	JP, A, 55-43384 (Matsushita Electric Industry Co., Ltd.) 27.March.1980 (27.03.80)	1 - 15
Y	JP, A, 54-32933 (Stewart-Warner Corp.) 10.March.1979 (10.03.79) Figs.1a, 1b	1 - 15
Y	JP, A, 56-5598 (Sanyo Electric Co., Ltd.) 21.January.1981 (21.01.81)	5
Y	JP, A, 52-108730 (Canon Inc.) 12.September.1977 (12.09.77)	7, 15
Y	JP, A, 53-89323 (Hitachi Ltd.) 5.August.1978 (05.08.78)	8, 9, 10
Y	JP, A, 48-96261 (Toshiba Corporation) 8.December.1973 (08.12.73)	9
Y	JP, A, 50-50817 (The Salartron Electronic Group Ltd.) 7.May.1975 (07.05.75) & US, A, 4,028,695 & FR, A1, 2,237,248 & DE, A1, 2,433,280	11-14
<p>* Special categories of cited documents: **</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"Z" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search *		Date of Mailing of this International Search Report *
June 24, 1982 (24.06.82)		July 5, 1982 (05.07.82)
International Searching Authority *		Signature of Authorized Officer **
Japanese Patent Office		

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

2	JP, A, 57-21026 (Daini Seikosha Co., Ltd.) 3. February. 1982 (03.02.82)	6
---	----------------------------------------------------------------------------	---

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE¹⁰

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers..... because they relate to subject matter¹¹ not required to be searched by this Authority, namely:
2. ☐ Claim numbers..... because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out¹², specifically:

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING¹¹

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.
2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:
3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:
4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

- ☐ The additional search fees were accompanied by applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

