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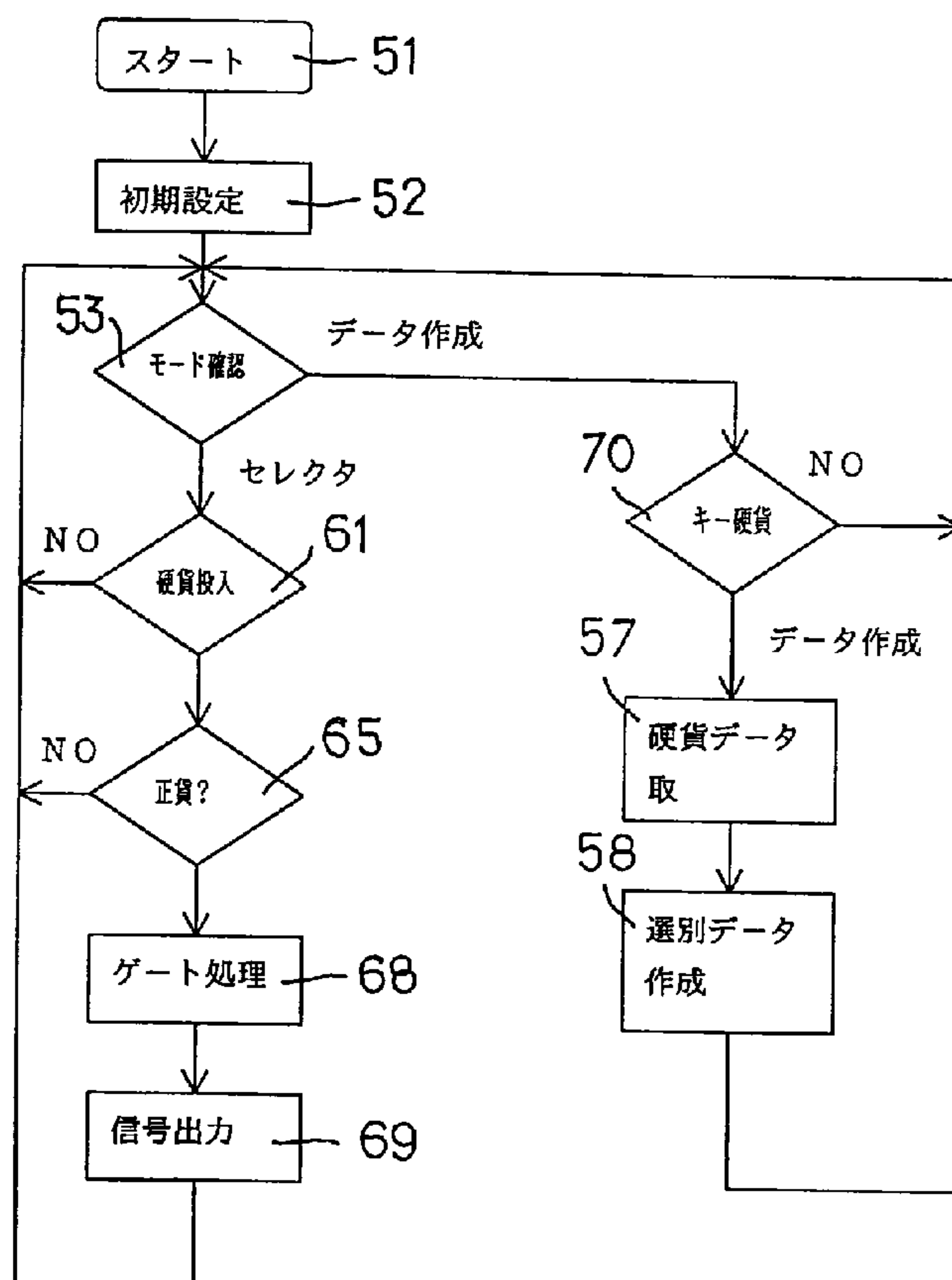
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(54) **SELECTEUR (DE PIÈCES DE MONNAIE) ELECTRONIQUE A
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(54) **KEY TYPE ELECTRONIC COIN SELECTOR**



(57) An electronic coin selector comprises at least means for detecting the inserted coin electronically to obtain data. Means are provided for storing a key data which relate to a key of the inserted coin form. Further means are provided for comparing the inserted coin data and the key data to judge whether the coin is key coin.

ABSTRACT

An electronic coin selector comprises at least means for detecting the inserted coin electronically to obtain data. Means are provided for storing a key data which relate to a key of the inserted coin form. Further means are provided for comparing the inserted coin data and the key data to judge whether the coin is key coin.

KEY TYPE ELECTRONIC COIN SELECTOR

The present invention relates to a coin selector for sorting electronically coins which are currency.

In particular the present invention relates to a coin selector which can change simply and store various data which relate to desired genuine coins.

10 Furthermore, this invention relates to a key type electronic coin selector which can lock the memory of data which relate to genuine coins, concretely.

The term "coin" in this specification is understood to small disc bodies, such as coins which are currency, medals or tokens for games.

Japanese Patent Application No. 9-213789 for which the applicant previously filed an application describes an electronic coin selector. This variety of electronic coin selector can not store simply the various data which relate to desired genuine coin.

20 In other words, an electronic coin selector cannot be simply changed into an other desired genuine coin selector from the set genuine coin selector.

Therefor, the disadvantage of a conventional electronic coin selector as above mentioned can change the set genuine coin data into a desired other genuine coin data simply.

Concretely, the disadvantage of a conventional electronic coin selector can change into genuine coin data by a person except a manager simply.

30 The disadvantage of a conventional electronic coin selector, i.e., security, is not a sufficient warranty of reliability and the safety.

The present invention was developed to eliminate the above mentioned problem.

According to the present invention, there is provided an electronic coin selector comprising at least: means for detecting an inserted coin electronically to obtain data, means

for storing the key data which relate to the key of the inserted coin form, means for comparing the inserted coin data and the key data to judge whether the coin is key coin.

Preferably, the key data may be previously stored in memory means.

The electronic coin selector may further comprise means for storing the coin data which relate to the inserted genuine coin, and means for changing the coin data when the inserted coin is judged to be key coin.

10 Preferred embodiments of the invention will be described below as examples, without limitative manner, having regard to the attached drawings, wherein:

Fig. 1 is a perspective diagram view showing one example according to the present invention.

Fig. 2 is a block circuit diagram built into Fig. 1.

