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(54) **Tag issuance apparatus.**

(57) A tag issuance apparatus includes a printing unit (30) having a printing position, a stepping motor (47) for feeding roll paper (36) to the printing unit (30) and feeding the printed roll paper from the printing position to a downstream side, a cutting device (50), arranged in a downstream of the printing position, for cutting the printed and fed roll paper at a cutting

position to issue a tag (37), a controller for pulling back the leading end portion of the roll paper (36) at the cutting position from the cutting position to the printing position, and dispensing rollers (61A, 61B) for dispensing the cut tag.

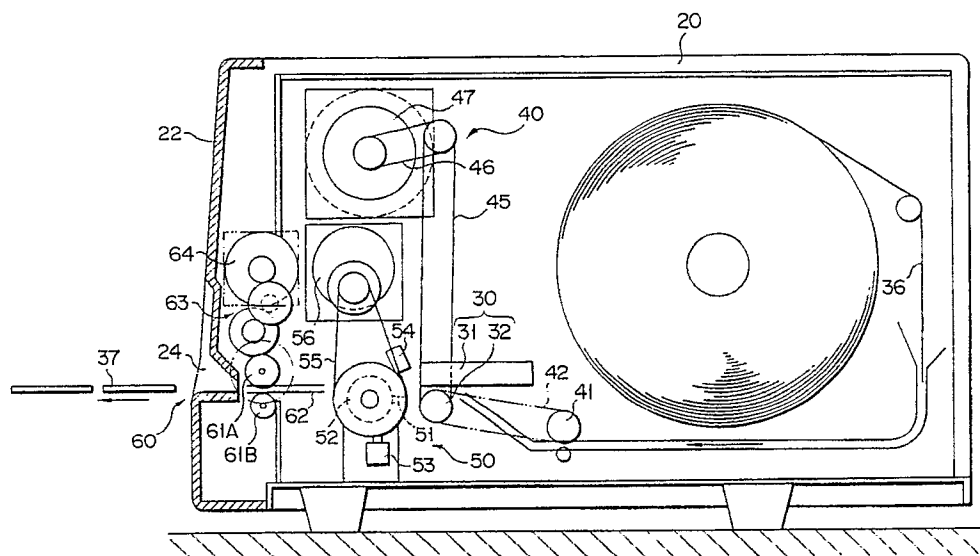


FIG. 2

TAG ISSUANCE APPARATUS

The present invention relates to a tag issuance apparatus.

For example, at an air terminal window, tags having predetermined printed information are attached to baggage to quickly handle baggage.

Fig. 1 shows a conventional tag issuance apparatus. This apparatus comprises a printing mechanism 30 including a printing head 31 and a platen 32. Roll paper 36 is fed to the printing mechanism 30 using a feed roller 67. A tag 37 on which predetermined information such as a destination, a seat number, and the like is printed is dispensed by the feed roller 67 outside the apparatus from a slot 24 formed in a front panel 22. A clerk pulls the leading end of the tag 37 upward (in a Y direction), thereby separating the tag 37 from the roll paper 36 by a blade portion 22A. Thus, the single tag 37 is formed and issued.

In the conventional apparatus, as shown in Fig. 1, a distance L is present between the blade portion (cutting position CP) and a printing position PP, and it is impossible to reduce the distance L to zero. Therefore, when the tag is to be formed and issued, a non-printing portion corresponding to the distance L is always formed on the tag, and as a result, the roll paper 36 is wasted. Furthermore, when tags are successively issued, a clerk must cut tags at the blade portion 22A one by one, and it is difficult to quickly form tags.

It is an object of the present invention to provide a tag issuance apparatus which can facilitate quick formation of tags without wasting roll paper.

This invention can be more fully understood from the following detailed description when taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a schematic view of a conventional tag issuance apparatus;

Fig. 2 is a side sectional view showing an embodiment of a tag issuance apparatus according to the present invention;

Fig. 3A is an enlarged side view of a dispensing roller portion shown in Fig. 2;

Fig. 3B is an enlarged side view showing a modification of the dispensing roller portion shown in Fig. 2;

Fig. 4 is a perspective view showing the overall appearance of the tag issuance apparatus according to the present invention;

Fig. 5 is a block diagram showing an arrangement of a controller;

Fig. 6 is a flow chart for explaining an operation; and

Figs. 7A to 7C are views for explaining states of a tag when the tag is dispensed.

