(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 600 848 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **94100165.3**

(22) Date of filing: **28.05.86**

(51) Int. Cl.5: **B65H 1/08**, G06F 15/30, G06K 7/04

This application was filed on 07 - 01 - 1994 as a divisional application to the application mentioned under INID code 60.

(30) Priority: **27.06.85 US 749960**

(43) Date of publication of application:
08.06.94 Bulletin 94/23

(60) Publication number of the earlier application in accordance with Art.76 EPC: **0 459 529**

(84) Designated Contracting States:
BE CH DE FR GB IT LI NL SE

(71) Applicant: **DIEBOLD, INCORPORATED**
Post Office Box 8230
Canton, OH 84711(US)

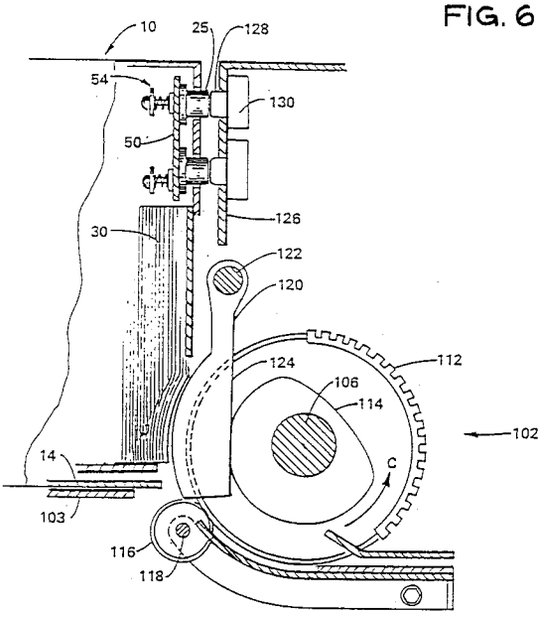
(72) Inventor: **Graef, Harry T.**
241 South Central Avenue
Bolivar, OH 44612-0287(US)
Inventor: **Newton, Kevin H.**
3519 Waterford Avenue N.W.
Canton, OH 44708(US)
Inventor: **Allison, Timothy B.**
610 Jeffrey Avenue N.W.
Massillon, OH 44646(US)
Inventor: **Eastman, Jeffrey M.**
7330 Carmen Drive
North Canton, OH 44720(US)

(74) Representative: **Saconney, Piero et al**
c/o JACOBACCI-CASETTA & PERANI S.p.A.
Via Alfieri, 17
I-10121 Torino (IT)

(54) Document dispensing apparatus.

(57) An apparatus for dispensing documents includes at least one removable container (10) for holding a supply of documents (30) and a machine associated with said container. Said apparatus comprises: a housing (101) of said machine, said container (10) mounted on said housing during operating of the apparatus; a picker mechanism mounted on said housing in operative connection with said container for removing documents from the supply for dispense; a plurality of information indicating means (25) associated with said container; a plurality of sensing means associated with said machine; and control means (130) in operative connection with said sensing means controlling the picker mechanism, the said indicating means (25) being selectable between a first condition and a second condition. An arrangement of said conditions represents a characteristic of said documents, and is changeable to produce different arrangements representing different characteristics of said documents. The said control means (130) adjust how the picker mechanism (100) operates in accordance with the characteristic represented by the selected arrangement of the indicating means.

FIG. 6



EP 0 600 848 A2

Technical Field

This invention relates to document dispensing machines such as Automated Teller Machines (ATMs). Specifically this invention relates to an improved apparatus for dispensing documents, including at least one removable container for holding a supply of documents and a machine associated with said container, according to the preamble of claim 1.

Background Art

Automated document dispensing machines such as ATMs contain supplies of documents to be dispensed. Usually such machines dispense several types of documents. These documents may include different denominations of paper currency or travellers checks. It is the general practice to load a store of documents into an ATM in specialized containers called "canisters". Canisters are usually filled with documents at locations away from the ATM under secure conditions. Normally each canister will contain only one type of document. Canisters generally contain locking mechanisms which secure the canisters once they are filled with documents. Canisters are transported to the ATM in the locked condition. Special unlocking mechanisms inside the ATM unlock the canister as they are loaded into the machine.

Canisters are designed to operate in conjunction with the particular document removal mechanism incorporated into the ATM. The canister is an integral part of the document dispensing system. An example of a canister adapted for use in an ATM is disclosed in U.S. Patent No. 4,113,140.

Canisters present the advantage of allowing large numbers of documents to be loaded into ATMs quickly and also permit interchangeability of canisters between machines which have the same type of document removal mechanism. All paper currency in the United States has the same physical dimensions and consistency regardless of denomination. Therefore, canisters which are used to dispense paper currency are interchangeable with regard to the denomination of the currency which may be dispensed therefrom.

While the interchangeability of document canisters between ATMs and the ability to place different types of paper currency in the same canister are desirable features, problems have developed. First, most ATMs are designed to dispense a plurality of denominations of bills and therefore must contain a plurality of canisters, one for each denomination of bills. Most ATMs are designed so that each bill type must be provided at a particular location inside the ATM to achieve a proper dispense. Failure to load the various bill canisters into the proper canister locations will result in malfunctions; for example, the ATM dispensing ten dollar bills when twenty dollar bills are requested.

Financial institutions and other operators of ATMs have sought to avoid these problems by physically labeling each canister with information on the document type contained therein and by labeling the corresponding positions for the canisters inside the ATM. Taking these precautions generally insures that the person loading the canisters will do so properly; however, errors still occur. Further, it is difficult to remove such permanent labeling from a canister when it is desired to use the canister to dispense a different type of document.

As canisters are an integral portion of the document delivery system, defects in a canister may cause dispense failures. Such failures sometimes occur infrequently at irregular intervals making the cause of the problem difficult to pinpoint. Some operators of ATMs have assigned serial numbers to their canisters to monitor whether certain of them are involved in an extraordinary number of dispense failures, which may indicate a defective condition. As serial numbers are generally printed on the canisters in a human readable form, tracking the identity of canisters involved in failures requires considerable bookkeeping and paperwork. Such manual record keeping is often subject to human error. In addition because dispense failures are generally readily corrected, all failures may not be reported. These problems make keeping track of the canisters involved in failures burdensome and available records are often inaccurate.

Additional problems may arise when several entities such as a group of banks elect to operate a network of many ATMs, which are located away from the banks such as in grocery stores, shopping malls, and airports. In such a network several of the financial institutions may wish to share responsibility for servicing the ATMs, including providing the canisters filled with documents and currency. In these situations there is need to know the origin of the currency or documents dispensed from each ATM to settle accounts between the participants. For example, if a customer of a first bank receives money at an ATM located in a shopping mall and the currency in that ATM belonged to a second bank, it is necessary to keep track of the parties involved in the transaction so that the first bank can repay the second bank for the money received by its customer. Tracking accounts is less complex if the second bank always provides the currency dispensed from a particular ATM and the identity of the ATM where each transaction occurs is maintained in the records of the network. The situation becomes increasingly complicated however when several entities share responsibility for loading cur-

rency into the same ATM; for example, each providing the currency on alternative weeks. This greatly complicates the record keeping necessary to settle accounts between the various parties involved. Such record keeping is prone to inaccuracy because it is difficult to keep track of the origin of the currency or documents involved in particular transactions. As more entities share responsibility for loading documents into ATMs, the problems of record keeping grow proportionately.

