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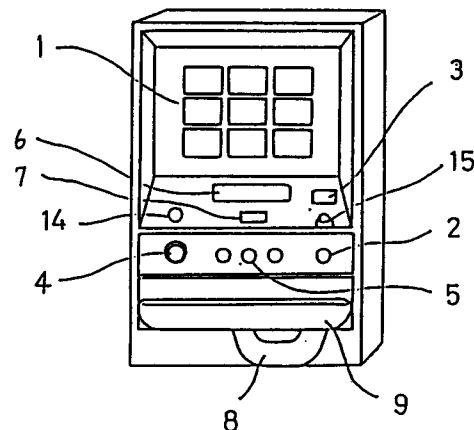
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SLOT MACHINE.

In a slot machine mounted thereon with a drum, a game medium insertion switch, a game medium insertion count counter, a start handle and a drum stopping switch, the slot machine is further provided with a count display portion capable of displaying the number of inserted game media and count-down, and a game end switch.

FIG. 1



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FIELD OF TECHNOLOGY

This invention relates to a slot machine which is to be started by inserting tokens or coins into a slot, and in which the object is to subsequently display, change and stop symbols at preset times.

BACKGROUND TECHNOLOGY

With a conventional slot machine, up to three tokens or coins (hereinafter called "tokens") are individually inserted into a slot to subsequently rotate three drums displaying symbols. Stop buttons are then depressed to stop the rotation of the drums. Depending on the combinations of the stopped symbols, a predetermined number of tokens are dispensed as a prize (as disclosed in Japanese Utility Model Laid-Open Publication No. SHO 54-130590 and Japanese Utility Model Publication No. HEI 2-227).

While playing a game with this conventional slot machine using a lot of tokens, the player has no way of knowing the number of remaining tokens at hand, apart from frequently looking at the front tray, into which tokens dispensed as prizes are received. When the quantity of tokens collected in the front tray progressively increases, the player must be careful of tokens flowing over the front tray and this tends to distract the player's attention from the playing of the game.

Generally the tokens come in the form of either individual tokens or in packages. A player buys 50 units worth of tokens or a package of tokens for one thousand yen. The individual 50 unit tokens are counted while being discharged from a hopper, whereas the 50 unit packages are wrapped in paper or plastic.

With the conventional slot machine, tokens can be inserted into the slot one by one quite easily. However, when the player uses a package of tokens, he/she must tear the package to take out the individual tokens and throw away the wrapper, which is a nuisance.

A further problem is that due to tearing the package to take out the individual tokens and then discarding the wrapper, an amusement parlor becomes dirty with a large number of wrappers, and it gives a bad impression. So as to not let these wrappers give a bad impression, the floor must be swept frequently, so there is a problem that the parlor management cost increases.

DISCLOSURE OF THE INVENTION

Therefore it is an object of this invention to provide a slot machine which can display the number of remaining tokens which varies during a game.

Another object of the invention is to provide a slot machine which is operated by inserting loose tokens or at least one package of tokens and in which the packages can be inserted into the slot without being unwrapped, thus the player does not need to dispose of the wrapping and the amusement parlor stays clean and tidy.

According to a first aspect of the invention, there is provided a slot machine equipped with a count display for displaying a number of tokens inserted and subsequently a diminishing number of tokens counted down as they are used.

According to a second aspect of the invention, there is provided a slot machine which is to be started by inserting tokens into at least one slot and by a game start switch in order to turn, change and stop a plurality of symbols at preset times, wherein the tokens include at least two kinds of tokens, such as individual tokens and a package of tokens being worth a plurality of individual tokens, which are checked by identifying units to enable games to be played depending on the number of inserted tokens.

In this slot machine, when tokens are inserted into a front tray or when a paper currency note is inserted into a token dispenser to dispense tokens, the count display displays the number of tokens inserted or dispensed. Then when a token collecting switch is depressed, the count display displays the number of tokens as counted down by the number of tokens collected. After a game, if the player loses the game, the reduced number of tokens is displayed on the count display, and if the player wins the game, the increased number of tokens is displayed, and at the same time the number of tokens as a prize is dispensed into the front tray.

The slot machine enables the player to insert individual tokens or packages of tokens into the appropriate slot.

If the slot machine has a total number memory, the player can insert the required number of tokens into the appropriate slot. The inserted tokens are checked by identifying units, totalled by the total number memory, and then displayed on a total number display. Token collecting switches are operated to determine the number of tokens to be collected for each game. There is a game start switch to set the game in action. The number of tokens for each game is determined by the number of tokens which is displayed by a collect token display. After starting the game it is possible to subtract the number of tokens to be collected for each game from the number of tokens that have been inserted and to store the result in the total token number memory. The total number display indicates the number of tokens remaining.