Fig. 3 is a flowchart for explaining the operation of the embodiment of the Fig. 2.

Fig. 4 is a perspective diagram showing another embodiment of the present invention.

20 Fig. 5 is a block circuit diagram built into Fig. 4.

Fig. 6 is a flowchart for explaining the operation of the embodiment of the Fig. 5.

Fig. 7 is a flowchart for explaining another operation of the embodiment of Fig. 5.

The coin selector 20 according to this invention is shown in a schematic manner in Fig. 1.

A selector 20 is slender type box. The top part of a selector 20 provides the insertion opening 11 of coin.

30 The bottom of a selector 20 provides the accommodation opening 12 for receiving genuine coin in the inside of, for example a game machine (not shown).

And, the bottom of a selector 20 provides the return opening 13 for discharging dummy coin etc. besides a game machine.

The fairly large trapezoid board shown in the upper part of Fig. 1 is a door 14.

A door 14 is provided by pivot axis 15 at the right-hand side of Fig. 1, and is usually closed with a spring (not shown).

The trapezoid board shown in Fig. 1 is a cover 16, and is removably fixed to the selector 20.

The horizontal-direction J type lever 18 (not shown) made from resin is pivoted at the nearly central part in the upper part of Fig. 1.

10 In addition, although omitted for details, when a lever 18 is pushed downward, a door 14 is opened and the dummy coin of inside selector 20 is returned by the return opening 13.

When coin is inserted by the selector 20, the operation of a selector is explained simply as follows:

First, the coin into which it is put from the insertion opening 11 performs the natural drop in the diagonal path (not shown) formed inside selector 20.

20 The coin which performs a natural drop is detected by two pairs of coils 21, 22, and 23 (refer Fig. 2) arranged inside of the upper part of a selector 20. This operation judges whether the inserted coin, by means of the circuit shown in Fig. 2, is genuine.

When the coin is judged genuine, ON operating of the solenoid 24 (refer Fig. 2) in the lower-part part inside selector 20 is performed.

When a solenoid 24 operates, the gate for diagonal paths (not shown) opens.

30 Therefore, genuine coin drop through the accommodation opening 12 of a selector 20. The dropped genuine coin is contained in the cash box (not shown) of the genuine coin installed inside the game machine.

At this time, signal S for detecting a coin is output from the sensor 25 (refer Fig. 2) arranged in selector 20 in the near accommodation opening 12.

OFF operating of the solenoid 24 through detecting-signal S is performed, and the gate for diagonal paths closes.

When the inserted coin is judged a dummy coin, the solenoid 24 does not operate. For this reason, the gate for diagonal paths remains closed. The dummy coin drops from the return opening 13 through a underpath (not show).

In other words, dummy coin is discharged out from a game machine.

Fig. 2 is a block diagram of the electronic circuit built in the selector 20 of Fig. 1.

10 The coil 21 for detection detects the material of the inserted coin.

The coil 21 for detection is connected to the oscillation circuit 26 of a comparatively low frequency.

The coil 22 for detection detects the thickness of coin. The coil 22 for detection is connected to the oscillation circuit 27 of a comparatively high frequency.

The coil 23 for detection detects the diameter of the coin. The coil 23 is connected to the oscillation circuit 28 of a comparatively high frequency.

20 Each signal from oscillation circuits 26-28 is rectified by each rectifier circuits 31, 32, and 33 containing detection means.

The reference number 34 of the center in Fig. 2 is a circuit which converts an analog signal to a digital signal.

A converting circuit 34 respectively performs the sampling of the analog signal from each rectifier circuits 31-33, and converts it to a digital signal, and outputs each signal.

The reference number 35 is a signal-processing unit.

30 The signal-processing unit 35 is CPU or a microcomputer concretely, and processes a digital signal.

The reference number 36 is a memory and stores various data.

The memory 36 of an example stores the key data 41 which relate to the coin type key.

The key data 41 are input into the signal-processing unit 35 from an external through an input terminal 37 and are

stored in the memory 36.

The key data 41, in other words, is desirable to store in the memory 36 previously.

The coin type key uses concretely the medal of silver, the medal of gold, a special alloy medal, a magnetic medal, etc.

Furthermore, the memory 36 stores the various coin data 42 which relate to the inserted genuine coin as after-mentioned.

10 The reference number MS of the right-hand-side of center in Fig. 2 is a switch for mode selections.

The switch MS chooses either storing of the coin data 42 in a memory 36 or operating of selector 20.

Switch 500S is for setting the coin data 42 of a coin of 500 yen, and for storing the coin data of a coin of 500 yen.

Similarly, switch 100S is for setting the coin data 42 of a coin of 100 yen, and for storing the coin data of a coin of 100 yen.

20 Switch 50S is for setting the coin data 42 of a coin of 50 yen, and for storing the coin data of a coin of 50 yen. Switch 10S is for setting the coin data 42 of a coin of 10 yen, and for storing the coin data of a coin of 10 yen.

The signal 500 of the right-hand-side upper part of Fig. 2 is output for a game machine etc., when the inserted coin is Genuine coin of 500 yen.

Similarly, a signal 100 is output for a game machine etc., when the inserted coin is Genuine coin of 100 yen.

30 The signal 50 is output for a game machine etc., when the inserted coin is a genuine coin of 50 yen. A signal 10 is output for a game machine etc., when the inserted coin is a genuine coin of 10 yen.

Example I

Fig. 3 is a flowchart for explaining the operation of

Fig. 2.

When the power supply switch (not shown) of the selector 20 is switched ON, the operation starts (step 51). The start of an operation performs, the initialization of the selector 20 is automatically performed (step 52).

As to an initialization, the check of whether the solenoid 24 of a gate operates normally and whether a sensor 25 operates normally concretely is done automatically.

10 Next, the case where a selector 20 is only used for a coin of 100 yen for example, is described.

In this case, first, the selecting switch MS for a mode modification is chosen as data production / memory mode. Next, the coin type setting switch 100S for coins of 100 yen is chosen.

Therefore, if step 52 of the initialization is completed, a data production mode will be chosen by the step 53 of a mode confirmation.

20 In this situation, if the coin type key is inserted into the opening 11 of a selector 20, the data of key coin and the key data 41 of a memory 36 will be compared.

As a result of comparison, when the coin type key is judged to be genuine, a data production mode will be performed. (Step 70). That is, if the coin of 100 yen is inserted into the insertion opening 11 (step 54), the inserted 100 yen coin will count (step 55), and, the sampling data of the inserted coin of 100 yen are obtained (step 56).