Others have previously attempted to overcome some of the foregoing problems by labeling document canisters in a manner which can be received by the computer system which controls the operation of an ATM. Such information may be stored or utilized in combination with other data to accomplish such things as, for example, to prevent operation of the ATM when the canisters have been misloaded and to track the particular serial numbers assigned to such canisters.

There is frequently a need for ATMs to dispense documents other than currency. Usually these documents are dispensed using the same dispense mechanisms which were originally designed to handle only paper currency. Such documents may include, for example, travellers checks, coupons, and gift certificates. Such documents will generally have physical characteristics that differ somewhat from paper currency. Often however these documents may be effectively dispensed provided that the operation of the dispense mechanism is slightly modified. In many cases such modifications can be automatically implemented provided that the computer which controls the operation of the dispensing mechanism has available a sub-routine which will operate to control the ATM's dispense mechanism in accordance with the characteristics of the documents. The parameters which may need to be modified may include, for example, the speed at which the dispense mechanism operates or the cycle times of certain components of the dispense mechanism. If a means is available to distinguish these other documents from currency in the canister, these changes in the operation cycle of the dispensing mechanism can be implemented by the computer automatically. In addition, paper currency itself may have different characteristics depending on whether it is new or used. It is therefore desirable to vary the operating parameters of the dispensing mechanism to better suit the character of the currency in a canister. To applicant's knowledge no prior system has been developed that is capable of presenting such information on a document canister in a form that can be received and utilized by the computer which operates an ATM.

As a result of the limitations which exist in prior systems, there exists a need for an inexpensive and reliable apparatus for providing, identifying, and indicating information concerning the contents of a document canister, more particularly information relating to the different types of dispensed documents, which information can be read, transmitted, and utilized by a computer controlling the operation of an ATM or other document dispensing mechanism and which information is secure from tampering but may be readily changed by authorized personnel.

Disclosure of Invention

It is an object of the present invention to provide an apparatus for dispensing documents, of the type indicated in the preamble of claim 1, and which is inexpensive and reliable.

According to the invention this object is attained by an apparatus as claimed.

The present invention achieves the foregoing objects by providing apparatus in which information is labeled on a document canister for an ATM, which information is provided in a form which is read by apparatus located inside the ATM. The information is communicated to the computer controlling the operation of the ATM which then operates to change the operation of the dispensing mechanisms of the ATM to conform such operation to the type of documents contained in the canister. The information provided according to the present invention is used to track the ownership of the canister and the documents contained in the canister, which information is used to simplify the settlement of accounts between a plurality of parties who load their document canisters into an ATM.

Advantageously, the apparatus according to the invention incorporates a system for identifying and indicating the content of document canisters according to European Patent Application No. 90112217, of which the present application is a division.

Brief Description of Drawings

Figure 1 is a perspective view of a canister containing currency, which is incorporated in the preferred embodiment of the present invention.

Figure 2 is a perspective view of the document canister with its top raised.

Figure 3 is a plan view of the mechanism which removes documents from the canister inside an ATM and the switch actuators which correspond the buttonhole locations on the canister.

Figure 4 is a partially sectioned perspective view of the posterior portion of the canister.

Figure 5 is a partially sectioned top view of the canister and the switch actuators on the ATM

which correspond to the buttonhole locations.

Figure 6 is a section view of the canister and the document removal mechanism in operating position.

Figure 7 is a perspective view of the roller of the document removal mechanism.

Figure 8 is a front view of the canister showing the buttonholes divided into subsets.

Figures 9 through 13 show arrangements of buttons in the subsets of buttonholes.

Best Modes for Carrying Out Invention

The preferred embodiment of the present invention is used in conjunction with the friction picker mechanism for removing documents from a document canister in an ATM described in United States Patent No. 4,494,747 and assigned to the assignee of the present invention, which patent is incorporated herein by reference in its entirety. Portions of the friction picker mechanism are shown in the drawings. Features of the friction picker mechanism not essential for understanding the present invention have been deleted for clarity and brevity.

Referring now to the drawings and specifically to Figure 1, there is shown a document canister generally designated 10. The canister 10 is better shown and described in European Patent Application No. 90112217.6 to which reference should be made for more details.

In brief, the canister is composed of a lower portion 11 consisting of sidewalls 12, bottom wall 14, partial front wall 15, and back wall 16. Canister 10 also has a top 18 which includes flanges 20, which extend over side walls 12 and back wall 16 when the top is in its closed position. Flanges 20 terminate in thickened portions 22 near the front of the canister. Top 18 also incorporates a face plate 24 which has a plurality of buttonholes 26 and a guide pin hole 27. Thickened portions 22 of flanges 20 terminate in ears 23. Ears 23 cooperate with hinge means 28 attached to lower portion 11 which allows top 18 to be opened as shown in Figure 2. Top 18 and lower portion 11 are preferably made of molded plastic construction. Canister 10 also incorporates locking means generally indicated 29 which may be used to selectively fasten top 18 to lower portion 11. A plurality of buttons 25 are located in and extend through certain of buttonholes 26, the arrangement of said buttons being significant to the present invention as later explained.

As shown in Figure 2, the canister 10 contains a stack of paper currency 30. The stack is supported off the bottom of the canister on a shelf portion 31 and held between guide rails 32 which extend upwardly from canister bottom 14. A pusher plate 36 (see Figure 4) contacts the rear of stack 30. Pusher plate 36 includes a foot portion 38. A slot 40 is cut into and extends longitudinally along the center of shelf portion 31. Guide means (not shown) attached to foot 38 limit the movement of pusher plate 36 to along slot 40. Force application means (not shown) applied to pusher plate 36 tend to move pusher plate 36 and stack 30 in the direction of arrow A. This force causes the bill located at the front of the stack 30 to be present at the opening in partial front wall 15 of the canister generally designated 34. Opening 34 is open during removal of documents from canister 10; however, closure means are normally provided to secure opening 34 when the canister is outside an ATM. The interior portion of partial front wall 15 contacts the upper portion of the first bill in stack 30 and counteracts the force applied to the stack by pusher plate 36, thus retaining the stack inside the canister.

Figure 3 shows a currency friction picker mechanism 100 which removes currency from canister 10. The operation of picker mechanism 100 is described in detail in United States Patent No. 4,494,747 which is incorporated herein by reference. Each canister 10 in the ATM operates in conjunction with a corresponding picker mechanism 100. The picker mechanism is housed in a frame 101. Frame 101 includes a canister mounting plate 103. A roller member 102 is mounted on a shaft 106. Shaft 106 extends between bearing means 108 which extend through frame 101. Roller member 102 incorporates two (2) grooved portions 110 (see Figure 7). The circumference of roller 102 is smooth except for high friction rubber portions 112. Roller 102 also incorporates cam means 114. Picker mechanism 100 also has a pair of stripper rolls 116 which are mounted on a shaft 118. Shaft 118 is positioned such that the outer circumferences of stripper rolls 116 lie within grooves 110 of roller 102 (see Figure 6). Shaft 118 is mounted on bearing means (not shown) which extend through frame 101. During operation, shafts 118 and 106 are driven by drive means (not shown) such that both rotate in the counter-clockwise direction as shown in Figure 6. A U-shaped lever 120 rides on a shaft 122 which is mounted to frame 101 by mounting means (not shown). U-shaped lever 120 has two legs 124, the inside of which maintain contact with cam means 114 during the operating cycle of the picker mechanism.

Frame 101 of picker mechanism 100 includes a switch plate 126. Switch plate 126 incorporates a series of holes (not separately shown) through which extend actuators 128 of electrical switches 130. A guide pin 132 is fixably mounted to, and extends outward from switch plate 126 (see Figure 5).