An embodiment of the present invention will be described below with reference to the accompanying drawings.

Figs. 2 to 5 show a tag issuance apparatus according to the present invention. A tag issued by this apparatus is mainly subjected to baggage handling in an air terminal. This apparatus comprises a printing mechanism 30, a print feed mechanism 40, a cutting mechanism 50, a dispensing feed mechanism 60, and a controller 70 comprising a control means in its casing 20. The printing mechanism 30 is disposed between the print feed mechanism 40 and the cutting mechanism 50.

The above constituting elements will be described in detail below.

The tag issuance apparatus according to the present invention has an outer appearance shown in Fig. 4. A side door 23 is formed in the side surface of the casing 20. Roll paper 36 can be set in the casing 20, as shown in Fig. 2, upon opening/closing the door 23.

A power switch 25, a plurality of operation key switches 26, an operation state checking LED 27, a lamp 28, and the like are arranged on a front panel 22. A slot 24 for dispensing a tag 37 is formed in the lower right portion of the front panel 22. The slot 24 is formed to hold the tag 37 so that the leading end portion of the tag 37 projects outside the slot 24. A clerk can easily pull out the tag 37. When tags are successively issued, a tag tray (not shown) for receiving the successively issued tags may be arranged in front of the slot 24.

The printing mechanism 30 comprises a thermal printer having a printing head 31 and a platen 32 which are arranged to oppose each other. Roll paper or elongate sheet 36 is continuously or intermittently fed to the printing mechanism 30 by the print feed mechanism 40.

The print feed mechanism 40 comprises a stepping motor 47 constituting a drive source for quantitatively feeding the elongate paper 36, timing belts 46, 45, and 42, and a feed roller 41 rotated through these timing belts and the platen 32. Since the platen 32 and the feed roller 41 are rotated at the same speed by the timing belt 42, the roll paper 36 can be quantitatively fed in a stable state. As a result, high-precision, clear printing is allowed.

The cutting mechanism 50 is of a rotary driven type in this embodiment although the present invention is not limited to this, and a cutter 51 is helically wound around a cutter drive member 52 having a circular cross section. The leading end portion of the roll paper 36 is always automatically cut at a predetermined position (cutting position CP) upon cooperation of the cutter 51 and a cutter

base 54. The cutter 51 is rotated once by a rotating DC motor 56 through a timing belt 55, when a solenoid 53 is turned on. In this manner, since the cutting mechanism is arranged as a rotary driven type automatic cutting mechanism, the roll paper can be precisely and smoothly cut to form a tag.

The dispensing feed mechanism 60 comprises a pair of dispensing rollers 61A and 61B, a gear train 63 meshing with these rollers, a DC motor 64 for driving the gear train, and a guide 62 for guiding the tag 37 toward the dispensing rollers 61A and 61B. The dispensing rollers 61A and 61B are rotated to quickly dispense the tag 37 fed from the cutting mechanism 50 toward the slot 24. In the preferred embodiment both rollers 61A, 61B are driven. Alternately, only one roller may be rotated.

The dispensing rollers 61A and 61B are spaced apart from each other to have a gap as a distance corresponding to a thickness t of the tag 37 (or more specifically, a distance slightly smaller than the thickness t). Such an arrangement is adopted for the following reason. First, even when a feed speed of the stepping motor 47 for quantitatively feeding the roll paper becomes different from that of the DC motor 64 for dispensing the tag at high speed, the dispensing rollers 61A and 61B are allowed to be idled so as to prevent the tag 37 from being torn or a paper jam. Second, when the trailing end of the tag 37 is undesirably clamped by the printing mechanism 30, the cutting mechanism 50, or the like, the dispensing rollers 61A and 61B are idled to prevent an overload on the DC motor 64, thereby preventing heat generation and damage. Third, when single tag is to be issued, the trailing end portion of the tag 37 is clamped between the rollers 61A and 61B. That is, the tag is held while its leading end projects from the slot 24, so that a clerk can easily pull out this tag.

