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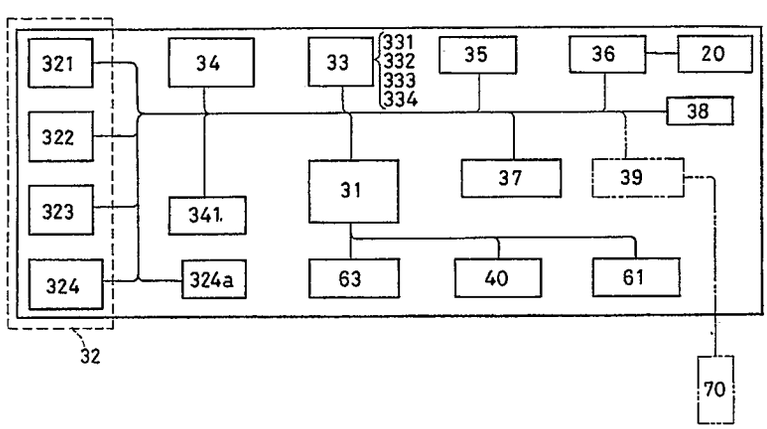
(54) Electronic labeller.

(57) An electronic labeller has an electric circuit for driving a printing unit (40). The electric circuit includes a ROM program part (321), a RAM system part (322), and a RAM printing information store (323). Printing information prepared in a means external from the labeller is stored in a sequencially identifiable manner in the RAM printing information store (323), and may be retrieved for printing purposes by pressing keys (331, 332, 333, 324) so that the printing information is accessed in sequence until the desired information is reached. Audio means activated by speaking a number identifying the information, or a bar code scanner (70) may also be used.

Recording means (324) may be provided to keep a record of the information printed out. The store (323) and recording means (324) may take the form of removable cards.

FIG.3



EP 0 430 609 A1

ELECTRONIC LABELLER

The present invention relates to a manually operated electronic labeller provided with a printing unit which can be driven by an electrical means.

A type of electronic labeller which has been used is adapted so that a printing unit such as a thermographic printing head, etc., and means for carrying a label tape are driven and controlled by an electric circuit having a microprocessor as disclosed in the Patent Publication SHO.58-15376 and the Patent Application Disclosure KOKAI SHO.62-28331. The printing unit is adapted to print required information on a label according to printing information entered in said electric circuit, that is, printing data related to printing characters or information made up by combining said printing data and a printing format related to a printing mode.

This type of conventional electronic labeller is provided with a ten key keyboard for entering the printing information, and users individually prepare printing information with the keyboard and enter it into the electric circuit when they use the electronic labeller.

The conventional electronic labellers have encountered various problems in that, since the printing information has been prepared by means of the ten key keyboard provided on the individual labellers, it has taken a lot of time to prepare the printing information, the operation efficiency has been unsatisfactory, and mistakes have been unavoidable during preparation of printing information. This is particularly so in such businesses as superstores, etc., where a number of labellers are used, since the ratio of occurrence of these mistakes would be high and result in confusion. Furthermore, in superstores, there is the problem that, when commodity prices are to be changed, printing information for individual labellers needs to be prepared and entered after the prices have been changed and the printing information stored in the labellers must be called and revised. Therefore, the number of times that the printing information needs to be prepared by a user will increase, and so there will exist the possibility of the occurrence of a large number of mistakes during this preparation.

Lately, this kind of electronic labeller is often connected to a host computer in which the number of labels issued and the content of information printed are totalized and processed, and this has made evident the problem that faulty preparation of printing information causes errors in computer processing and thus greatly affects sales plans and commodity controls.

The present invention provides a manually operated electronic labeller comprising a casing provided with a handle and a housing, an electric circuit accommodated in the housing, and a printing unit and a tape carrying means which are driven by said electric circuit and are accommodated in the housing, said electric circuit having a memory and a drive control part, said printing unit being adapted to perform printing on labels of a label tape according to printing information selected by said memory, said tape carrying means being adapted to intermittently carry said label tape, and said label tape being adapted so that a label which has been printed is separated from a carrier strip and protruded from a feed-out opening of the housing by returning back the carrier strip for further forwarding, said electronic labeller being characterised in that the memory of said electric circuit has a ROM program part, a RAM system part and a RAM printing information store, said printing information store being adapted to store itemised printing information prepared by an external printing information preparing means, said information being sequencially identifiable and said labeller being provided with means for retrieving printing information stored in said RAM printing information store for printing by said printing unit.

For the electronic labeller in accordance with the present invention, printing information is prepared in advance by external equipment, assigned for example identification numbers in sequence, and then totally stored in the electric circuit of the labeller.

For this purpose, the memory in the electric circuit is provided with the RAM system part and the RAM printing information store, which is used as a part of the RAM system part. Printing information in the printing information store is retrieved by the information retrieving means provided on the casing of the labeller and one desired information item is selected and printed on a label as an actual item of printing information.

An appropriate number of information retrieving keys may be provided as part of the information retrieving means and the stored printing information may be taken out in sequence by these keys and displayed on a display.

An audio identifying means may be used as the information retrieving means and, in this case, the information retrieving part may comprise an audio input unit and an audio identifying unit.

The printing information store may consist of a RAM card. In this case, a number of RAM cards can be used which may be removably mounted on the casing of the labeller.

The memory of the electric circuit may be provided with a part for recording used RAM information which records the printing information

used in printing on labels, as required. The data of the printing information used and recorded in this recording part may be supplied to external equipment such as, for example, a host computer.

The part for recording used information can consist of a recording card. In this case, a number of recording cards can be used which may be removably mounted on the labeller casing.

The electric circuit is preferably provided with a bar code data input part using a scanner such as a pen scanner. The data obtained when the scanner scans bar codes may be entered into this bar code data input part and the same printing information as, or information identified by, the input bar code data may be taken out from the printing information store. In other words, the scanner is used as a kind of information retrieving means.

In addition, the memory of the electric circuit may allow for the preparation of printing information with external bar codes which are scanned and read by said scanner, and/or the storing of this printing information in the printing information store. In this case, since the electric circuit is able to send the bar code data scanned by the scanner to the printing unit as the printing information, the bar codes read by the scanner may be printed on a label and thus the scanner may be used as a copying means.

In the electronic labeller in accordance with the present invention, sequenced printing information is stored in advance in the memory and therefore only the required printing information need be selected by the information retrieving means and used in the actual printing of labels.

For this purpose, the information retrieving means may be provided with retrieving keys by which the printing information stored in the printing information store is retrieved. Also, the retrieval could be effected by, for example, pronouncing identification numbers of the desired printing information.