When picker mechanism 100 receives canister 10 so that documents can be removed therefrom, bottom 14 of canister 10 is placed on canister mounting plate 103 of frame 101 of the mechanism. In moving canister 10 into operating position, opening 34 in partial front plate 15 of the canister moves towards roller 102 of the picker mechanism until the currency stack 30 contacts lever 120 (see Figure 6). When the canister is fully inserted, head 134 and shaft 136 of guide pin 132 are accepted into guide pin hole 27 of canister 10. This fit insures that canister 10 is properly aligned with respect to picker mechanism 100. When documents are to be dispensed, roller 102 of picker mechanism 100 rotates in the direction of arrow C. U-shaped lever 120 is controlled by cam 114 and holds stack 30 away from roller 102 except at those times during rotation when the high friction portion 112 is in position to contact stack 30. This rotational movement of roller 102 causes the first bill to be removed from stack 30 by the grabbing action exerted by high friction portion 112. As a consequences the first bill in stack 30 is pulled downwards into stripper rolls 116 which are rotating in the same rotational direction as roller 102. The action of stripper rolls 116 insure that only one (1) bill at a time is removed from stack 30 and that any additional bills are pushed or stripped backwards into the stack. Further rotation of roller 102 causes the first bill to be pulled past stripper rolls 116 due to the frictional characteristics and large surface area of high friction portion 112. Once the first bill has been pulled off stack 30 and past stripper rolls 116, it is moved by transport means (not shown) to a location for delivery outside the ATM.

Buttonholes 26 in canister 10 are positioned such that when the canister and picker mechanism 100 are in operating position the buttonholes are in alignment with actuators 128 of switches 130, which actuators extend through switch plate 126 (see Figure 5 and 6). The cylindrical portion 44 of buttons 25 are of sufficient length that flat portions 48 contact actuators 128 and push buttons 25 inward. The action of spring assemblies and a backing plate (not shown) resists the inward movement of buttons 25 as canister 10 is moved into operating position. This reaction force causes actuators 128 which serve as sensing means, to be depressed. The spring loaded action of buttons 25 insures that actuators 128 contact all of the buttons in the arrangement even if face plate 24 and switch plate 126 are not perfectly parallel. Electrical switches 130 serve as signal generating means which exhibit a first electrical condition when their corresponding actuators 128 are not in contact with buttons 25 and a second electrical condition when actuators 128 are in contact with buttons 25. Electrical switches 130 are connected to the computer which controls the operation of the ATM.

Though actuators 128 correspond to the location of each buttonhole 26, buttons 25 are located only in certain selected holes. According to the preferred embodiment of the present invention, the arrangement of buttons is representative of information. Through the action of switches 130 which change their electrical condition in response to the presence of buttons, the button arrangement on the canister is transferred into a corresponding arrangement of electrical signals. Each button 25 is an information indicating means which may have one of two conditions; a first condition when a button is present and second condition when a button is absent.

A button 25' (Figure 5) like buttons 25 extends through a buttonhole 26 in canister 10. Button 25' corresponds to a particular switch actuator 128 on switchplate 126. Button 25' however differs from the other buttons in that it is not spring-loaded. Button 25' does not normally contact its corresponding actuator when canister 10 is loaded. As currency stack 30 is depleted due to removal of currency, pusher plate 36, which is a tracking means tracking the end of the stack 30, moves forward in canister 10. Eventually a flag 96, which is a position indicating means, contacts a flag sensing means (not shown) inside the canister 10. Further movement of pusher plate 36 causes flag 96 to exert a force on the flag sensing means, which is transmitted to a link 66 which slides forward. As link 66 slides forward button 25' contacts its switch actuator 128' (see Figure 5). Further exertion of force by flag 96 on pin 88 causes button 25' to push on actuator 128' which changes the electrical condition of its corresponding switch 130' (not separately shown). This change in electrical condition is sensed by the computer that controls the operation of the ATM. Further forward movement of pusher plate 36 causes flag 96 to "wipe" past the flag sensing means inside the canister and thus a force is no longer exerted. The release of this force results in button 25' no longer pushing on actuator 128' and the electrical condition of switch 130' reverts to its original condition. Thus button 25' is an information indicating means which indicates the position of pusher plate 36 and thereby the number of documents remaining in stack 30.

The arrangement of buttons 25 in buttonholes 26 on canister 10 is representative of information.The arrangement is reproduced through the depression of switch actuators 128 and is electrically represented in the electrical signals generated by switches 130. The computer controlling the operation of the ATM to which the switches 130 are connected is programmed to recognize each possible arrangement and to correlate the arrange-

ments with the information each represents. The computer then stores and processes this information according to its programming to do such things as monitor canisters involved in dispense failures, settle accounts between parties who operate a network that the ATM may be part of, control the picker mechanisms to insure the correct amount of currency is dispensed, and adjust the operation of the picker mechanisms to conform to the documents in the canisters.

According to the preferred embodiment of the invention, buttonholes 26 are divided into groups or subsets. Each subset is designated as representing a particular type of information. Figure 8 shows canister 10 with the buttonholes 26 in face plate 24 holding no buttons. Buttonholes 26 are divided into six (6) subsets shown separated by dotted lines. A first subset 136 and a second subset 146 are the subject matter of European Patent Application No. 91111932.9 from which the present Application has been divided.

The first subset 136 is designated to represent ownership of the canister and the contained currency. As subset 136 has a pair of holes in which buttons can be placed, there are a maximum of four (4) different ways in which buttons can be arranged in the holes of subset 136. These four (4) arrangements are shown in Figure 9. Ownership by a first bank is represented by arrangement 138, a second bank arrangement 140, a third bank arrangement 142, and a fourth bank by arrangement 144. The computer controlling the operation of the ATM is programmed to recognize the electrical signals generated by switches 130 in response to these arrangements and is further programmed to use the information to settle accounts between the banks. If more than four (4) banks supply canisters, the additional banks can be handled by adding additional buttonholes 26 to subset 136 and appropriately programming the computer.

The second subset 146 is designated to represent canister serial numbers. Canisters are assigned decimal serial numbers which are represented by buttons forming binary numbers. This is accomplished by having each buttonhole in subset 146 represent a binary digit; absence of a button in a buttonhole representing a "0", and the presence of a buttonhole representing a "1". A subset 146 comprises six (6) buttonholes, the number of decimal serial numbers which can be represented are $(2)^6$ or 64. Arrangements of buttons in subset 146 for canisters having serial numbers zero through 38 are shown in Figure 10. Serial numbers in excess of 64 are obtained by adding additional buttons to subset 146. Information on serial numbers of canisters involved in dispense failures can be stored in the memory of the computer and analyzed to determine canisters that may have defective conditions. Further, because ownership of each canister is indicated by the arrangement of buttons in subset 136, the computer can distinguish between canisters of different owners which have the same serial number.

According to the present invention, a third subset 148 is designated to present document character. This subset contains a pair of buttonholes each of which comprises a sub-subset. The sub-subset 150 consisting of the upper buttonhole in subset 148 (see Figure 12) indicates document type. According to the preferred embodiment of the present invention, the ATM dispenses two (2) types of documents; paper currency and coupons which are approximately the same physical size as paper currency. The absence of a button in sub-subset 150 indicates that the documents in the canister are currency. The presence of a button indicates coupons. The computer operating the ATM is programmed to recognize the data represented by this arrangement and to control the operation of the various picking mechanisms to dispense currency or coupons according to what is requested. In addition, as coupons may be optimally dispensed at a different rate than currency, the computer is programmed to adjust the rotational speed of roller member 102 and stripper rolls 116 of the picker mechanism 100 to a predetermined speed optimum for the dispense of coupons when the button is present.