30 The above mentioned procedure is repeated until the coin of 100 yen is continuously inserted into the insertion opening 11 and sum-total number of sheets reaches a predetermined number-of-sheets N (from step 57 to step 54).

If the predetermined number-of-sheets N is reached, the coin data 42 of a coin of 100 yen will be statistically processed by the signal-processing unit 35 (step 58). The coin data 42 are stored into the memory 36 (step 59). The electronic coin selector 20 is used to choose the collector mode of the mode modification switch MS after the above-

mentioned preparation.

If the coin is inserted into the insertion opening 11 in the above mentioned situation (step 61), the data of the inserted coin will be obtained by the sampling (step 62).

The sampling data of the inserted coin are compared with the coin data 42 of memory 36 (step 63).

When the sampling data of the coin coincides with the coin data 42 of a coin of 100 yen, it judges that the coin is genuine (step 65).

10 When the coin is judged to be genuine, the solenoid 24 with gate for receiving Genuine coin is switched on (step 66).

The genuine coin passes through the sensor 25 (step 67), the solenoid 24 with gate for receiving genuine coin turns OFF (step 68). The signal 100 of genuine coin shown in Fig. 2 simultaneously is output (step 69). In addition, when signal for genuine coin 100 is output, the game machine which the equipped with the electronic coin selector 20 gets the situation in which a game is possible.

20 The collector shown in Fig. 4 is equipped with almost the same component as the collector of Fig. 1. Therefore, the same part uses the same reference numbers.

The operation in which the coin is inserted into the selector 20 is explained as follows.

30 Coin C introduced from the insertion opening 11 drops naturally in a perpendicular path (not shown) formed inside selector 20. The coin C which performs a natural drop is detected by three coils 21, 22, and 23 (refer Fig. 5) arranged in the upper part of a selector 20. The detected coin C is judged by the block circuit of Fig. 5 to determine whether or not it is genuine. When the coin is judged to be genuine, the solenoid 24 (refer Fig.5) for a gate drive which exists down inside the selector 20 is switched ON. When the solenoid 24 operates, gate GT (refer Fig. 5) of the perpendicular path opens. The genuine coin TC drops perpendicularly and passes along the accommodation opening (not shown) of the selector

20. The genuine coin TC which drop perpendicularly is contained in the cash box (not shown) of the genuine coin installed inside the game machine.

At that time, the signal S of a coin detection is output from the sensor 25 (refer Fig. 5) arranged in the selector 20 near the accommodation opening. The solenoid 24 is turned OFF through the detecting-signal S and gate GT of the perpendicular path is closed.

When the inserted coin is judged to be a dummy coin, the solenoid 24 does not operate. For this reason, the slanting gate GT in the perpendicular path maintains a closing situation. The dummy coin FC drops from a return opening (not shown) through a diagonal path (illustration abridging).

In other words, the dummy coin FC is discharged besides a game machine.

Fig. 5 is a block diagram of the electronic circuit built in the selector 20 of Fig. 4.

The coils 21-23 for a detection respectively detect the material, the thickness and the diameter of the inserted coin. The coils 21-23 for a detection are respectively connected to oscillation circuits 26-28.

Each signal from oscillation circuits 26-28 is rectified, respectively by each rectifier circuits 31-33 through detector circuits D1,D2,D3.

A converting circuit 34 respectively performs the sampling of the analog signal from each rectifier circuits 31-33, and converts it to a digital signal, and outputs each signal.

The signal-processing unit 35 processes a digital signal. A memory 36 stores the key data 41 which relate to the coin type key.

For example, the key data 41 are input into the signal-processing unit 35 from an external, through the input terminal 37 for setting a key coin, and are stored in the memory 36.

The key data 41, in other words, is desirable to be

previously stored in the memory 36. Furthermore, the memory 36 stores the various coin data 42 which relate to the inserted genuine coin as after-mentioned.

The switch MS for selecting mode chooses whether the coin data 42 are either stored in a memory 36 or is performed an operation of selector 20.

Setting means ST of an accepted coin type is a plurality of switches 500S, 100S, 50S, and 10S (not shown) as shown in Fig. 2.

10 As explained in Fig. 2, switch 500S is for setting the coin data 42 of a coin of 500 yen, and for storing the coin data of a coin of 500 yen in the memory 36.

Similarly, switch 100S is for setting the coin data 42 of a coin of 100 yen, and for storing the coin data 42 of a coin of 100 yen. Switch 50S is for setting the coin data 42 of a coin of 50 yen, and for storing the coin data of a coin of 50 yen.

20 The signal 500 of the right-hand-side of center in Fig. 5 is output when the inserted coin is a genuine coin of 500 yen. A signal 100 is output when the inserted coin is a genuine coin of 100 yen.

Similarly, a signal 50 is output when the inserted coin is a genuine coin of 50 yen. A signal 10 is output when the inserted coin is a genuine coin of 10 yen.

Fig. 6 is a flowchart for explaining the operation of Fig. 5. The power supply switch (not shown) of the selector 20 is switched ON, and then the operation starts (step 51).

When the operation starts, the initialization of the selector 20 is automatically performed (step 52).

30 The diagram describes the case where the selector 20 is used to the exclusive use of a coin of 50 yen, for example.

In this case, the mode modification selecting switch MS is chosen as data production/memory mode. The switch for 50 yen of coin type setting means ST (not shown) is chosen.

If step 52 of an initialization is completed, a data production mode is chosen by step 53 of a mode confirmation. In

this situation, if the coin type key is inserted into the insertion opening 11 of selector 20, the data of key coin and the key data 41 of a memory 36 are compared.

As a result of this comparison, when the coin type key is judged to be genuine, a data production mode is executable (step 70). That is, if the coin of 50 yen is inserted into the insertion opening 11, the inserted 50 yen coin will count, and the sampling data of the coin of 50 yen is obtained.

10 This operation is repeated until the coin of 50 yen is continuously inserted into the insertion opening 11 and sum-total number of sheets reaches predetermined number of sheets (step 57).

If the inserted coin reaches predetermined number of sheets, the coin data 42 of a coin of 50 yen is statistically processed by the signal-processing unit 35 (step 58), and the coin data 42 are stored into the memory 36. After the above preparation, the electronic coin selector 20 chooses the grader mode, i.e., selector mode, of the mode modification switch MS and is used the mode.