When the printing information taken out through retrieval is transferred to the RAM system part, the label issuing operation may be started by an operation switch and carried out in the same mode as for conventional electronic labellers.

When the electronic circuit of the electronic labeller has a part for recording used RAM information, details of printing information used to issue labels are recorded in the recording part and therefore information as to the number of labels issued for each article of goods and the time zone for issuing a label for each article can be analysed by supplying the recorded details of the printing information to a host computer.

If the scanner is additionally provided in the electronic labeller according to the present invention as described above, the external bar codes can be scanned and compared with bar code or other printing information which is internally stored in the memory, and/or external bar codes can be stored in the memory.

The present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a labeller in accordance with a first embodiment of the present invention;

Figure 2 is a cutaway side view of the labeller of Figure 1;

Figure 3 is a block diagram of electronic circuitry for use in a labeller in accordance with the described embodiments;

Figure 4 is a perspective view of a second embodiment of the present invention;

Figure 5 is a perspective view of a third embodiment of the present invention; and

Figures 6A and 68 comprise a flow chart showing the operational steps which may be followed by a labeller in accordance with the invention.

Figure 1 is a perspective view showing a first embodiment of the electronic labeller in accordance with the present invention. In this embodiment, the labeller A of the present invention is adapted to receive printing information such as, for example, printing data regarding characters and symbols to be printed, or information as to a combination of printing data and a printing format regarding the printing mode.

Labeller A has a similar configuration to the conventional labeller disclosed in Patent Application Disclosure KOKAI SHO.62-28331 but it differs from the conventional labeller in that the ten key keyboard input means is not provided and the drive control mode by the electric circuit, particularly the microprocessor is specific.

The labeller according to this embodiment has a casing 10 formed by an L-shaped housing 11 and a handle 12 provided across the free ends of this housing 11 as shown in Figure 1. As shown in Figure 2, a power supply battery 20 is stored in the handle 12, while the electric circuit 30, the printing unit 40, for example a thermographic printing head which is driven and controlled by the electric circuit 30, a roll type label tape 50 held by the holder 13 provided on the housing and a label tape carrying means 60 which is driven and controlled by electric circuit 30 to carry this label tape 50 are incorporated in housing 11. The label feedout opening 14 for protruding a printed label is formed in the front of housing 11 and an impression roller 15 is provided as label applying means at this feed-out opening 14.

The bottom of housing 11 is made as an openable cover 16 which can be opened as shown by the broken line. The holder 13 is provided

inside this openable cover 16 and the tape turn-back part 17 for turning back the carrier strip 51 of the label tape 50 is provided at the moving end. This configuration is the same as that of a conventional labeller.

It is preferable to use a thermal printing head such as a thermographic printing head as the printing unit 40 as described above, and this configuration is the same as that of a conventional labeller.

The label tape 50 is made up by temporarily repeelably sticking a number of labels 52 in order on a long carrier strip 51 and entering optical marks (not shown) such as black spots for individual labels on the rear surface of the carrier strip 51. The label tape 50 as described above is the same as is used in conventional labellers.

The tape carrying means 60 has a drive source such as a step motor 61, a feed roller mechanism 62 driven by this step motor 61 and a detecting means 63 such as a photoelectric conversion element which detects the optical marks of the label tape 50 and transmits the detection signal to the electric circuit 30. When this detecting means generates the detecting signal, the electric circuit 30 temporarily stops the step motor 61, and the label 52 on the label tape 50 is stopped at a specified position in relation to the printing unit 40. This construction of the tape carrying means 60 is the same as in a conventional labeller.

The electric circuit 30, as shown in Figure 3, has a drive control part 31, for example, a microcomputer (MPU) and a memory 32. The memory 32 includes the ROM program part 321, RAM system part 322 and RAM printing information store 323 and has a part 324 for recording used RAM information upon request.

The operation of the drive control part 31 is determined by the ROM program part 321 and the RAM system part 322 of the memory 32 and the required printing information is supplied from the printing information store 323 to the RAM system part 322. A lot of printing information may also be totally supplied from an external printing information preparing means such as, for example, a data generating unit B to the printing information store 323, and stored with a series of identifying numbers in the printing information store 323.

The drive control part 31 generates a drive signal for the printing unit 40 and the step motor 61 and determines the generating timing of the drive signal while receiving a detection signal from said detecting means 63.

The electric circuit 30 is provided with a retrieving part 33 which selects the desired printing information stored in the printing information store 323 and transmits it to the RAM system part 322.

In this embodiment, the retrieving part 33 is provided with an advance key 331 for retrieving items of printing information one by one in an advancing direction that is, from a small number to a large number, a rapid advance key 332 for skip-retrieving a specified number of items of printing information, for example, every fifty items of printing information in the advancing direction, a return key 333 for retrieving the printing information one by one in sequence in the return direction and a rapid return key 334 for skip-retrieving a specified number of items of printing information, for example, every fifty items of printing information in the return direction. It is designed so that, as a first step, an identifying number close to that of the required printing information is retrieved by the rapid advance key 332 or the rapid return key 334 and, as a second step, the identifying number of the required printing information is retrieved by the advance key 331 or the return key 333.

If it is designed as above, the required printing information can be quickly retrieved as described below. For example, assuming that 1,000 items of printing information with identifying numbers from 000 to 999 are stored in the printing information store 323. For the purpose of using the 555th item of printing information, the 550th item of printing information can be firstly retrieved by operating the rapid advance key 332 or the rapid return key 334, then the retrieval can be completed by using the advance key 331 to advance by a further five identifying numbers. Thus, the 555th item of printing information can be quickly taken out from 1,000 items of printing information.

The electric circuit 30 is further provided with a display 34, an operating switch 35 such as a trigger switch for issuing labels, a power supply switch 36, an interface 37 for transmitting and receiving the printing information and a connector 38 and may, in some cases, be provided with a scanner bar code data input part 39, as described in the second embodiment of the present invention.

The display 34 indicates the contents of the printing information selected by the retrieving part 33. In the embodiments, it is formed with a liquid crystal display 34 provided with a backup battery 341 and information displayed on this display 34 is printed on a label.

The operating switch 35 actuates the electric circuit 30, particularly the drive control part 31, when it is pressed, thereby enabling the label tape 50 to be forwarded and the label 52 to be printed upon.

The operating switch 35 can be used for other applications other than for issuing labels, and these applications can be set by the ROM program part 321.

The power supply switch 36 is connected to the power supply battery 20 to switch on or off the electric circuit 30 and the power supply 20 when it

is operated.