Sub-subset 152 is the other subset of subset 148. It includes a single buttonhole. Sub-subset 152 represents data on the new or used character of the documents in the canister. The presence of a button in the hole represents new documents whereas the absence of a button represents used. As new and used documents are optimally dispensed at different speeds, the computer is programmed to adjust the speed of picker mechanism 100 based on the new or used character of the given type of documents. Thus there are four (4) possible arrangements or buttons in subset 148 shown in Figure 11. These clockwise from upper left, are: used currency, used coupons, new coupons, and new currency.

A fourth subset 154 of buttonholes 26 is designated to represent document denomination. As subset 154 contains a pair of holes, four (4) denominations may be represented as shown in Figure 12. These arrangements of buttons in subset 154 are assigned to represent from top to bottom in Figure 15, $1, $5, $10, and $20 denominations. The computer controlling the operation of the ATM is programmed to recognize these arrangements and to control the operation of the picking mechanisms according to the denomination of the documents in the canister loaded adjacent to each picking mechanism. Thus regardless of the positions of

the various canisters in the ATM, the correct type and denomination of documents is dispensed.

A fifth subset 156 contains button 25' which is a means for indicating the status of documents inside the canister. As was previously explained, the condition of button 25' varies with the number of documents remaining in the canister. Button 25' causes the production of a signal each time a pre-established document level is reached. The computer is programmed to count the signals caused by button 25' and to provide an indication of the number of documents remaining in each canister as well as when each canister needs to be replenished.

A sixth subset 158 is used to verify that the data reported by the arrangements of buttons in subsets 136, 146, 148, and 154 have been received. This is accomplished by buttonholes representing decimal numbers through binary digits as previously explained. The number of buttonholes required in the verification subset is determined by the maximum number of buttons that could possibly be present in all the other subsets, excluding subset 156. If for example, there are potentially sixteen (16) buttons that could be located in all the other subsets, the data for verification subset 158 would require four (4) buttonholes. This is so because a number comprised of four (4) binary digits may have up to $(2)^4$ or sixteen (16) different combinations. The condition of subset 156 cannot be verified by the verification subset 158 as its condition varies with the document supply and is not pre-established as is the case with other subsets.

Upon insertion of canister 10 into operating position relative to picker 100, the computer receives signals from switches 130 representative of the arrangements of the buttons in subsets 136, 146, 148, 154, and the verification subset 158. The computer is programmed to calculate the number of signals received on account of the various buttons 25, exclusive of the buttons in the verification subset, and determines the total. Thereafter the computer reads the signals from the verification subset, transforms the signals into a binary number, and converts the number to a decimal number which is compared to the total of buttons found in the other subsets. If the values compared do not coincide, the computer is programmed to give a signal indicating a fault condition. The arrangement of buttons in subset 158 representing zero (0) through twelve (12) buttons, which are the total number of buttons which may be present in subsets 136, 146, 148, and 154 are shown in Figure 13.

Other subsets of buttonholes 26 could be designated to represent other information based on the needs of the operator of the ATM. The number of buttons and thus the amount of information which can be presented on one canister is limited only by physical constraints such as the size of face plate 24, switch plate 126, buttons 25, and switches 130. One way of reducing the space occupied by actuators 128 and switches 130 is to use a single conductive array of tactile switches such as an FL-type array manufactured by S.P. America Inc., of San Jose, California, in lieu of individual switches.

Once information is placed on canister 10 through an appropriate arrangement of buttons 25, the computer will read the information and operate to dispense documents from the canister according to the information presented. The buttons on canister 10 are not subject to tampering as they are mounted from behind face plate 26 and must be removed from inside canister 10 which is normally secured by locking means 29. In addition, buttons 25 are made of durable plastic material and are not subject to breakage. The arrangement of buttons is not sensitive to vibration, shock or changes in temperature. If, however, it is desired to place a different denomination or type of document in a canister, a change in button arrangement may be easily accomplished so that the computer will operate using the canister in conformance with the new document. To change the button arrangement, the locking means of canister 10 is opened and spring assemblies 54 removed. Removal of these parts releases backing plate 50. Removal of backing plate 50 provides access to button holes 26 and the rear of buttons 25. Buttons 25 may then be relocated, removed, or new buttons installed. Backing plate 50 and spring assemblies 54 are reinstalled by reversing the disassembly process. Thus the rearrangement of buttons may be accomplished quickly and by persons without particular technical expertise.

The foregoing apparatus may be used to present information on document canisters in machine readable form which can be utilized for a variety of purposes in a document dispensing system. The invention is inexpensive to implement, reliable and is not subject to failure due to human error or mishandling of the equipment involved. The invention is resistant to tampering and yet information presented according to the invention may be easily modified by authorized personnel not having technical skill.

Thus, the apparatus for identifying and indicating the constants of document canisters achieves the above-stated objectives, eliminates difficulties encountered in the use of prior apparatus, solves problems, and obtains the desirable results described herein.

In the foregoing descriptions certain terms have been used for brevity, clarity, and understanding; however, no unnecessary limitations are to be implied therefrom because such terms are for de-

scriptive purposes and are intended to be broadly construed. Moreover the description and illustrations given are by way of example and the invention is not limited to the exact details shown or described. Having described the features, discoveries, and principles of the invention, the manner in which it is utilized, and the advantages and useful results obtained, the new and useful methods, structures, devices, elements, arrangements, parts, combinations, systems, equipment, operations, and relationships are set forth in the appended claims.

Claims

1. Apparatus for dispensing documents, including at least one removable container (10) for holding a supply of documents (30) and a machine associated with said container, said apparatus comprising:

   a housing (101) of said machine, said container (10) mounted on said housing during operating of the apparatus;

   a picker mechanism (100) mounted on said housing in operative connection with said container for removing documents from the supply for dispense;

   a plurality of information indicating means (25, 26) associated with said container;

   a plurality of sensing means (12) associated with said machine; and

   control means (130) in operative connection with said sensing means controlling the picker mechanism (100), the said indicating means (25, 26) being selectable between a first condition and a second condition, an arrangement of said conditions representing a characteristic of said documents, and being changeable to produce different arrangements representing different characteristics of said documents, characterised in that the said control means (130) adjust how the picker mechanism (100) operates in accordance with the characteristic represented by the selected arrangement of the indicating means.

2. The apparatus according to Claim 1, characterised in that the characteristic is a physical property of the documents (30) in the containers (10), and said control means adjust an operating parameter of the picker mechanism (100) according to said physical property.

3. Apparatus according to Claim 2, characterised in that the said control means (130) adjust the speed of the picker mechanism (100).