As soon as the game start switch is activated,

several display drums show different symbols. When stop switches are operated, the symbol display drums stop turning at preset times. Combinations of the symbols on the symbol displays can be checked. When a certain combination of symbols indicates a prize, the number of tokens to be dispensed, which is stored in a result memory, can be selected and displayed by the result display. The number of tokens to be dispensed for the prize is calculated by adding them to the number of tokens stored in the total number memory. The total is then indicated on the total number display.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a slot machine according to a first embodiment of this invention; FIG. 2 is a perspective view of a modified slot machine; FIG. 3 is a perspective view of another modified slot machine; FIG. 4 is a block diagram showing the functions of the slot machine of the first embodiment; FIG. 5 is a front view of the slot machine; FIG. 6 is a perspective view showing a package of tokens and an individual token; and FIG. 7 is a perspective view showing a different type of token according to a second embodiment of the invention.

PREFERRED EMBODIMENT OF THE INVENTION

FIGS. 1 to 3 of the accompanying drawings show the first embodiment of this invention.

A number of slot machines are installed concentrated into an island, and each machine comprises drums 1, a token collecting switch 2, a collected-token counter 3, a start handle 4, drum stop switches 5, a count display 6, a game-over switch 7, a front tray 9 with a hopper 8, a token inserting switch 14, and a token collecting slot 15.

In operation, when the token inserting switch 14 is activated after tokens purchased from a token dispenser have been put into the front tray 9 and the hopper 8, these tokens will be inserted into the slot machine while being automatically counted up, and the number of tokens inserted will be displayed on the count display 6.

When the token collecting switch 2 is depressed to play a game, the collected-token counter 3 will count up the collected tokens while the tokens inserted will be counted down by the number corresponding to the number of collected tokens. After the drums 1 are rotated by manipulating the start handle 4, when the drum stop switches 5 are activated to stop the respective drums 1, a result will be shown. If the result shows a win, a predetermined number of tokens will be dispensed as a prize into the front tray 9, depending on the level of the win. If the result shows a loss, the

number of previously inserted tokens will disappear and the game will come to the end. By reactivating the token collecting switch 2, the game machine will be started repeatedly until the number of inserted tokens on the display shows 0.

Assuming that the number of inserted tokens on display comes to or approaches 0, if there are tokens still remaining in the front tray 9, it is possible to continue playing subsequent games by activating the token collecting switch 14. When the game-over switch 7 is depressed, the hopper for dispensing prizes inside the slot machine will be activated to dispense the inserted tokens until the number on the display shows 0. At that time, if the number of inserted tokens on display is not 0, the player withdraws the tokens and then takes them to an amusement parlor exchange counter to exchange them for prizes.

The count display 6 may only count up the number of inserted tokens if the result is a win, depending on the level of the win; that is, no tokens will be dispensed into the front tray 9.

FIG. 2 shows a modified slot machine. Modified parts or elements include a token dispenser 10 with a paper currency inlet 16, and a front tray 11. When a paper currency note is inserted into the inlet 16 of the token dispenser 10, a count display 6 displays a count value equivalent to the value of the inserted paper currency. Also with this arrangement, if the result of a game is a win, the count display 6 will only count up the number of inserted tokens depending on the level of the win. That is, no tokens will be dispensed into the front tray 11.

FIG. 3 shows another modified slot machine. The reference numerals which designating modified parts or elements, include a token dispenser 12 equipped with a paper currency inlet 16 installed on the side of the slot machine, and a receipt/card outlet 13 situated in a lower portion of the slot machine or in a lower portion of the token dispenser 12. If the result of a game is a win, the count display 6 will count up the number of inserted tokens depending on the level of the win. Then, when the game-over switch 7 is depressed, a receipt issuing unit or a card issuing unit will be activated to record on a receipt or card the number displayed on the count display 6 and then to eject the receipt or card from the receipt/card outlet 13 so that the player may take it to the exchange counter to exchange it for prizes.

When a one-thousand-yen note, for example, is inserted, the token dispenser, in which a result counter is mounted, does not dispense tokens into the front tray until signals for driving and stopping the motor of the hopper and the prize token dispensing hopper of the slot machine are controlled from outside by interrupt control. The token dispenser may be a double-inlet type, which can be

conveniently used by the respective players at two slot machines one on each side of the dispenser.

FIGS. 4 through 6 show the second embodiment of this invention.

As shown in FIG. 5, two slots to receive the tokens are provided on the front of the machine body 110 of a slot machine 101. An individual token 111 or a token package 113 can be used in the slot machine 101. The token package 113 includes 50 units worth of tokens for a thousand yen, which is equivalent to 50 unit tokens 111. FIG. 6 shows the tokens in a package 113a, on which the name of an amusement parlor 113b and an identification code 113c such as bar codes are printed. The identification code 113c is used to check whether or not the token package is standard at the amusement parlor, and it is preferably difficult to copy.