The interface 37 is provided mainly to transmit or receive the printing information to be stored and the used printing information, between external equipment, such as a host computer or the data generating unit B, and the memory 32, through a connector 38. The electronic labeller in accordance with the present invention can be provided with a scanner such as a pen scanner 70, as in the case of the second embodiment shown in Figure 4, to scan bar codes and supply bar code data as printing information to the memory 32 through the pen scanner bar code data input part 39.

In this case, a selecting operation for retrieving printing information corresponding to or identified by bar codes read by the pen scanner 70 and for taking it out from the memory 32, or a copying operation for preparing bar code data as printing information from bar codes read by the pen scanner 70 and writing it into the memory 32 can be obtained. The selecting operation allows for the taking out of bar code data corresponding to, or identified by, the bar codes read by the pen scanner 70 from the printing information store 323 and for printing the bar code data on labels 52, while the copying operation allows printing on the label 52 of the same bar codes as the bar codes read by the pen scanner

The printing information store 323 may consist of a card which is removably mounted on the casing 10 as shown in Figure 5, since it is satisfactory that printing information externally prepared in advance can be totally stored. In this case, the printing information can be prepared by, for example, a host computer C and recorded in a RAM card 323′ by using the card reader/writer R and this card 323′ can be inserted, as the printing information store 323, in the electric circuit 30.

For this purpose, the housing 11 of casing 10 in this embodiment is provided with a card socket 18 into which the RAM card 323′ is removably mounted.

The part 324 for recording used RAM information records the use of printing information and is preferably provided with, for example, a time control part 324a as shown in Figure 3 so that the time can be controlled by a time measuring function. If this function is provided, which printing information is used and how many times it is used can be recorded in the recording part 324 of used RAM information with the lapse of time and therefore how many labels have been issued for what kind of goods within a specified time zone can be recorded. Accordingly, the information of this recording part 324 of used RAM information can be used for commodity control, inventory control, sales plans, etc., by supplying the information to the host computer C through the interface 37 for analysis to obtain the data on commodities.

The recording part 324 of used RAM information can be made as a card as in the case of the printing information store 323. If this card type RAM recording card 324′ is adapted to be removably mounted in the card socket 19 of the housing 11, the recording card 324′ as the recording part 324 of used RAM information can be processed by the card reader/writer R and the used printing information can be supplied to the host computer C.

Hereupon, the printing information can be prepared in the host computer C and can directly be supplied to the printing information store 323 of the electric circuit 30 and the contents of the records in the recording part 324 of used RAM information can be directly transmitted to the host computer C. In addition, the printing information can be retrieved by voice in addition to the key buttons and the pen scanner. In this case, it is necessary to provide a voice receiving part in the housing 11 and a voice identifying means having an audio input unit and an audio identifying unit as a retrieving part 33 of the electric circuit 30.

The following describes the operations of the labeller in accordance with the present invention with reference to the flowchart shown in Figures 6A and 6B.

When the power supply switch 36 is closed and the power is supplied to the electric circuit 30, the printing information currently selected is displayed on the display 34.

This printing information is printed on the label 52 by driving the operating switch 35, and the label 52 is peeled from the carrier strip 51 as the carrier strip 51 moves, is protruded from the feed-out opening 14 and depressed onto an article by the depressing roller 15. Thus, this label issuing operation is carried out independently for a single label or continuously for a number of labels each time the operating switch 35 is driven. At this time, the printing information printed on the label 52 and the number of issued labels are recorded in the recording part 324 of used RAM information and transmitted to the host computer C as described above.

When changing the printing information to the label 52, the retrieving part 33 is driven without driving the operating switch 35 and the desired printing information is retrieved and selected from a number of items of printing information stored in the printing information store 323.

This retrieval is carried out by carrying out high speed retrieval with the rapid advance key 332 or the rapid return key 334 and subsequently carrying out low speed retrieval with the advance key 331 or the return key 333.

The printing information thus retrieved and selected is displayed on the display 34 and printed

on the label 52 when the operating switch 35 is driven as described above and the label 52 is protruded from the feed-out opening 14 of the housing 11.

Transmission and reception between the electronic labeller of the present invention and external equipment may be carried out by the keys of the retrieving part

In this case, keys 331, 332, 333 and 334 are used as the mode selection keys and are operated before the power supply switch 36 is closed.

In one method, the rapid return key 334 is used to select a scanner retrieval mode, which can be selected by pressing the power supply switch 36 while the key 334 is kept pressed.

When this mode is selected, the electric circuit 30 serves to retrieve printing information corresponding to or identified by bar code printing information scanned by the pen scanner 70 in the printing information store 323, to display it on the display 34 if it is present in the printing information store 323, to select it as actually to be used printing information, to print the bar codes of this printing information on the label when the operating switch 35 is driven and to carry out the label issuing operation as described above.

The return key 333 is used to select the scanner copying mode, which is selected by pressing the power supply switch 36 while the key 333 is kept pressed.

When this mode is selected, the electric circuit 30 serves to store the bar codes scanned by the pen scanner as the printing information to be actually used in the RAM system part 322, to display it on the display 34, and to print it on the label 52 when the operating switch 35 is driven, thus carrying out the label issuing operation.

The rapid advance key 332 is used to select the printing information reception mode, which is selected when the power supply switch 36 is pressed while the rapid advance key 332 is kept pressed. When this mode is selected, printing information is transmitted from the external equipment such as the host computer C or the data generating unit B to the printing information store 323 of the memory 32 and stored for example in order of identifying numbers.

Meantime, the advance key 331 is used to select the transmission mode of used printing information. When this mode is selected, the electric circuit 30 transmits information relating to the issuance of labels stored in the recording part 324 of used RAM information to the external equipment such as the host computer C, etc.

Accordingly, if the printing information store 323 and the recording part 324 of used RAM information are made in the form of cards, mode selecting operations by the rapid advance key 332 and advance key 331 can be omitted.

In addition, the operating switch 35 is used to select a mode for printing out the records regarding the issued labels. This mode is selected by pressing the power supply switch 36 while the operating switch 35 is kept pressed. When this mode is selected, a label, on which the contents of the record as to the issued label is printed, is issued when the power supply switch 36 is closed. For this label issuing operation, a sheet of labels is usually used as the printing medium and the number of labels on which the printing information currently displayed on the display 34 have been printed is printed on this label.

The electronic labeller in accordance with the present invention retrieves and selects as required desired printing information from a number of sequential items of printing information which are prepared in advance by external equipment and stored in the memory 32. Therefore the electronic labeller provides the effect that the label issuing operation is far quicker than for a conventional electronic labeller for which the printing information is individually prepared and entered by the user. It avoids mistakes in the preparation of the printing information, allows a number of items of printing information to be prepared by a single external equipment for common use by many electronic labellers, and therefore allows accurately prepared printing information to be transferred to a number of labellers for effective use.