20

If the coin is inserted into the insertion opening 11 in the above mentioned situation (step 61), the data of the inserted coin is obtained by the sampling.

The sampling data of the inserted coin are compared with the coin data 42 of memory 36.

When the sampling data of the coin coincide with the coin data 42 of the coin of 50 yen, the coin is judged to be genuine (step 65). When coin is judged to be genuine, the solenoid 24 of the gate GT is switched on. And genuine coin TC drops perpendicularly.

30

If the dropping genuine coin TC passes a sensor 25, the solenoid 24 of gate GT is turned Off. It will return to the original situation (step 68).

The signal 50 of genuine coin shown in Fig. 5 is output simultaneously (step 69).

The game machine (illustration abridging) equipped

with the electronic coin selector 20 by the output of the genuine coin is obtained the situation in which a game is possible.

The first example of Fig. 1 and the second example of Fig. 4 explain key-locking functions which respectively relates to the data modification of the genuine coin.

However, the key-locking function of electronic coin selector which uses the coin key according to this invention is not limited to the above mentioned examples.

10 For example, the number data identifications of the selector 20, the accumulation data of the genuine coin, the time data, etc. can respectively be stored in the memory 36.

The accumulation process of the accumulation number of sheets of time data and genuine coin etc. is performed for every output of genuine coin 100 and 50. The result is stored in the memory 36.

20 Furthermore, data can also be obtained only by a coin key being inserted into the selector arranged to the game machine, for example. Consequently, one can investigate immediately from outside what quantity of coin is in the coin cash box inside the game machine.

In other words, the sales sum of each charged game machine can be investigated immediately.

The present invention can be easily changed. For example, the genuine coin data in an electronic coin selector can be changed into the other desired genuine coin, only by inserting key coin by adding a simple component.

30 In other words, no person, except the manager, can change the genuine coin data in an electronic coin selector. Therefore, the security, the reliability, and the safety, etc. of the selector, are greatly improved.

Figure 7 is a flow figure to explain the other operation of Figure 5.

In Figure 7, the case to change registered key data 41 about the coin-shaped key is shown.

In step 71, a program switch, e.g. the mode switching means MS and key coin setting means 37 are turned ON equal to or more than 3 seconds.

In step 72, the orange of LED (not shown) blinks.

In step 73, the program switch, i.e. the mode switching means MS and key coin setting means 37 are made OFF.

In step 70, a registered coin-shaped key is inserted.

In step 74, it is confirmed that the inserted coin is registered on as the coin-shaped key.

10 In step 75, the red and green of LED are alternately blinking.

In step 76, a new coin-shaped key is inserted four times or 16 times.

In step 77, the green of LED is lit up.

In step 78, the data of new coin-shaped key is registered and the change of registration data is completed.

In step 79, a coin sorting-out mode is chosen.

In step 81, it is confirmed that the inserted coin is not registered on as the coin-shaped key.

20 In step 82, the green of LED is lit up.

EXPLANATION OF SYMBOLS

20: Electronic coin selector,

— means for storing key data,

36: memory,

41: key data,

— means for obtaining the data of coin,

30 21, 22, and 23: sensing coil,

26, 27, and 28: oscillation circuit,

31, 32, and 33: rectifier circuit,

34: converting circuit,

35: signal-processing unit,

— means for judging whether it is key coin,
35: signal-processing unit
36: memory, and
41: key data.

Fig. 3 is a flowchart for explaining an operation of Fig. 2.

10 step 51: start,
step 52: initial setting,
step 53: mode confirmation (selection),
step 70: coin-type key inserted,
step 54: coin inserted,
step 55: counting of inserted coin,
step 56: sampling of coin data,
step 57: number of inserted coin $N=n$,
step 58: statistically processing of data,
step 59: data stored in memory,
20 step 61: coin inserted,
step 62: sampling of coin data,
step 63: comparing with data in memory,
step 65: genuine coin?
step 66: accept gate on,
step 67: sensor passed?
step 68: accept gate off, and
step 69: genuine coin signal output.

30

Fig. 6 is a flowchart diagram explaining an operation of Fig. 5.

step 51: start,
step 52: initial setting,
step 53: mode confirmation (selection),

step 61: coin inserted,

step 65: genuine coin?

step 68: gate operation,

step 69: signal output,

step 70: coin-type key?

step 57: coin data collection, and

step 58: processing of data for coin selection.

WHAT IS CLAIMED IS:

1. An electronic coin selector comprising at least:
- means for detecting an inserted coin electronically
to obtain data,
- means for storing a key data which relate to a key
of the inserted coin form,
- means for comparing the inserted coin data and the
10 key data to judge whether the coin is key coin.

2. An electronic coin selector as claimed in claim
1, wherein the key data are previously stored in memory means.

3. An electronic coin selector as claimed in claim
2, further comprising means for storing the coin data which
relate to the inserted genuine coin, and means for changing the
coin data when the inserted coin is judged to be the key coin.