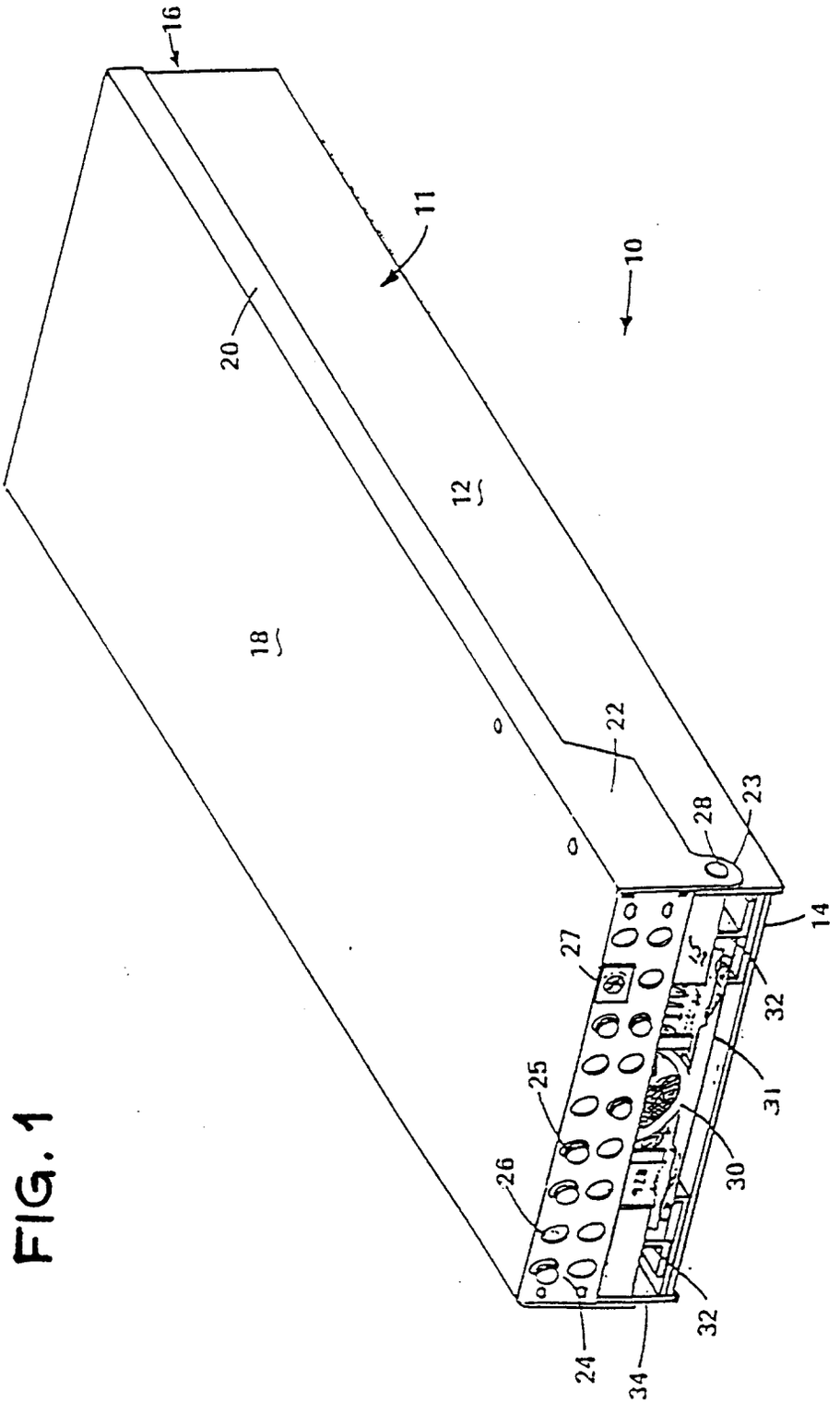
4. Apparatus according to Claim 3, characterised in that the said control means (130) adjust the speed of the picker mechanism (100) in response to whether the documents (30) in the container (10) are currency bills or coupons.

5. Apparatus according to Claim 3, characterised in that the said control means (130) adjust the speed of the picker mechanism (100) in response to whether the documents (30) in the container (10) are new or used.

6. Apparatus according to Claim 1, wherein the picker mechanism (100) comprises a rotatable feed roller member (102), characterised in that the said control means (130) adjust rotation of the said feed roller member (102).

7. The apparatus according to Claim 1, characterised in that the documents (30) are paper currency bills and the physical characteristic is associated with previous use of the currency bills in the container (10), said picker mechanism (100) comprises a feed roller member (102) and a stripping roller (116) and said control means adjusts the speed of said feed roller member (102) to rotate at a first speed when there is previous use and a second speed in the absence of previous use of said currency bills.