In the case of the electronic labeller according to the third embodiment in which the printing information store 323 of the memory 32 consists of the RAM card 323′, it is advantageous in that an extremely large amount of printing information can be used in the field since an operator is able to carry a number of RAM cards, and therefore label issuing operations for many kinds of goods can be easily carried out merely by changing the RAM card 323′, even in such fields as superstores and warehouses where many kinds of goods are usually handled.

In the case of the electronic labeller according to the present invention in which the retrieving part 33 is made as voice identifying means, it provides the benefit that the contents of printing information for labels can be changed while both hands of the operator are used for other work since the printing information can be replaced by a voice during label issuing operation.

In addition, in the case of the electronic labeller according to the present invention which has the used information store 324, it provides the benefit that the information regarding the issued labels can be supplied to the host computer for analysis. The information of a plurality of recording cards 324′ can be totally processed by the host computer if

the recording part 324 of used RAM information is made as the recording card 324' and therefore label issuing operation can be continued merely by replacing the recording card 324' during label issuing operation, and accordingly the inconvenience of interrupting the label issuing operation for transferring the printing information to the host computer can be eliminated.

In the case of the electronic labeller according to the second embodiment which has the pen scanner 70, it provides the benefit that retrieving operation of the printing information and the label issuing operation can be extremely easy since the existing bar codes on the labels stuck to goods can be read and the same printing information as, or information identified by, these bar codes can be selected from the printing information store 323, or the same bar code pattern can be prepared with the bar code signals detected through scanning by the pen scanner 70.

Claims

1. A manually operated electronic labeller comprising a casing provided with a handle and a housing, an electric circuit accommodated in the housing, and a printing unit and a tape carrying means which are driven by said electric circuit and are accommodated in the housing, said electric circuit having a memory and a drive control part, said printing unit being adapted to perform printing on labels of a label tape according to printing information selected by said memory, said tape carrying means being adapted to intermittently carry said label tape, and said label tape being adapted so that a label which has been printed is separated from a carrier strip and protruded from a feed-out opening of the housing by returning back the carrier strip for further forwarding, said electronic labeller being characterised in that the memory of said electric circuit has a ROM program part, a RAM system part and a RAM printing information store, said printing information store being adapted to store itemised printing information prepared by an external printing information preparing means, said information being sequencially identifiable and said labeller being provided with means for retrieving printing information stored in said RAM printing information store for printing by said printing unit.

2. An electronic labeller in accordance with claim 1, wherein said information retrieving means comprises an advance key for retrieving printing information stored in the RAM printing information store item by item in sequence in a forward direction, and a return key for retrieving said information item by item in sequence in a backward direction.

3. An electronic labeller according to claim 2, wherein said retrieving means further comprises a rapid advance key for skipping a specified number of items of printing information in the forward direction to retrieve the desired printing information and a rapid return key for skipping a specified number of items of printing information in the backward direction to retrieve the desired printing information.

4. An electronic labeller according to claim 2 or 3, wherein the labeller is provided with a power supply switch and an operating switch and the labeller can be put into different operating modes by depressing various ones of said retrieval keys and said switches in an appropriate sequence.

5. An electronic labeller in accordance with any preceding claim, wherein said information retrieving means is adapted to carry out an information retrieving operation according to an audio signal.

6. An electronic labeller in accordance with any preceding claim, wherein said RAM printing information store consists of a RAM' card on which printing information is written, said RAM card being removably mounted on a card socket provided on the casing.

7. An electronic labeller in accordance with any preceding claim, wherein said memory of the electric circuit includes a part for recording used RAM information for recording the contents of printing information used in said printing unit so that the information of this recording part of used RAM information can be supplied to external equipment.

8. An electronic labeller in accordance with claim 7, wherein said part for recording used RAM information consists of a RAM recording card which is removably mounted in the card socket provided on the casing.

9. An electronic labeller in accordance with any preceding claim, wherein said electric circuit is provided with a scanner bar code data input part to which a scanner is connected to scan external bar codes.

10. An electronic labeller in accordance with claim 9, wherein said electric circuit is adapted to retrieve printing information from said RAM printing information store corresponding to or identified by the bar code data scanned by said scanner.

11. An electronic labeller in accordance with claim 10, wherein said retrieved printing information is the same bar code data as the bar code data scanned.

12. An electronic labeller in accordance with any of claims 9 to 11, wherein said electric circuit is adapted to drive the printing unit to print the same bar codes as the bar codes scanned by said scanner according to the bar code data obtained from scanning by said scanner.

13. An electronic labeller in accordance with claim 12, wherein said scanned bar code data is entered

into the printing information store.