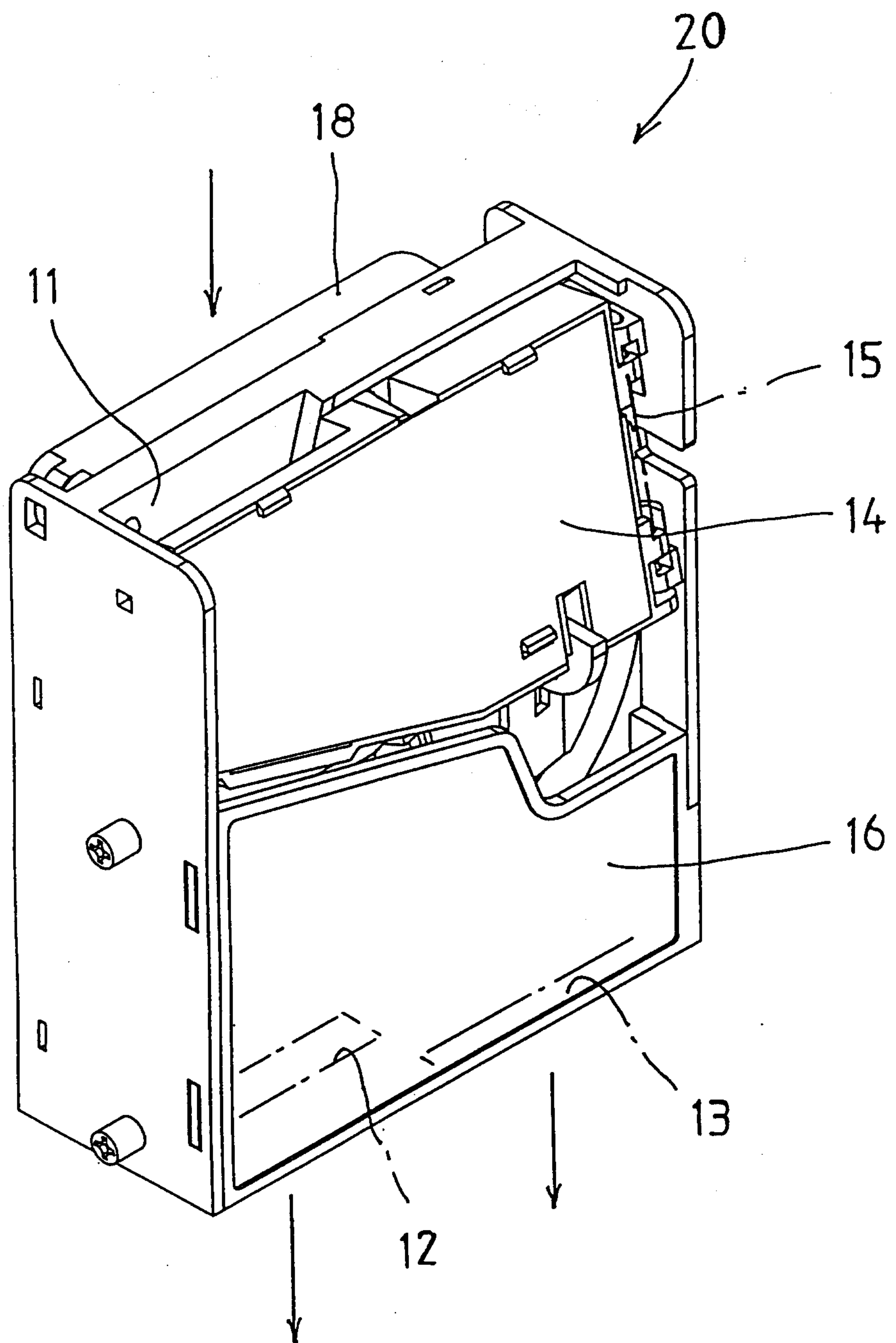


FIG. 1

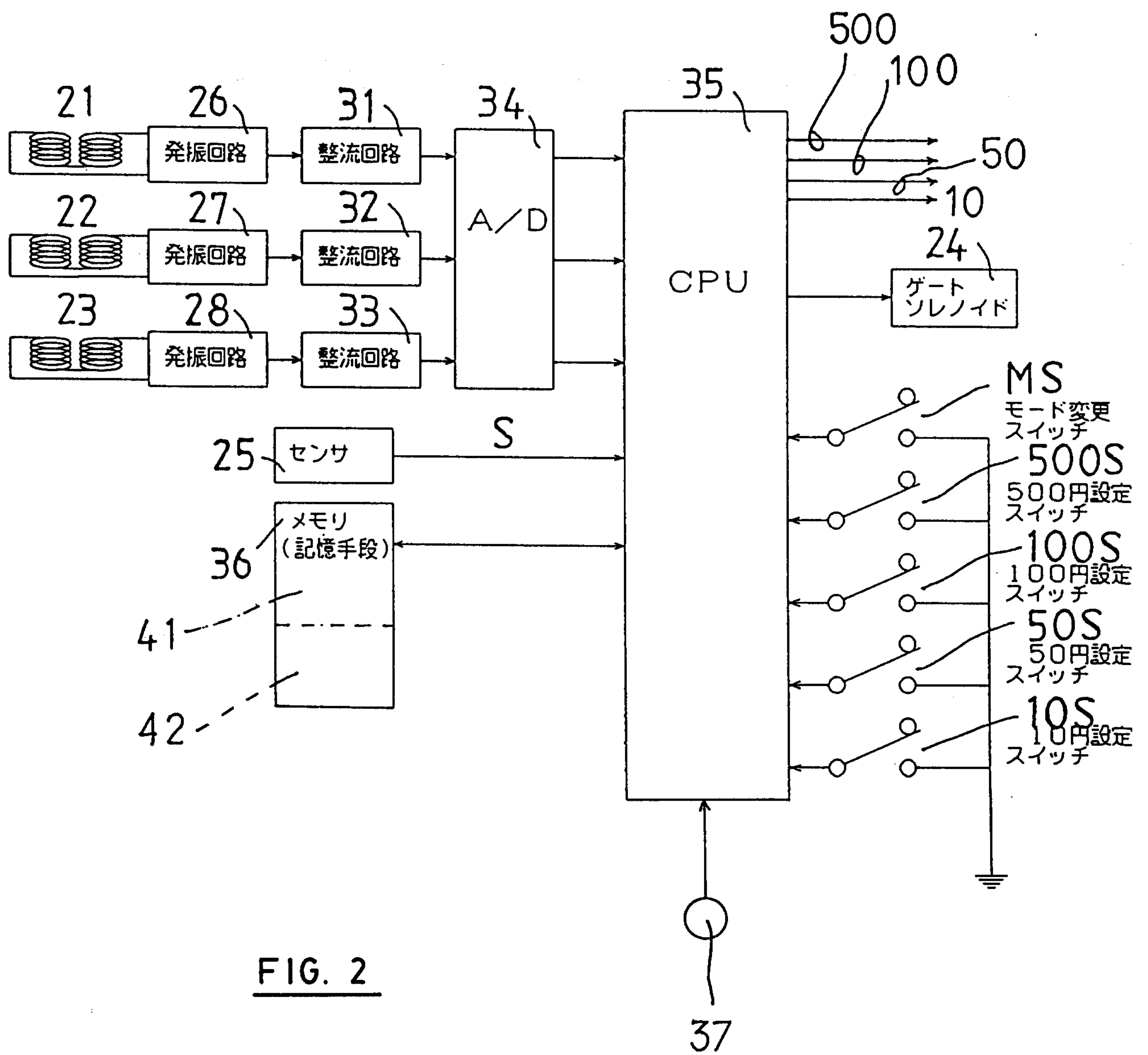