The lower slot 114a is for inserting single tokens one by one, and the upper slot 114b is for the token packages.

Three symbol displays 121a, 121b, 121c are located on the front of the machine body 110. These displays 121a, 121b, 121c include a row of three windows 122a, 122b, 122c next to each other on the front side of the slot machine body 110, three drums 123a, 123b, 123c located behind the three windows inside the machine body 110, and a non-illustrated means for driving the three drums separately. The drums 123a, 123b, 123c have several symbols such as figures, symbols etc. on the surface. The drums 123a, 123b, 123c are positioned at the display windows 122a, 122b, 122c so that the symbols on the drums are always visible through the display windows.

A switch 131 to start the game, a calculation switch 132 and two game medium collecting switches 133a, 133b are situated on the front of the machine 10. After individual tokens or packages are inserted into either of the slots 114a or 114b, the start switch 131 is turned on to start the game and the drums 123a, 123b, 123c rotate, displaying the different symbols 124 on the symbol displays 121a, 121b, 121c which are visible through the display windows 122a, 122b, 122c.

The calculation switch 132 is operated to return refundable tokens to the player. The token collecting switch 133a designates one unit worth of tokens to be consumed for each game and the token collecting switch 133b designates three units worth of tokens to be consumed for each game. Operation of either the collecting switch 133a or the collecting switch 133b, which designates up to three units worth of tokens to be consumed for each game, makes the number of symbol combinations different.

Stop switches 134a, 134b, 134c are situated on the front of the machine body 110, associated with

the respective symbol displays 121a, 121b, 121c. The stop switches are to stop the drums 123a, 123b, 123c, associated with the symbol displays 121a, 121b, 121c, rotating according to the preset times, thereby preventing the symbols 124 on the symbol displays from being changed.

Three digital displays are mounted on the front of the machine body 110. The uppermost one is a result display 135a indicating the number of tokens to be dispensed as a prize. The central one displays the remaining tokens 135b indicating the calculated number of remaining tokens. The lower one is a collect token display 135a indicating the number of tokens to be consumed for each game depending on whether the token collecting switches 133a or 133b are operated.

A return tray 136 is located on the front of the machine body 110 at the bottom. Following the operation of the calculation switch 132, the remaining tokens are totalled and dispensed into the return tray 136.

As shown in FIG. 1, identifying units 138a, 138b, an electronic control unit 140, a starter 151 and a prize dispensing means 152 are mounted inside the machine body 110. The identifying unit 138a, checks to see that the tokens which are inserted into the slot 114a are genuine and that they are single tokens. The identifying unit 138b checks to see that the token packages which are inserted into the slot 114b are genuine and that they are token packages, and automatically identifies the bar codes 113c of the token packages 113.

The electronic control unit 140 includes a total number memory 141, a token number determining means 142, a subtracting means 143, a result checking means 144, a result memory 145, a prize selecting means 146, and an adding device 147.

The total number memory 141 calculates and stores the number of tokens 111 or packages 113 which are recognized by the identifying unit 138a or 138b. The token number determining means 142 determines up to three tokens 111 to be collected per game when the token collecting switch 133a or 133b is switched on. The means 142 for determining the number of tokens keeps operating until the total number of tokens to be collected for the games exceeds the total number of inserted tokens, which is stored in the total number memory 141. The collected token display 135c displays the number of tokens to be collected per game, which is determined by the token number determining means 142.

The subtracting device 143 subtracts the number of tokens to be collected per game from the total number of tokens which is stored in the total number memory 141.

The starter 151 allows the game start switch 131 to be operated when the identifying unit 138a

or 139b identifies individual tokens 111 or token packages 113 and when the token number determining means 142 determines the number of tokens to be collected for each game. The token number determining means 142 can repeatedly determine the number of tokens to be collected per game so long as the number determined by this means 142 does not exceed the total number of inserted tokens in the total number memory 141. Therefore, if the symbol for no prize is displayed, the starter means 151 keeps the game start switch operable as long as the total number memory 142 or the token number determining means 142 does not store information indicating that there are no remaining tokens.

Following the operation of the stop switches 134a, 134b, 134c, the result checking means 144 checks whether combinations of symbols on the symbol displays 121a, 121b, 121c are prize winning combinations or not. Now it is assumed that the token collecting switch 133a is selected. In one example of the prize winning combinations, the same symbols, e.g. "7", appear in the central row of the symbol displays 121a, 121b, 121c and are visible through the three display windows 122a, 122b, 122c. When the token collecting switch 133a is pressed twice, the token number determining means 142 determines to collect two units worth of tokens for the game, and a winning combination may be when the same symbols are aligned across the top, central or bottom rows of the display windows 122a, 122b, 122c.