FIG. 1



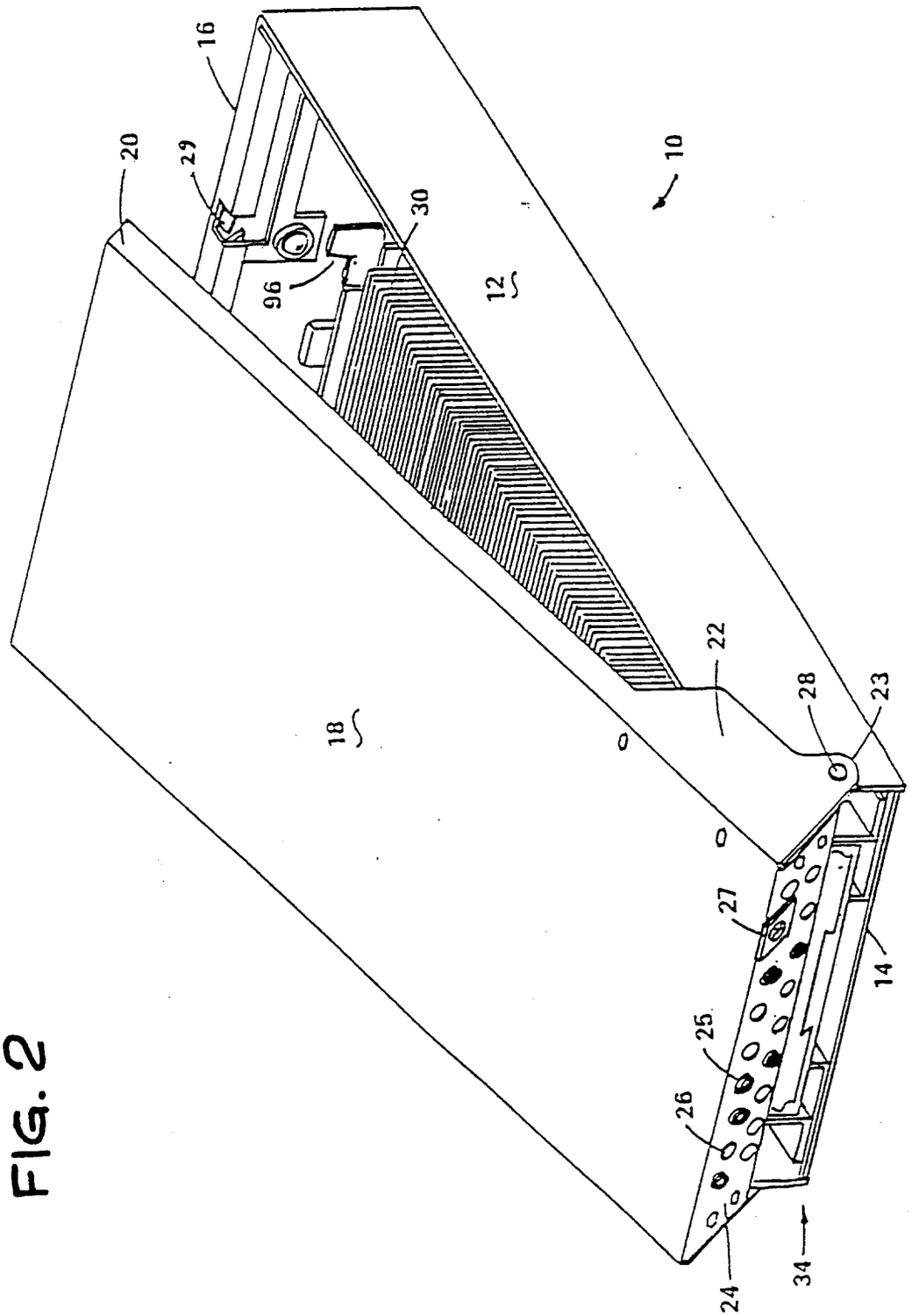


FIG. 2

FIG. 3

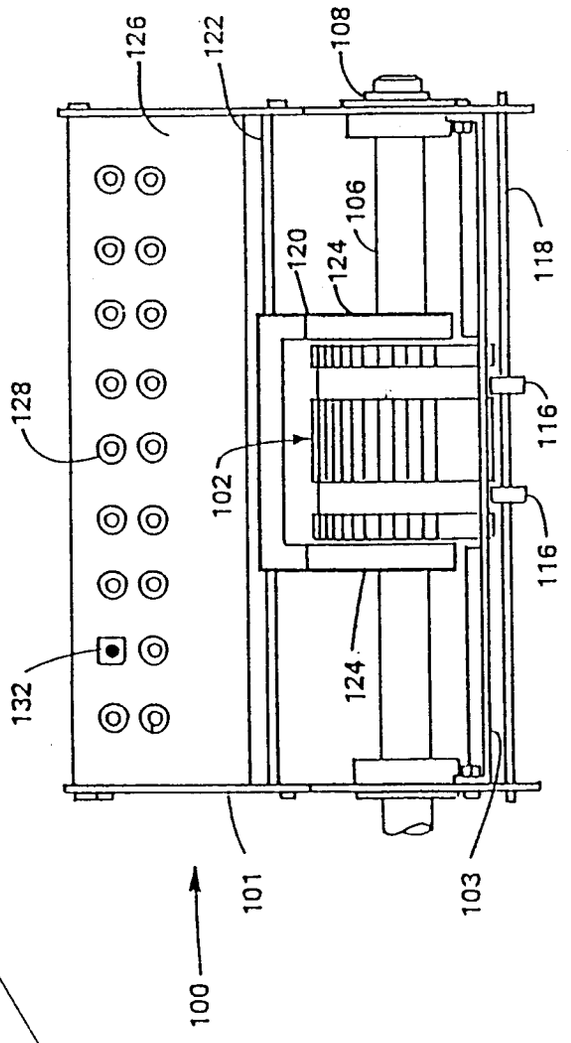

126
122
108
106
120
124
118
128
102
116
116
132
124
100
101
103

FIG. 4