FIG. 2

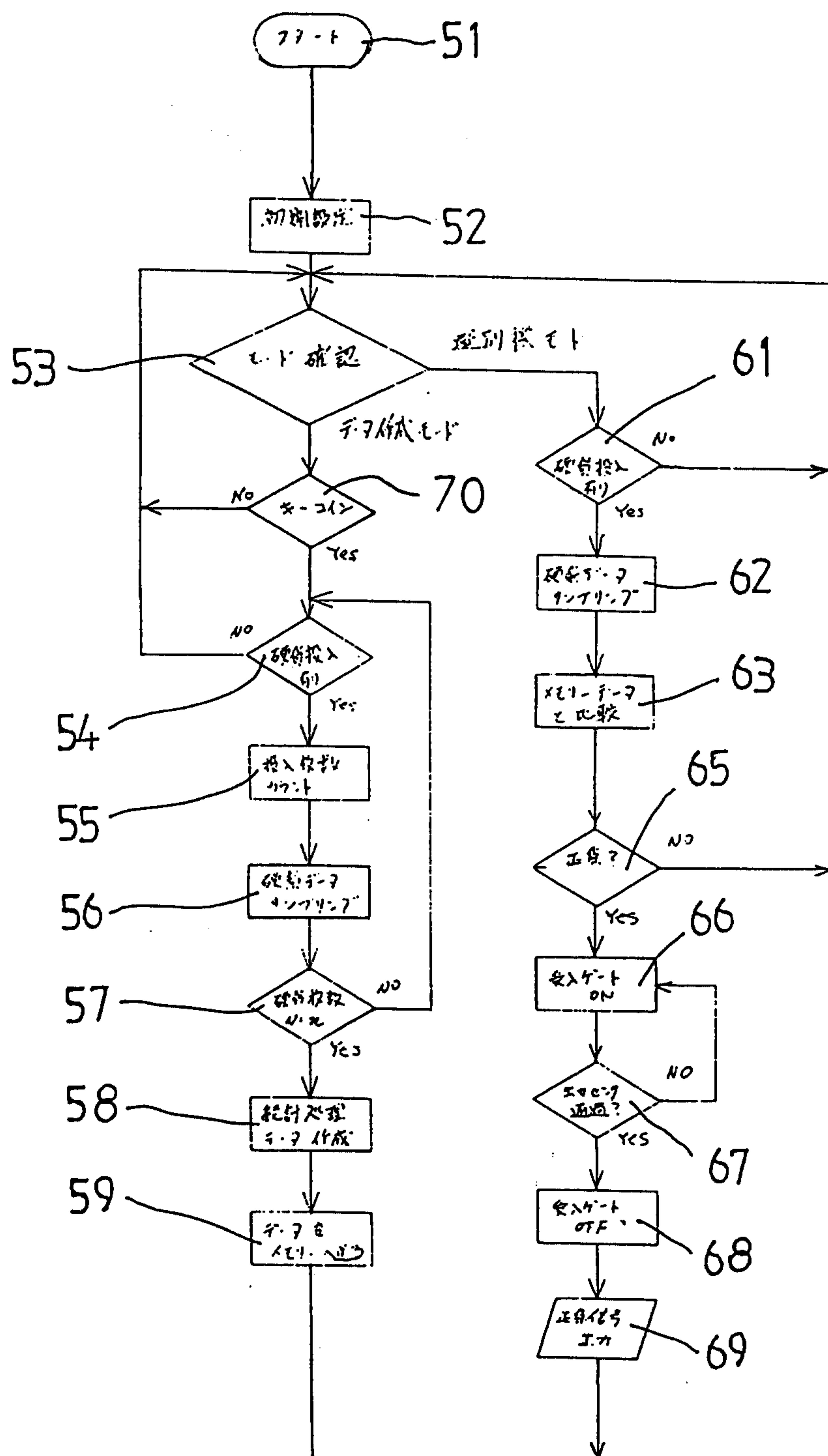


FIG. 3

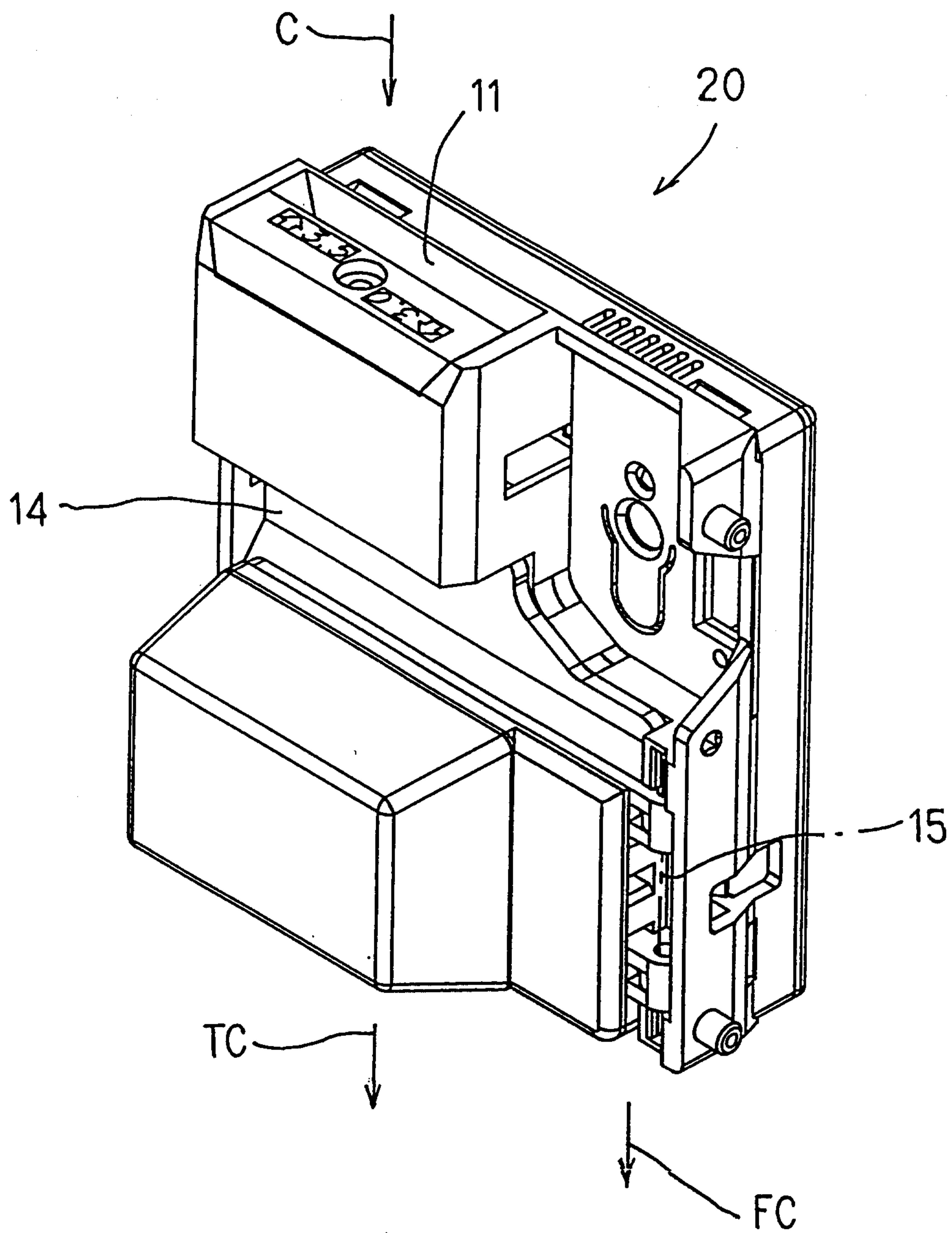