When the token collecting switch 133b is operated, examples of the prize winning combinations of the symbols are as follows: the same symbols appear simultaneously aligned across the top, central or bottom rows of the displays 121a, 121b, 121c, as described above; the same symbols appear diagonally aligned on the bottom row of the display 121a, central row of the display 121b, and top row of the display 121c; the same symbols appear diagonally aligned on the top row of the display 121a, on the central row of the display 121b, and on the bottom row of the display 121c.

The result memory 145 stores the number of tokens to be dispensed for each prize winning combination of symbols. Depending on the prize winning combination of symbols, the prize selecting means 146 selects the number of tokens to be dispensed accordingly, and this number is then stored in the result memory 145. When symbols 124 do not correspond to a prize winning combination, the prize selector selects "0" as the number of tokens to be dispensed. The result display 135a displays the number of tokens to be dispensed as the prize in response to the prize selector 146.

The adding device 147 adds and stores the number of tokens to be dispensed as the prize in

the total number memory 141. The remaining token display 135b displays the number of tokens stored in the total number memory 141, and the number of tokens added or subtracted by the adding or subtracting devices 143 or 147.

When the calculating switch 132 is in operation, the prize dispensing device 152 dispenses individual tokens or token packages as the prize through the return tray 136, depending on the number of tokens stored in the total number memory 141.

The electronic control unit 140 regulates the method described above by using a programmed microcomputer or an appropriate control unit equivalent to the microcomputer. For instance, a micro computer serving as the electronic unit 140 includes a CPU, a ROM, a RAM, and interfaces. The ROM stores the CPU's operation program and the RAM stores the preset display control signals.

The following is a description of how this slot machine operates.

The individual tokens 111 or token packages 113 are inserted into the slots 114a, 114b. The token packages 113 may be unwrapped and individually inserted into the slot 114a as individual tokens. The identifying units 138a and 138b check whether the individual tokens are genuine or not. If they are, the machine will accept them, and if not, they are rejected and returned via the tray 136. The rejected tokens may be inserted into the slot 114a or 114b again, or may be exchanged for new ones. If a token package 113 is rejected a second time, it may be unwrapped and the tokens inserted into the slot 114a one by one.

The number of individual tokens and token packages 113 is calculated by the total number memory 141, indicated by the total number display 135b. The token collecting switch 133a or 133b is operated so that the token number determining means 142 determines the number of tokens to be collected for each game, e.g. 1, 2 or 3. Then the start switch 131 is set in operation by the starter 151.

The starter 151 keeps the slot machine operable as long as the number of individual tokens 111 and token packages 113, which are identified by the identifying unit 138a or 138b and stored in the total number memory 141, is more than the number of tokens to be collected for each game, as is stored in the token number determining means 142.

The number of tokens to be collected is indicated by the collect token display 135c. When the start switch 131 is operated, the number of tokens to be collected is subtracted from the number of the inserted tokens stored in the total number display 141. Then the total number display 135b indicates the number of remaining tokens.

When the game start switch 131 is switched on, the drums 123a, 123b, 123c begin to rotate and symbols 124 are changed on the three symbol displays 121a, 121b, 121c. These symbols are visible through the windows 122a, 122b, 122c. When the stop switches 134a, 134b, 134c are operated, the three drums with symbols 124 are stopped at preset times.

Then various combinations of symbols 124 on the displays 121a, 121b, 121c are checked by the result checking means 144. When any of the current combinations are prize winning combinations, the amount of tokens awarded are stored in the result memory 145, selected by the prize selecting means 146 and displayed on the result display 135a. The player then knows how many tokens will be received as a prize.

When the number of tokens to be collected for future games is determined by operating the token collecting switch 133a or 133b, the number of tokens to be dispensed as the prize is calculated by the adding device 147 in relation to the number of inserted tokens stored in the total number memory 141. The additional number of tokens is displayed on the remaining token display 135b. Likewise, the number of tokens to be collected, which is determined by the token number determining means 142, is displayed on the collect token display 135c. The remaining token display 135b displays the number of remaining tokens from which the number of tokens to be collected for the games is subtracted.

Thus, games are played until the remaining token display 135c indicates "0". Since the remaining token display 135c indicates the number of available tokens, either individual tokens 111 or a package of tokens 113 can be inserted into the slots 114a, 114b during games.

The calculation switch 132 is operated to receive the tokens to be dispensed as the prize. Individual tokens 111 or packages of tokens 113 are returned to the player via the return tray 136 depending on the number of tokens calculated as displayed on the remaining token display 135b. To return the tokens, the number of remaining tokens, displayed by the remaining token display 135b, is divided by the number of the tokens in the token package 113. The number of packages of tokens 113 corresponding to the quotient and individual tokens corresponding to the remainder are returned. The number of tokens is then reset to "0" on the total number display 135a.