FIG.1

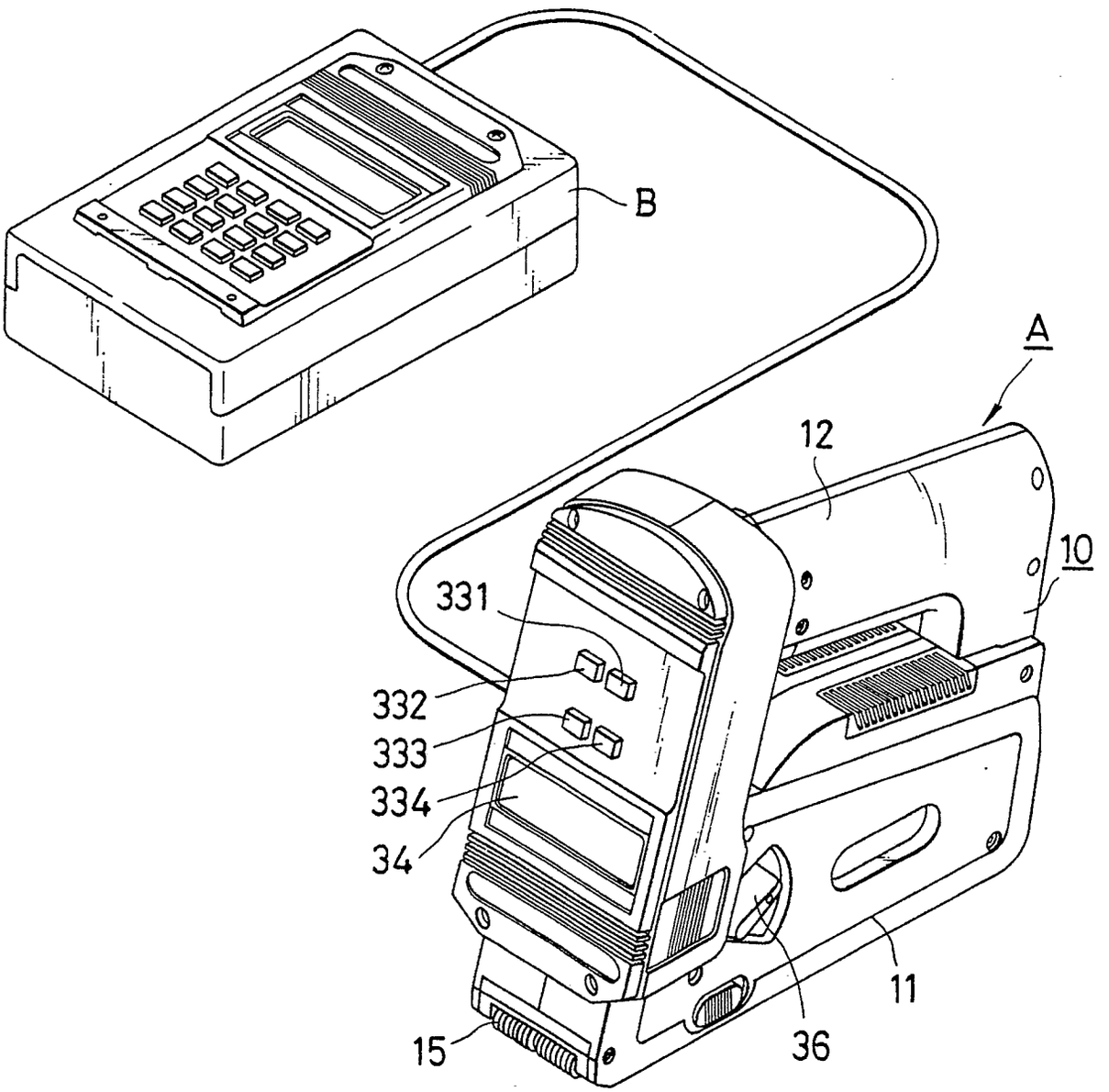
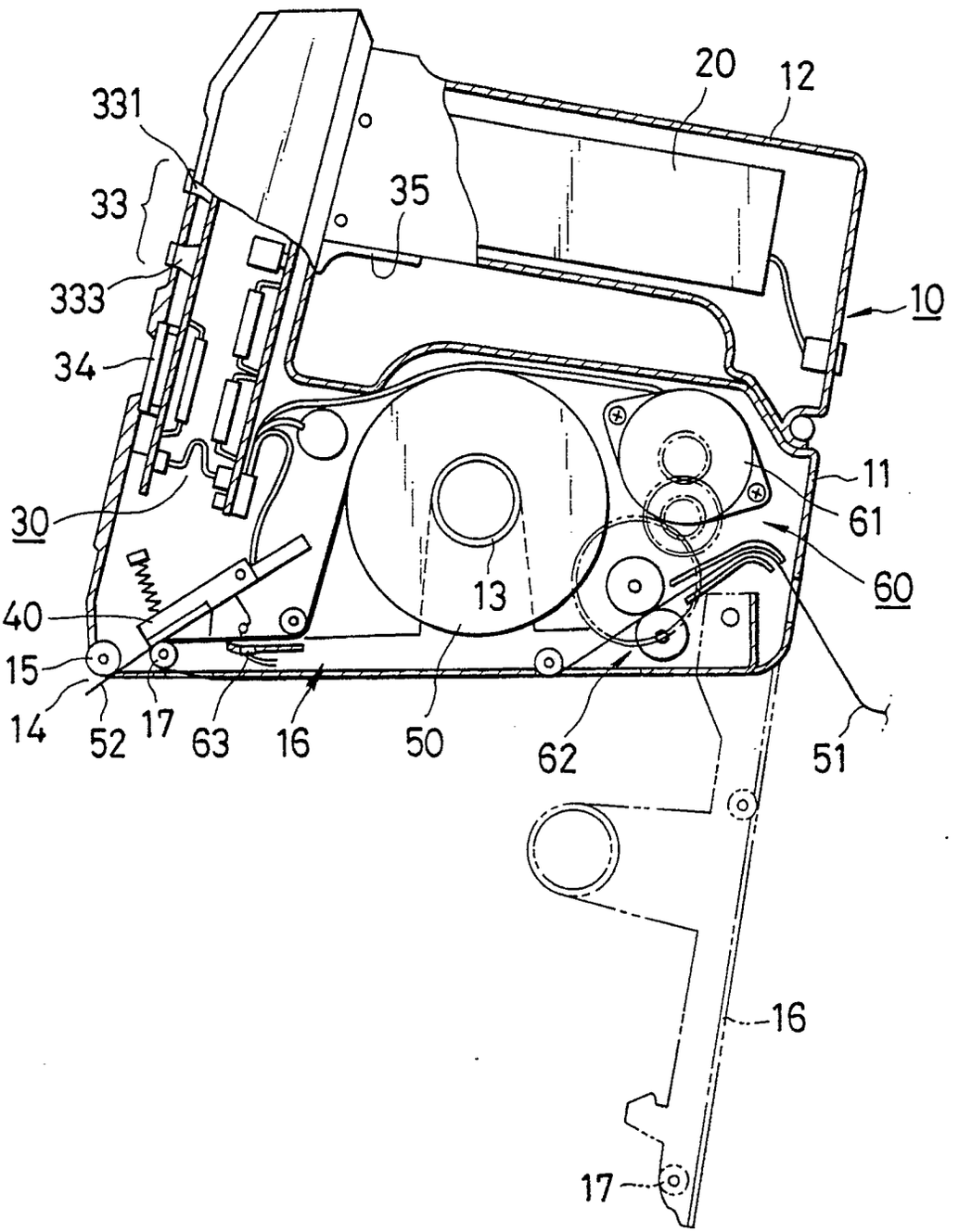


FIG.2


331
33
333
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30
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52
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13
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11
61
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16
17