FIG. 4

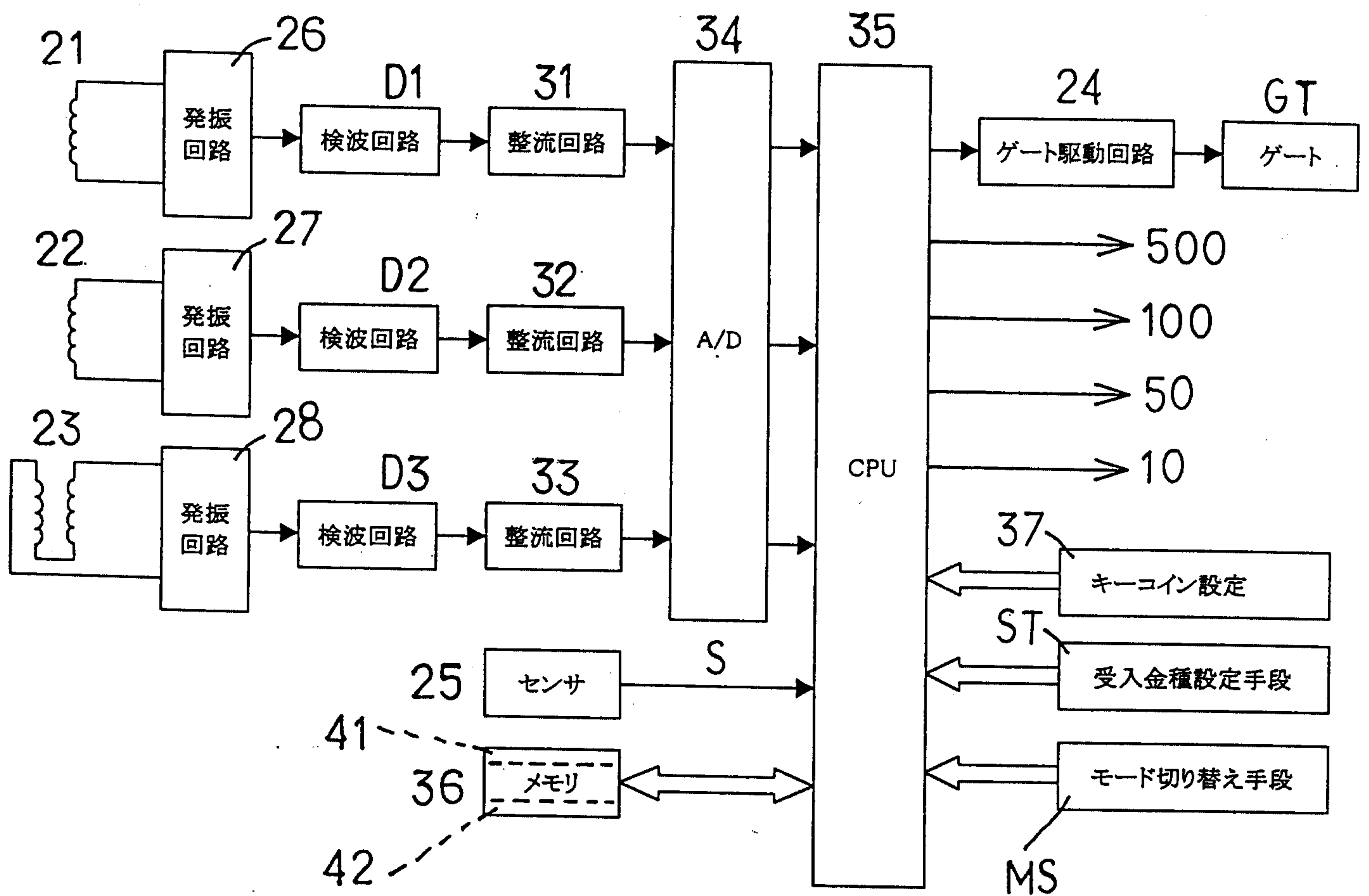


FIG. 5