The tokens and token packages are counted and checked by an exchange counter. The total number of tokens is then displayed. The packages of tokens 113 can be counted 40 to 50 times faster than the individual tokens which are counted one by one.

The packages of tokens 113 are convenient to buy and to handle during and after the games. The individual tokens 111 in the packages of tokens 113 are seldom handled which means they rarely stain the player's hands or the slot machine. Therefore, it is usually only necessary to grind the loose tokens 111. The grinding cost is about one 40th to one 50th of the cost for grinding all the tokens. Further the system of an amusement parlor is able to be made clearer. The loose tokens can also be ground more carefully and thoroughly.

As shown in FIG. 7, a token 118 which is several times thicker or larger than the single token 111 may also be used in place of several individual tokens 111. The thicker token 118 can be handled more easily than the package of tokens 113. Several thick tokens 118 may be wrapped in a package similar to the package of tokens 113.

The package of tokens 113 may have a magnetically recorded portion instead of the identification code, e.g. as with the bar codes in the machine described previously.

Actual coins may be used in place of the tokens. The number of tokens per package is not limited to 50, and may be set at any number such as 40 or 10.

Packages of tokens containing different numbers of tokens, for example, 50 and 100 units worth of tokens may be used simultaneously.

An amount of money may be displayed instead of the number of unit worth of tokens.

Although the drums are used as the three symbol display means, photoelectric displays such as LED or quartz crystal displays may be also used.

The tokens or token packages may be inserted into one common slot instead of the two separate slots.

The game start switch may be either a push-button or a lever.

When the stop buttons are in operation, the symbol display may be stopped manually at preset times, or automatically at a preset time.

The number of tokens to be dispensed as the prize may be added to the figure displayed on the remaining token display when the token collecting switch or the game start switch is operated.

USEFULNESS OF THE INVENTION

With the slot machine according to the first aspect of this invention, since after tokens have been inserted into the slot machine from the front tray or the token dispenser, a number of tokens that varies during a game can always be displayed on the count display, the player can play a game comfortably with good concentration, only looking at the count display, without worrying about the

tokens themselves. After the end of a game, the player can take out the prize tokens from the front tray or can bring a receipt or a card to the exchange counter for exchange for prizes. Thus the player can operate the slot machine efficiently, while concentrating on the game.

With the slot machine according to the second aspect of this invention, the slot machine is operated by inserting loose tokens or at least one package of tokens. The packages can be inserted in the slot without being unwrapped, thus the player does not need to dispose of the wrapping and the amusement parlor stays clean and tidy.

Claims

1. A slot machine equipped with drums, a token collecting switch, a collected-token counter, a start handle and drum stop switches, wherein said machine includes a count display for displaying a number of tokens inserted and subsequently a diminishing number of tokens counted down as they are used, and a game-over switch.
2. A slot machine according to claim 1, further including a front tray with a hopper for receiving and dispensing tokens.
3. A slot machine according to claim 1, further including a front tray with a hopper, whereby said count display is adapted to count down without dispensing tokens as prizes and the tokens may be dispensed into said front tray by activating said game-over switch.
4. A slot machine according to claim 1, further including a token dispenser operatively connected with said count display in such a manner that the number of tokens is displayed on said count display when a paper currency note or the like is inserted into said token dispenser, and a front tray to which the tokens are to be dispensed.
5. A slot machine according to claim 1, further including a token dispenser operatively connected with said count display in such a manner that the number of tokens is displayed on said count display when a paper currency note or the like is inserted into said token dispenser, and a receipt/card outlet for paying out a receipt or a card, on which the number displayed on said count display is printed or recorded, when said game-over switch is depressed.
6. A slot machine which is to be started by tokens inserted into at least one slot and by a

game start switch to turn, change and stop a plurality of symbols at preset times, wherein the tokens include at least two kinds of tokens, such as individual tokens and a package of tokens worth a certain number of individual tokens, and are checked by identifying units to enable games to be played depending on the number of inserted tokens.