FIG.3

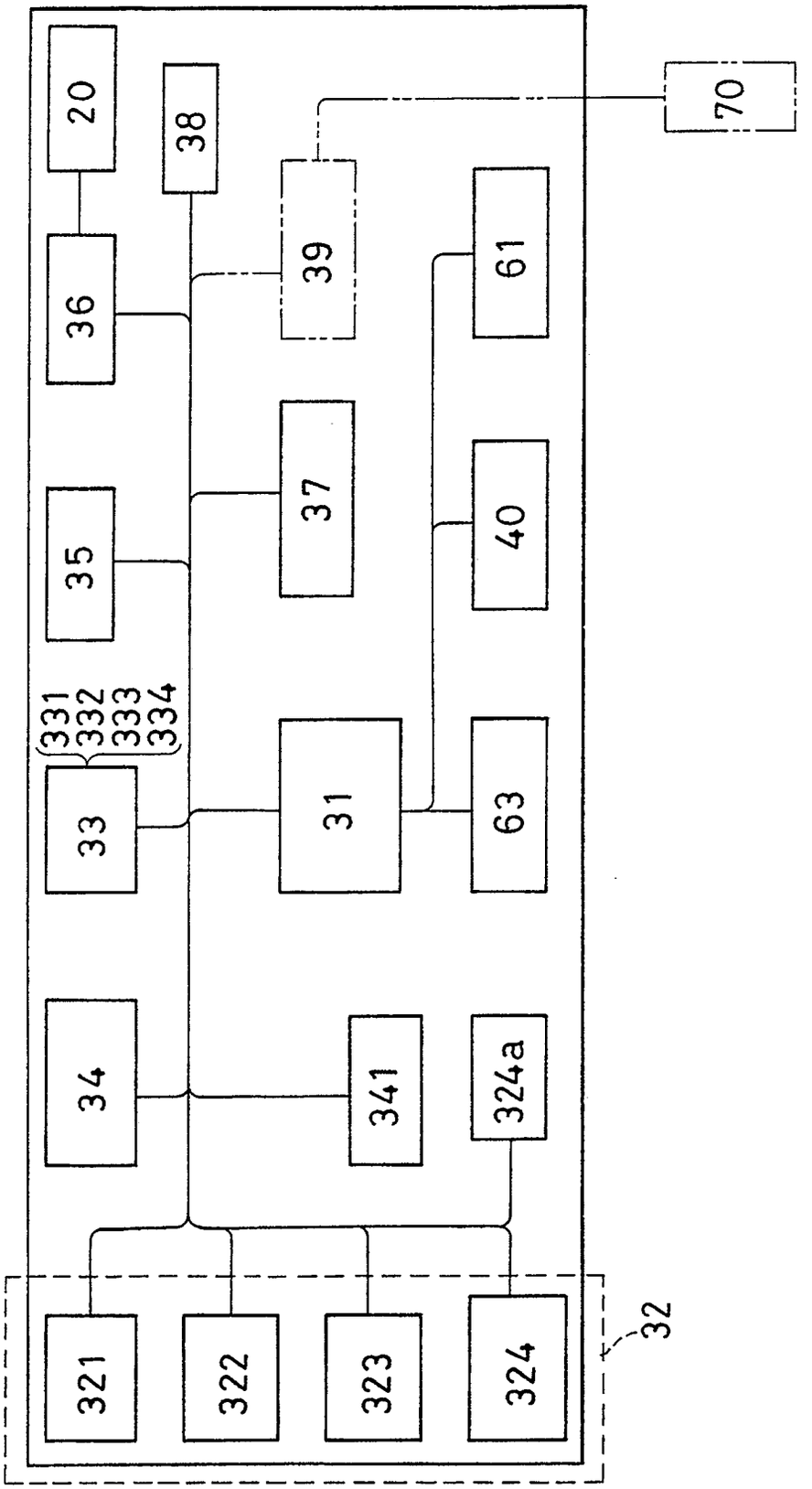

20
38
70
36
39
61
37
35
40
331
332
333
334
33
31
63
34
341
324a
321
322
323
324
32