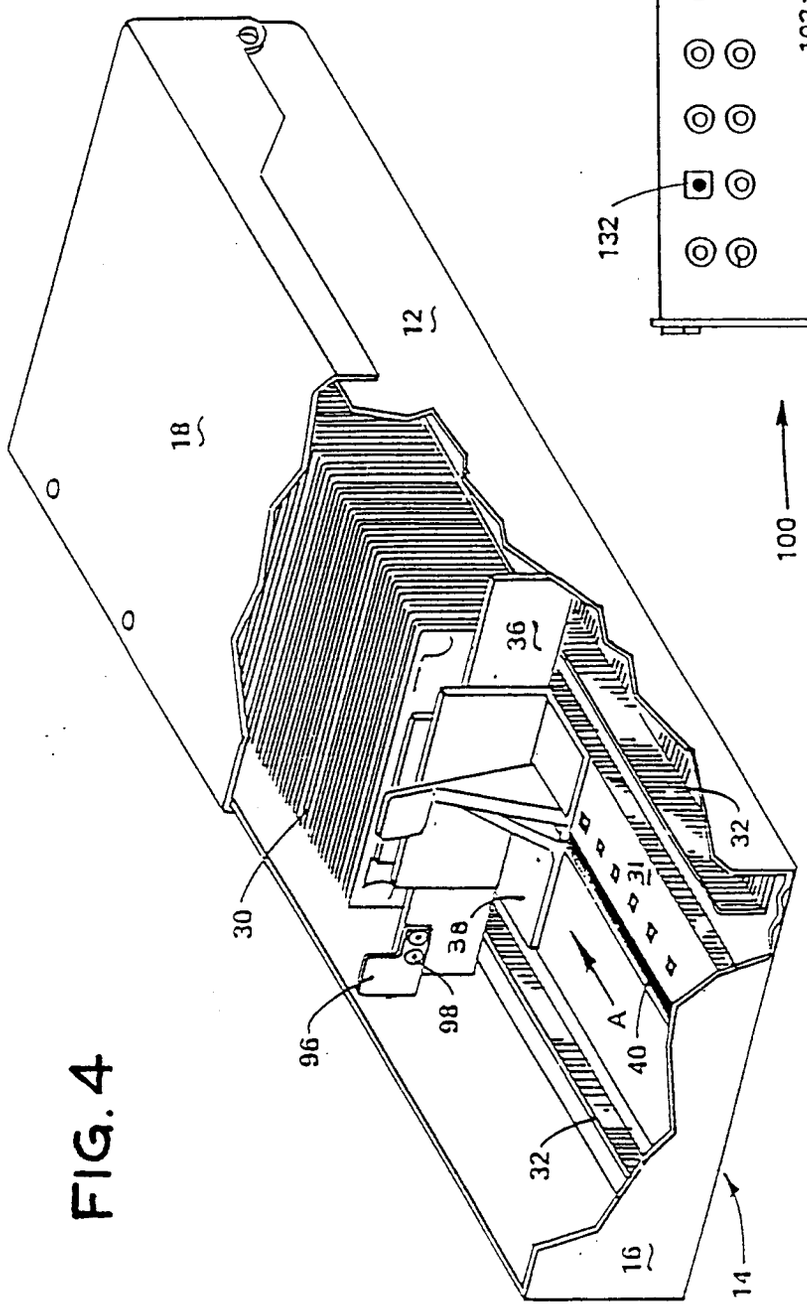

18
12
36
32
30
31
38
98
96
A
40
32
16
14

FIG. 5

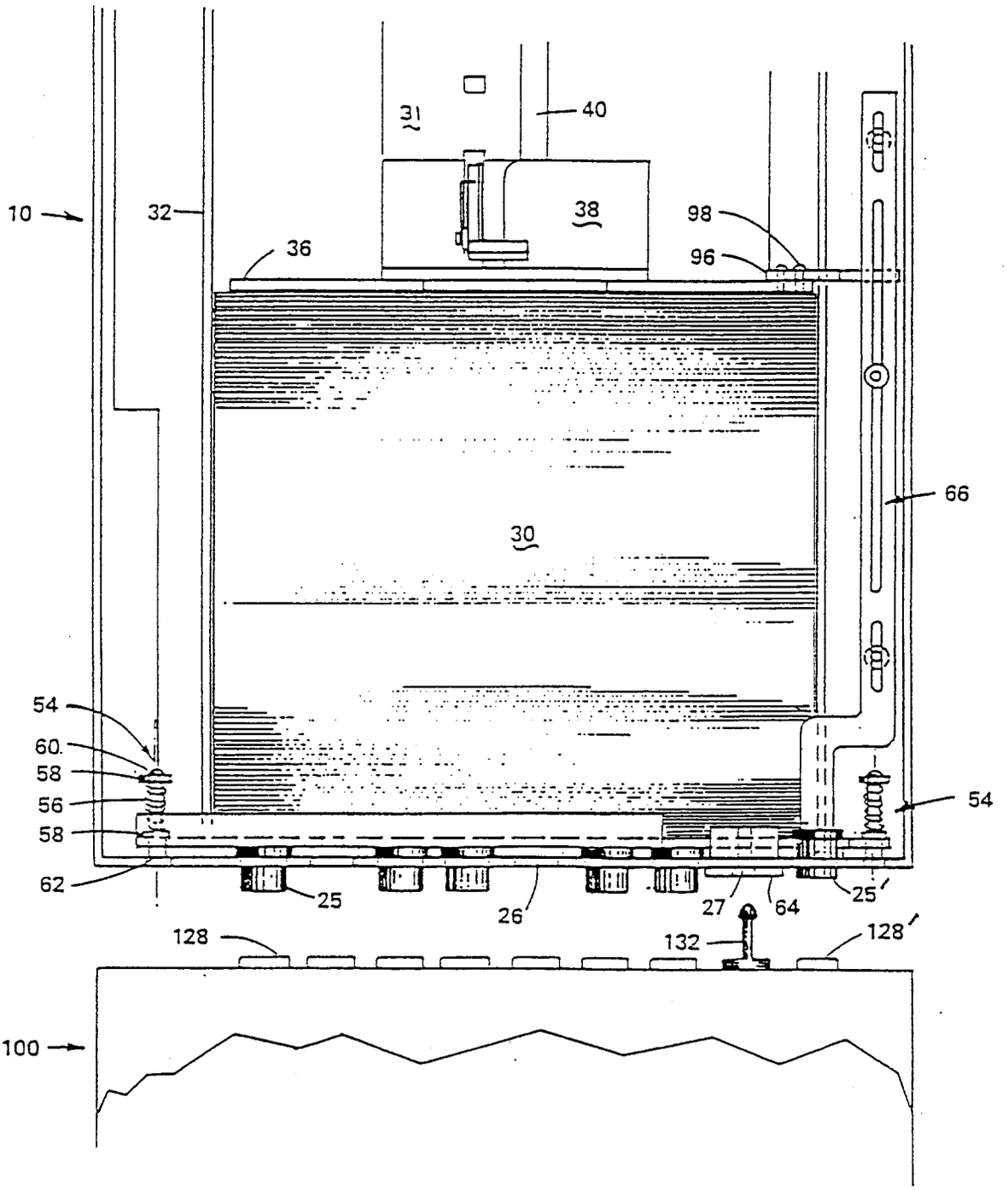

10
32
31
40
38
36
98
96
66
30
54
60
58
56
58
62
25
26
27
64
25
54
128
132
128
100