7. A slot machine which is to be started by tokens inserted into at least one slot and a game start switch to turn and change a plurality of symbols and stop the symbols at preset times when a stop switch is switched on, wherein the tokens include at least two kinds of tokens, such as individual tokens and a package of tokens worth a certain number of individual tokens, said slot machine comprising:
 - identifying units for identifying the inserted tokens;
 - a total number memory for totalling and storing the number of the tokens identified by said identifying units;
 - token collecting switches;
 - token number determining means for determining the number of tokens to be collected for each game when said token collecting switches are switched on;
 - a collect token display for displaying the number of tokens to be collected for each game according to the determination of said token number determining means;
 - subtracting means for subtracting the number of tokens to be collected for each game from the number of inserted tokens;
 - a starter for activating said game start switch after the tokens are identified by said identifying units and also after the number of tokens to be collected for each game is determined by said token number determining means;
 - result checking means for checking whether or not various combinations of stopped symbols are any of predetermined prize winning combinations;
 - a result memory for storing the number of tokens to be dispensed as a prize depending on the result of said result checking means;
 - prize selecting means for selecting the number of tokens to be dispensed as a prize according to the prize winning combinations checked by said result checking means and stored in said result memory;
 - a result display for displaying the number of tokens to be dispensed as the prize selected said prize selecting means;
 - an adding device for adding the number of tokens to be dispensed as the prize to the

number of inserted tokens stored in said total number memory; and

a remaining token display for displaying the number of the tokens stored in said total number memory, the number of the tokens subtracted by said subtracting means, and the number of the tokens added by said adding device. 5

8. A slot machine according to claim 7, further including a calculating switch for returning refundable unused tokens and prize dispensing means adapted to give tokens as a prize according to the number of the remaining tokens stored in said total number memory when said calculating switch is switched on. 10 15
9. A slot machine according to claim 6, 7, or 8, wherein the tokens are individual tokens, which are to be inserted into the slot one by one, or a package of tokens worth a plurality of the individual tokens. 20
10. A slot machine according to claim 9, wherein the package of tokens includes individual tokens wrapped in a package with bar codes or a magnetically recorded portion as an identification code. 25
11. A slot machine according to claim 6, 7 or 8, wherein the individual token is a token or a coin, and the package of tokens has tokens or coins different from the individual tokens or coins. 30