FIG.4

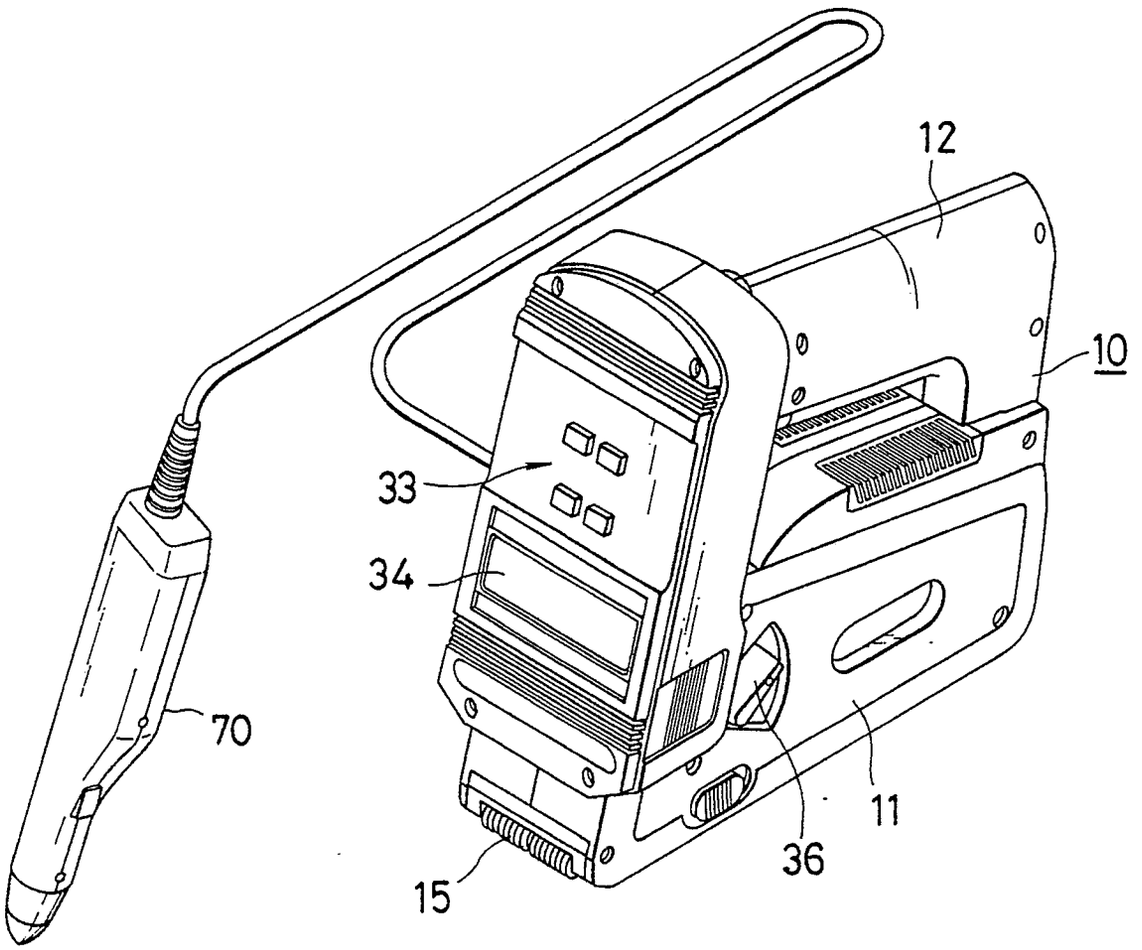


FIG.5

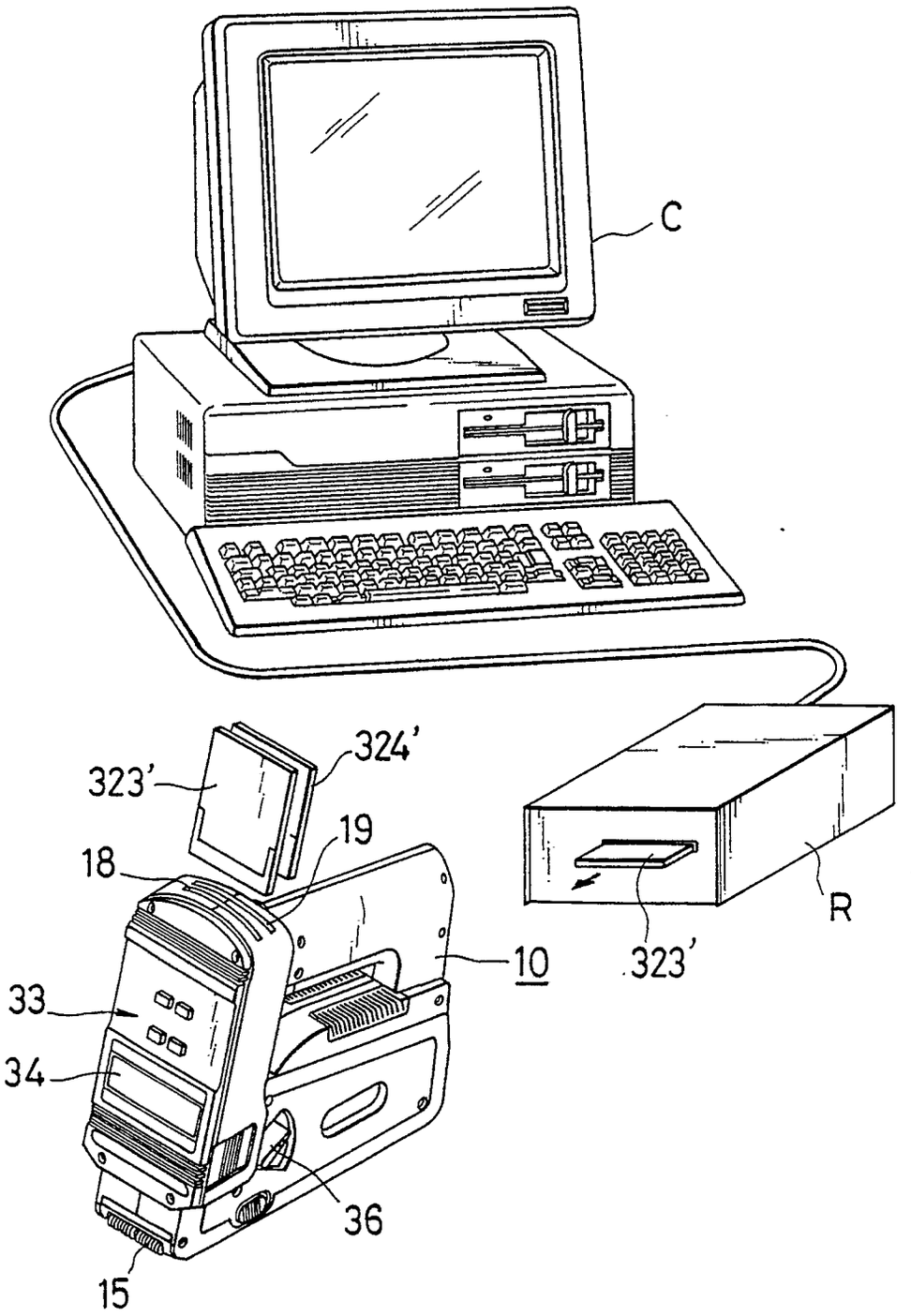


FIG.6

FIG.6A	FIG.6B

FIG.6A

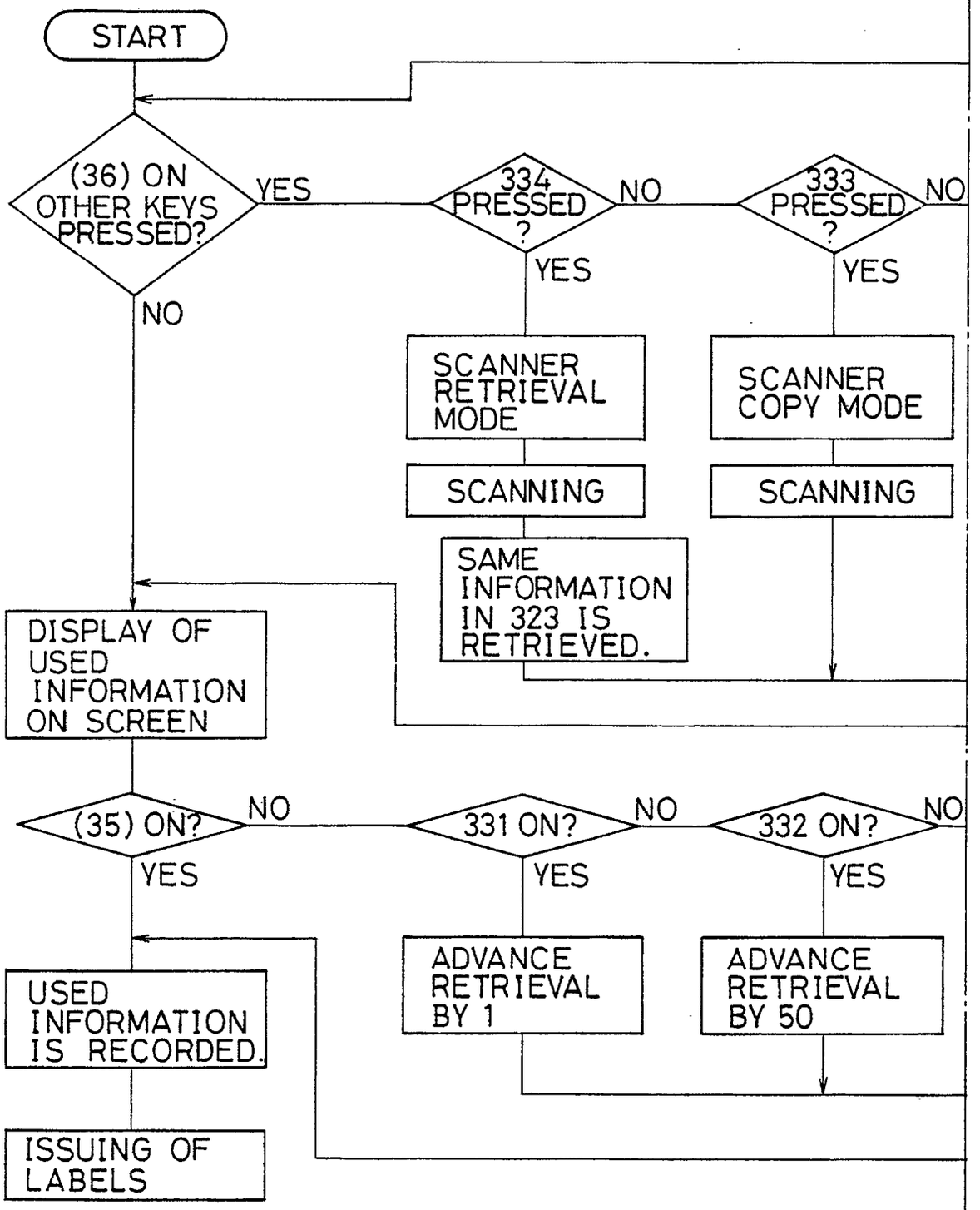
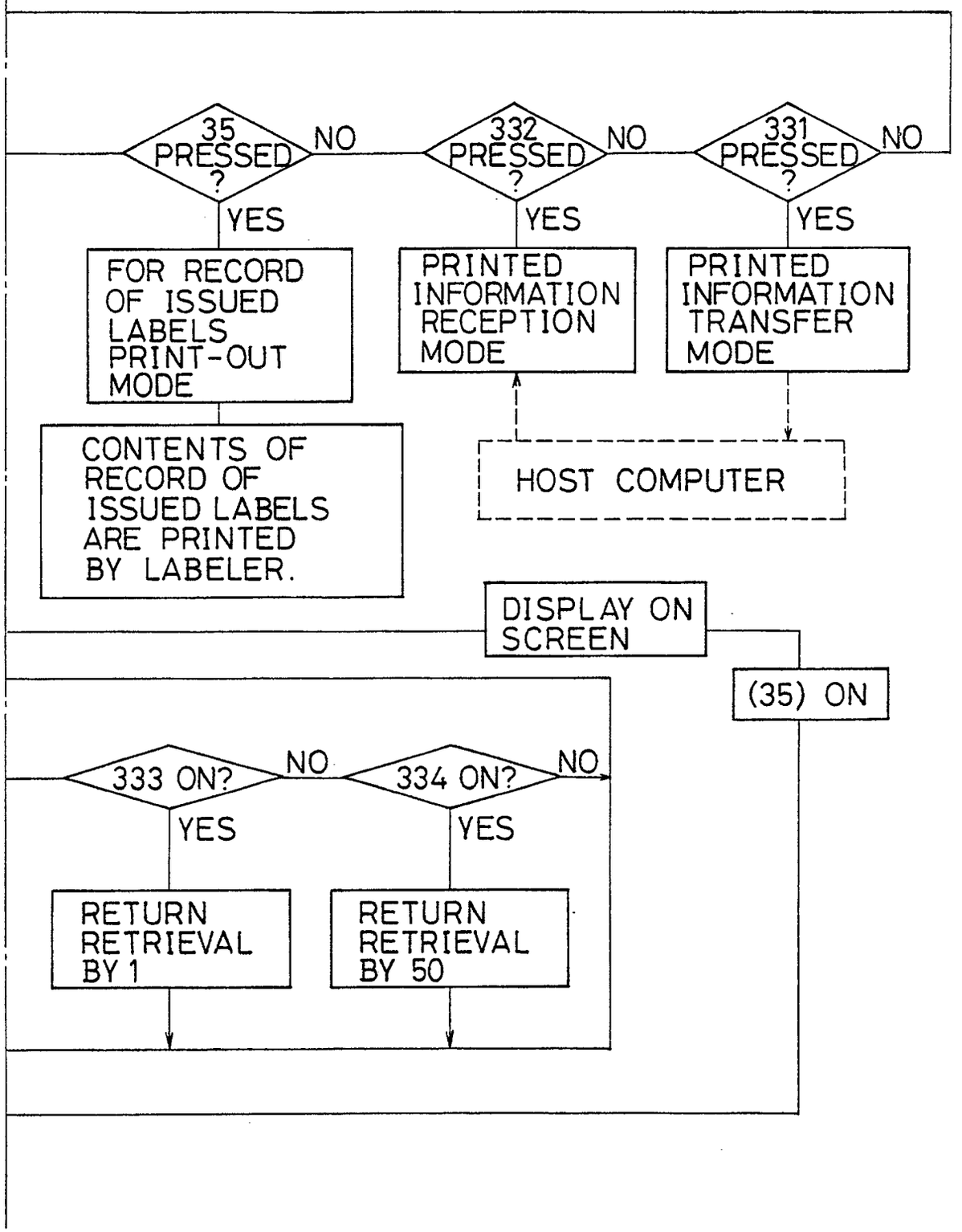


FIG.6B


35 PRESSED ?
NO
YES
332 PRESSED ?
NO
YES
331 PRESSED ?
NO
YES
FOR RECORD OF ISSUED LABELS PRINT-OUT MODE
PRINTED INFORMATION RECEPTION MODE
PRINTED INFORMATION TRANSFER MODE
CONTENTS OF RECORD OF ISSUED LABELS ARE PRINTED BY LABELER.
HOST COMPUTER
DISPLAY ON SCREEN
(35) ON
333 ON?
NO
YES
334 ON?
NO
YES
RETURN RETRIEVAL BY 1
RETURN RETRIEVAL BY 50

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90 31 2812

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.5)
X	EP-A-0 208 203 (SATO K.K.) * Figures 1,2; page 4, line 2 - page 5, line 24 *	1,9-13	B 65 C 11/02
X	EP-A-0 199 252 (SATO K.K.) * Page 6, line 20 - page 7, line 17; page 8, line 26 - page 9, line 13; figures 1,2,4,5 *	1,7,9-13	
A	US-A-4 871 269 (MURATA)		
D,A	US-A-4 826 558 (WADA et al.) & JP-A-58 015 376		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
B 65 C G 06 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	07 February 91	DEUTSCH J.P.M.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
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