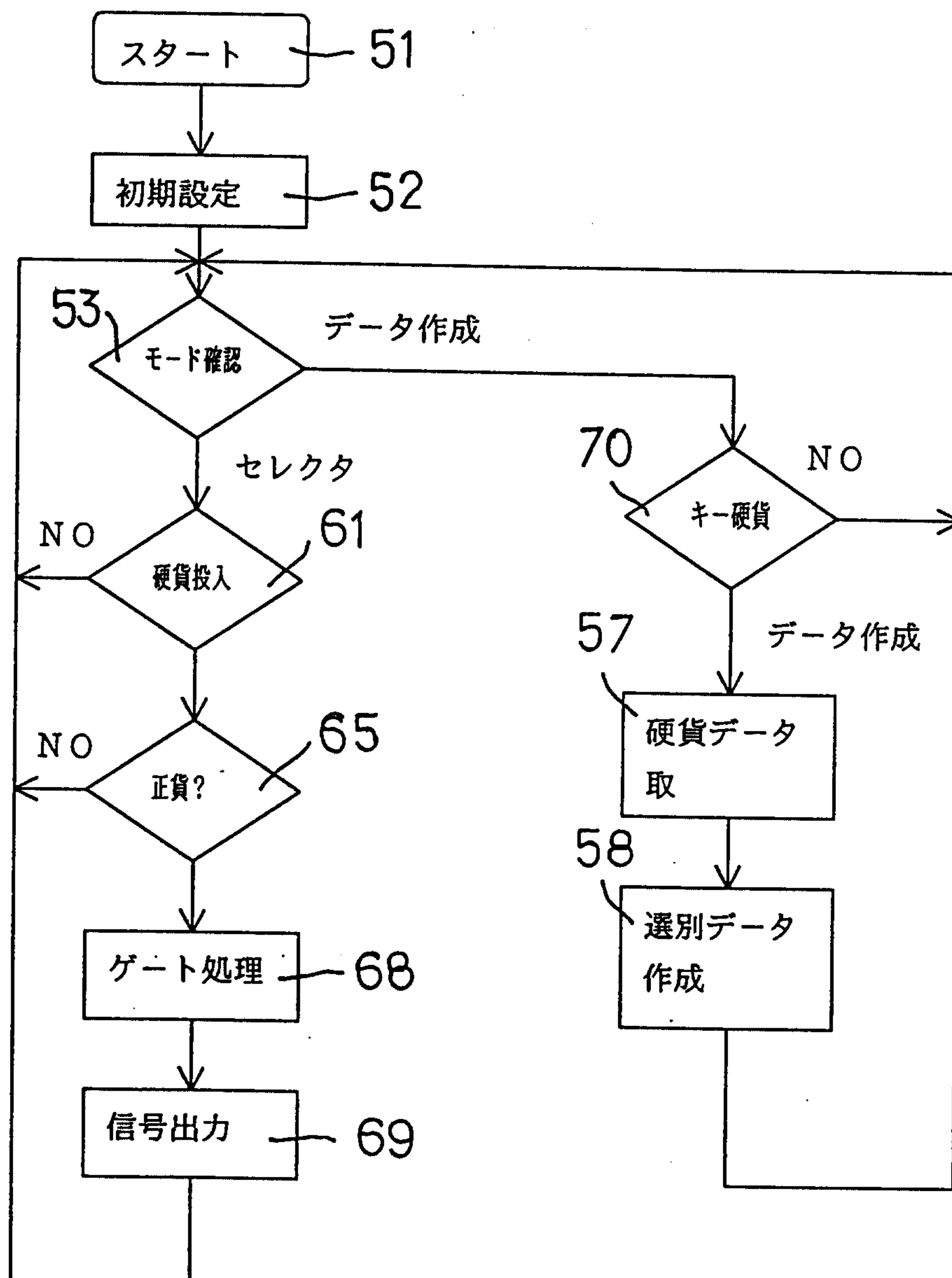


FIG. 6

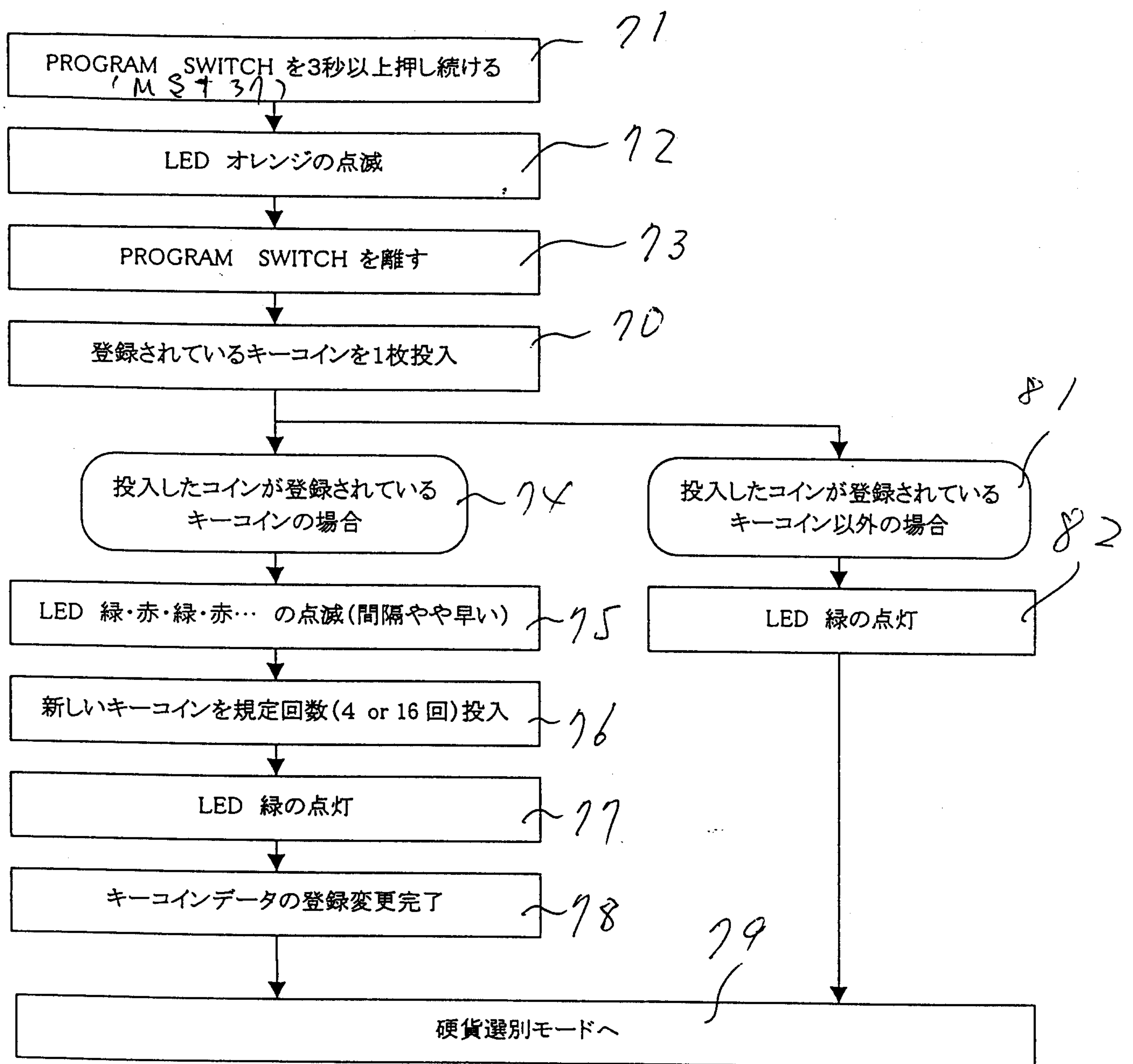


FIG. 7