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FIG. 1

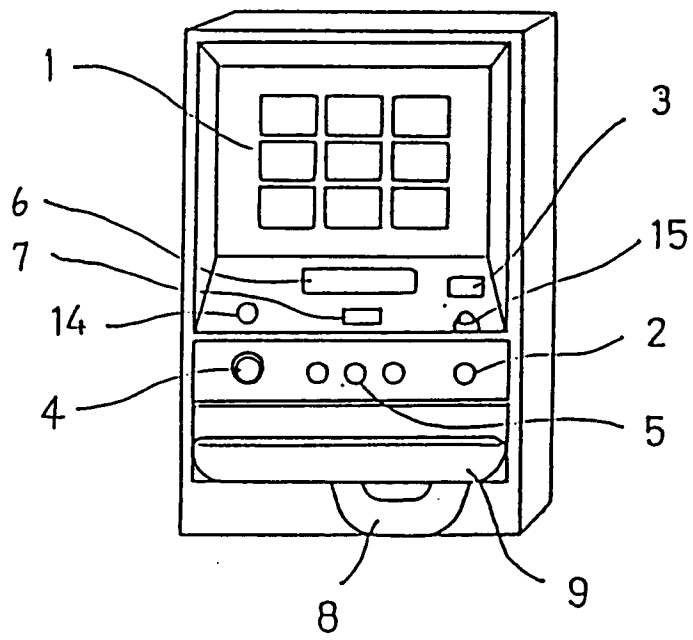


FIG. 2

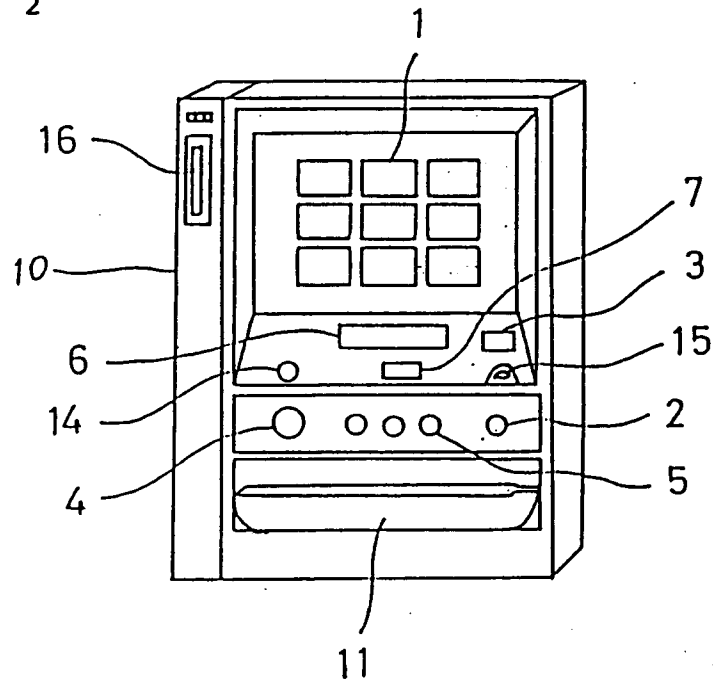


FIG. 3

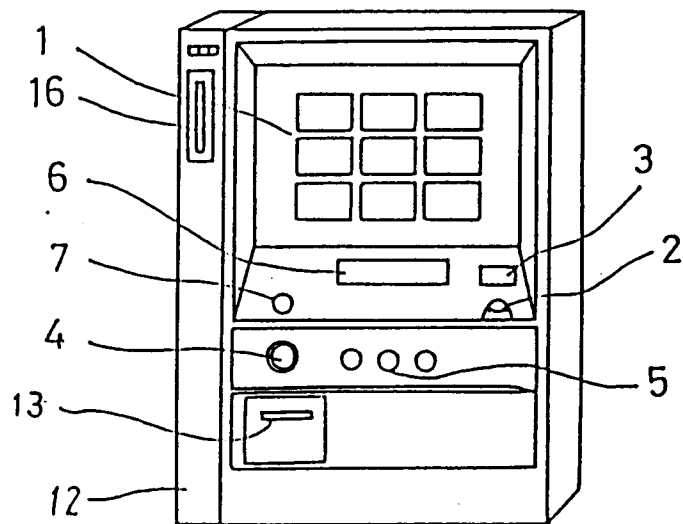


FIG. 4

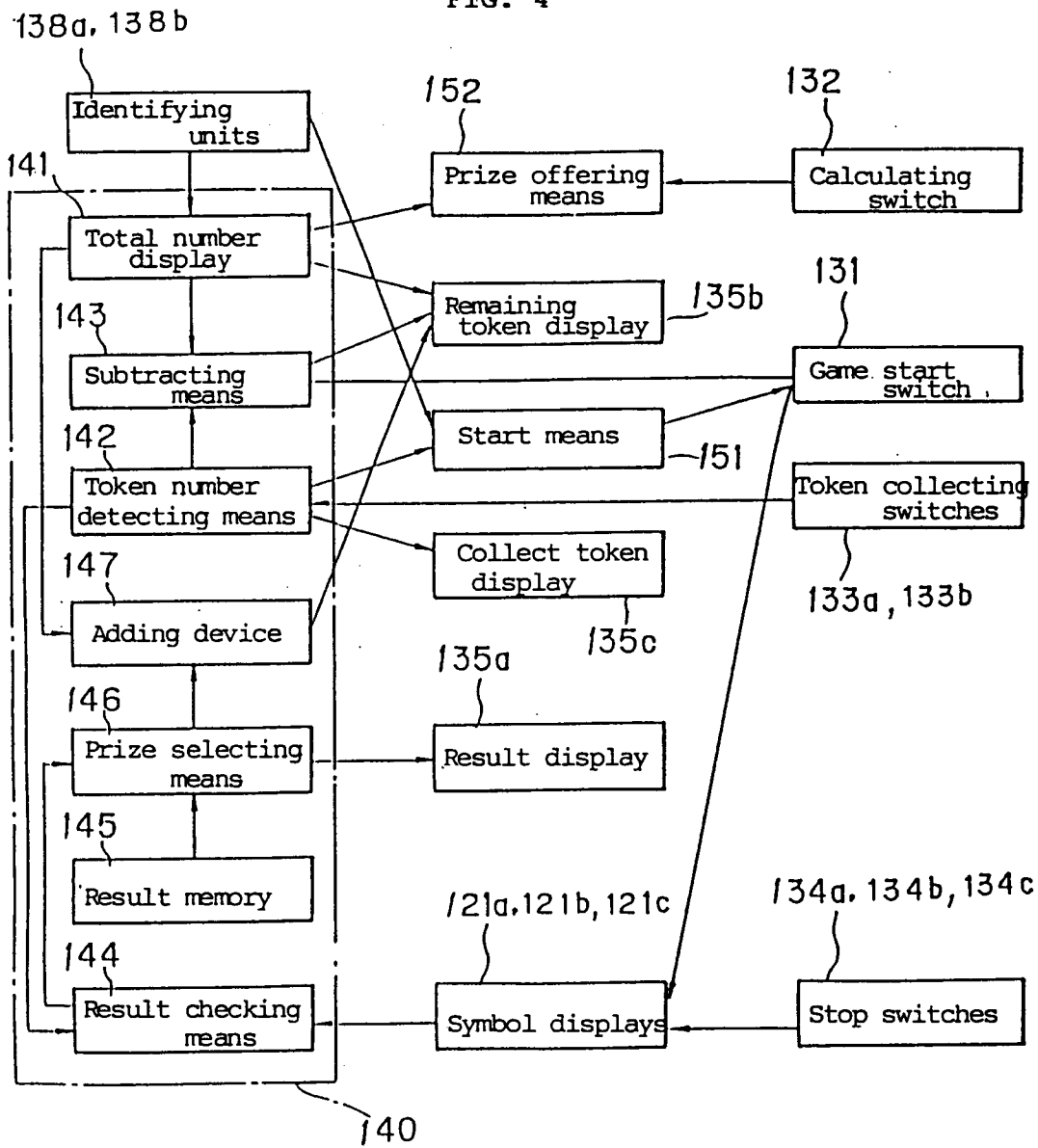


FIG. 5

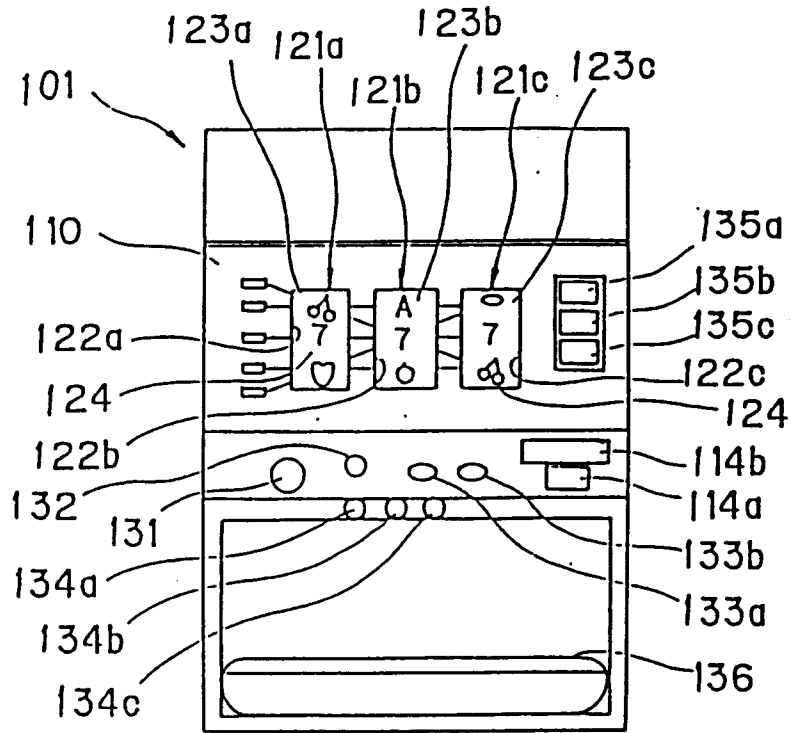


FIG. 6

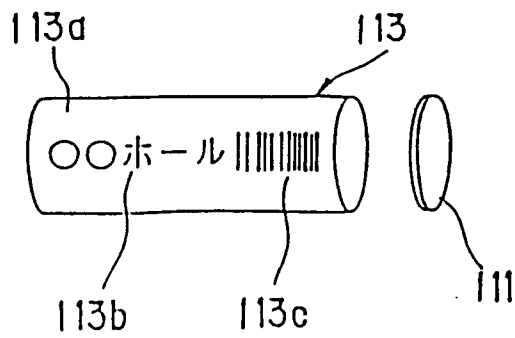
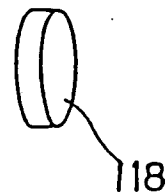


FIG. 7



INTERNATIONAL SEARCH REPORT

International Application No PCT/JP91/01653

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶				
According to International Patent Classification (IPC) or to both National Classification and IPC Int. Cl ⁵ A63F5/04, A63F9/00, A63F7/02, G07D1/00-9/06, G07F7/04, G07F9/02				
II. FIELDS SEARCHED				
Minimum Documentation Searched ⁷				
Classification System	Classification Symbols			
IPC	A63F5/04, A63F9/00, A63F7/02			
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸				
Jitsuyo Shinan Koho	1953 - 1990			
Kokai Jitsuyo Shinan Koho	1971 - 1990			
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹				
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³		
Y	JP, U, 64-19486 (Takasago Denki Sangyo K.K.), January 31, 1989 (31. 01. 89), Figs. 1, 2, 3 (Family: none)	1, 2, 3, 4, 5		
Y	JP, A, 57-3664 (Namihiko Ogasawara), January 9, 1982 (09. 01. 82), (Family: none)	1, 2, 3, 4, 5		
A	JP, A, 63-77480 (Kozo Tsujimoto), April 7, 1988 (07. 04. 88), (Family: none)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11		
<p>¹⁰ Special categories of cited documents:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <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> </td> <td style="width: 50%; border: none;"> <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>"&" document member of the same patent family</p> </td> </tr> </table>			<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>"&" document member of the same patent family</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>"&" 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			
February 24, 1992 (24. 02. 92)	March 3, 1992 (03. 03. 92)			
International Searching Authority	Signature of Authorized Officer			
Japanese Patent Office				