FIG. 6

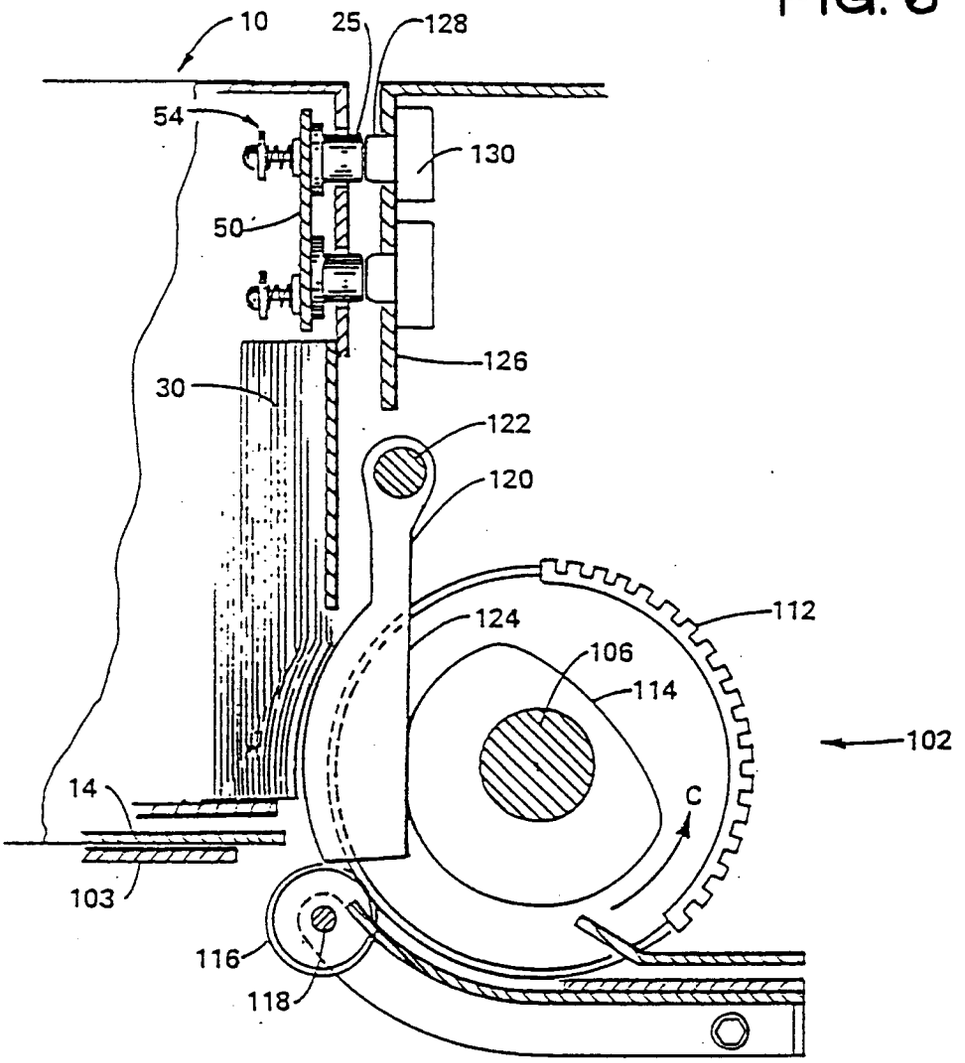

10
25
128
54
130
50
126
30
122
120
112
124
106
114
102
14
C
103
116
118

FIG. 7

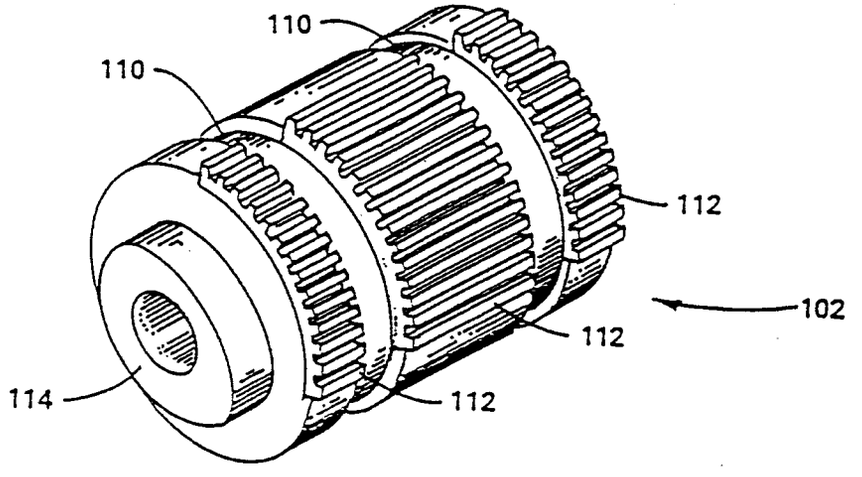

110
110
112
102
112
114
112

FIG. 8

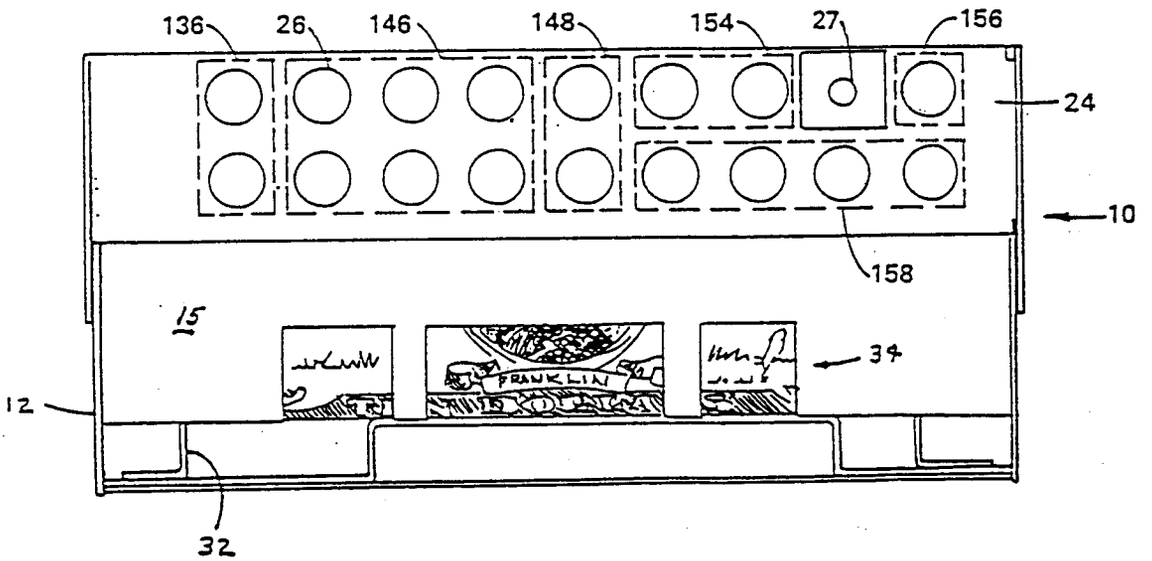


FIG. 9

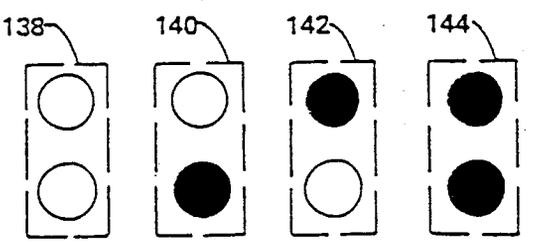


FIG. 10

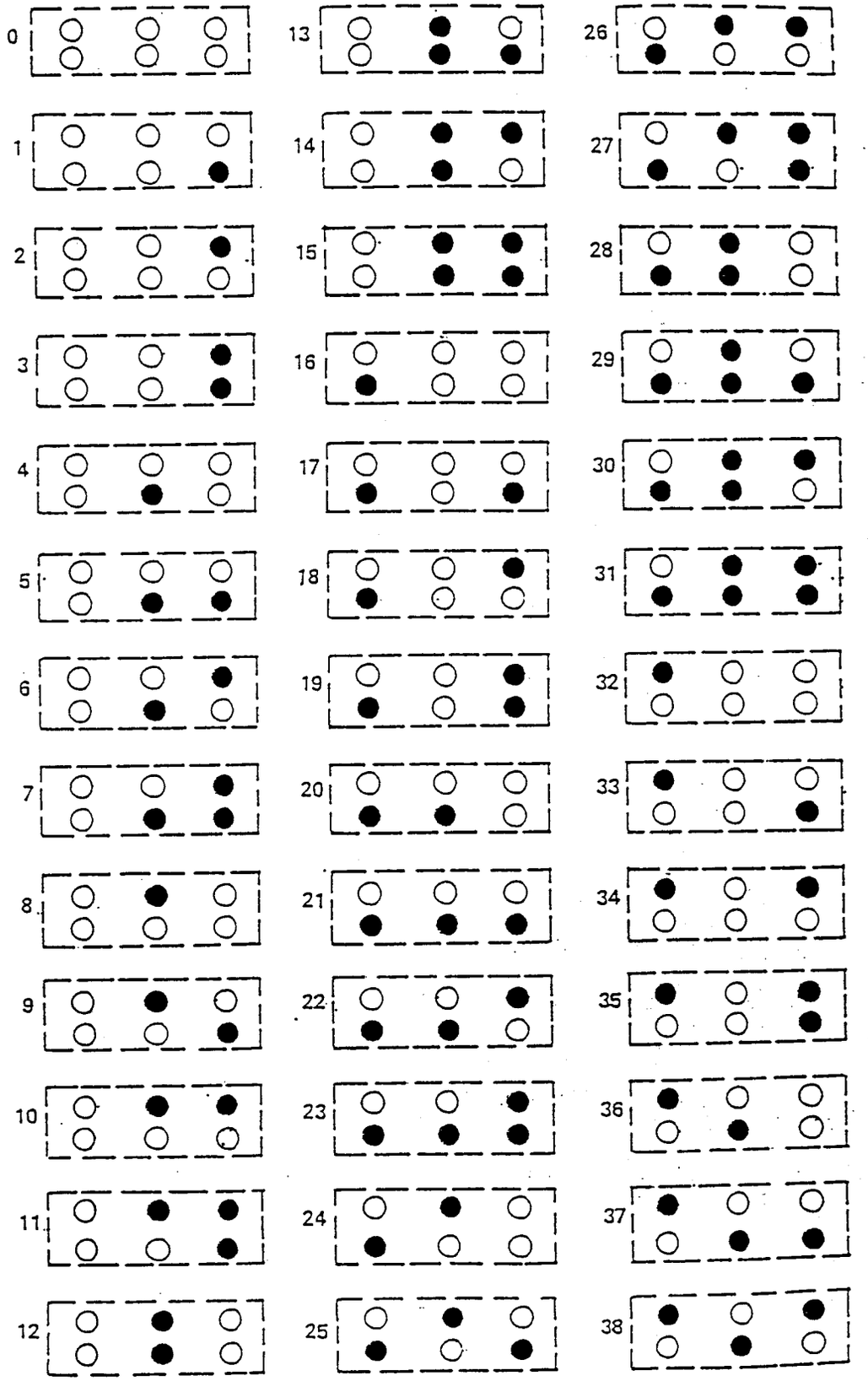

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38

FIG. 11

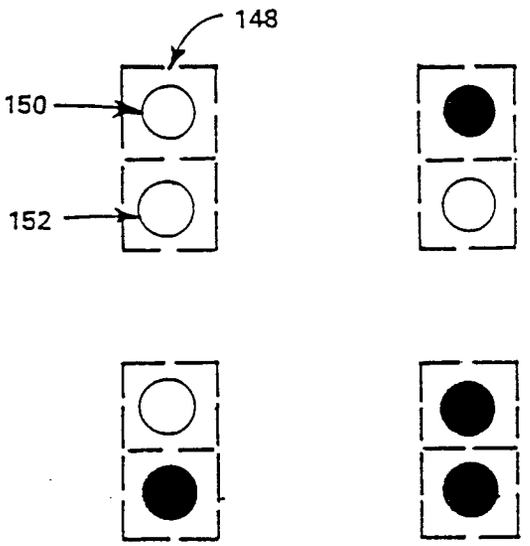


FIG. 12

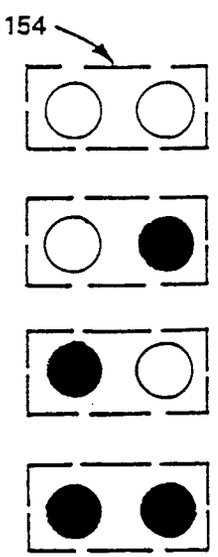


FIG. 13