Fig. 3B shows a modification wherein a guide member 61C is arranged in place of the dispensing roller 61A. When the guide member is arranged in place of one dispensing roller, the same effect can be obtained as in a case wherein the pair of dispensing rollers are arranged.

The controller 70 comprises a CPU 71, a ROM 72, a RAM 73, an I/O port 74, and the like, and controls the entire tag issuance apparatus. The ROM 72 stores a program shown in Fig. 6.

The CPU 71 and the ROM 72 constitute a pull-back control means for pulling back the leading end portion of the roll paper 36, after the tag 37 is formed, from the cutting position CP to a printing position PP, as shown in Figs. 7A and 7B (step 9 in Fig. 6). Since a drive source for pulling back the roll paper 36 is the stepping motor 47, a pull-back operation can be precisely and quickly performed. The ROM 72 stores the following program. When a continuous printing (successive tag issuance) op-

eration is performed, the dispensing rollers 61A and 61B are continuously driven (step 7). When a single printing (single tag issuance) operation is performed, the rollers 61A and 61B are slightly driven so that the trailing end portion of the tag 37 is clamped between the two rollers 61A and 61B, and the leading end of the tag projects from the slot 24 and thus casing 20 (step 8).

The controller 70 is connected to the printing head 31, the stepping motor 47 (driver 48), the DC motor 56 (driver 57), the solenoid 53, the DC motor 64 (driver 65), and the like as objects to be controlled through the I/O port 74. Information such as a destination, a flight number, and the like to be printed on the tag 37 is put from the key switches 26, and is stored in the RAM 73.

The operation of the tag issuance apparatus of the present invention will be described below.

First, the power switch 25 is turned on, and information to be printed is input from the key switches 26.

(1) When a tag successive issuance mode is instructed by the key switch 26:

The controller 70 drives the stepping motor 47 constituting the print feed mechanism 40 to rotate the feed roller 41, thereby feeding the roll paper 36 and rotating the platen 32. At the same time, the controller controls the printing head 31 to print predetermined information (steps 1 to 3 in Fig. 6). Bar code sections for storing information indicated by areas B1 and B2, and character sections indicated by areas C1 and C2 are printed on the roll paper 36 (tag 37). The printed tag 37 (in this state, it is still the leading end portion of the roll paper 36) is stopped in a state shown in Fig. 7A. More specifically, a portion 37A to be cut of the roll paper 36 is stopped at the cutting position CP.

When the cutting mechanism 50 is driven (step 4) and the printed roll paper 36 is completely cut (step 5), since YES is determined in step 6, the dispensing rollers 61A and 61B are continuously driven. As a result, the printed tag 37 is dispensed from the slot 24 at high speed. As for the second and subsequent tags, the leading end portion of each tag is located between the rollers 61A and 61B, and its trailing end portion is not cut yet. In this case, the rollers 61A and 61B are idled due to their interval t . Therefore, the tags can be prevented from being torn, or even if the two motors 47 and 64 suffer from a drive speed difference, the tags will not be jammed.

The tag 37 is dispensed to the slot 24 at a speed $V1$, as shown in Fig. 7B, and at the same time, the leading end portion of the roll paper 36 is pulled back by the distance L from the cutting position CP to the printing position PP at a speed $V2$. The pull-back control means (CPU 71, ROM 72) drives the stepping motor 47 in a reverse

direction (steps 9 and 10), thus attaining the above operation. If no stop command is input, the flow returns to step 1 (step 11), and the printing operation is immediately started to form the second and subsequent tags 37.

(2) When a single tag issuance mode is instructed by the key switch 26:

In the single tag issuance mode, steps 1 to 5, 9, and 10 are executed in the same manner as in the tag successive issuance mode. However, since NO is determined in step 6, the dispensing rollers 61A and 61B are slightly moved in step 8. In this case, the DC motor 64 is controlled so that the trailing end of the tag 37 is stopped at a position separated from the cutting position CP by a distance ℓ . In this state, the trailing end portion of the printed tag 37 is clamped between the two rollers 61A and 61B, and its leading end portion projects from the slot 24.

As described above, in the tag issuance apparatus of the present invention, since a blank leading end portion of the roll paper 36 is automatically and quantitatively pulled back from the cutting position CP to the printing position PP by the pull-back control means (CPU 71, ROM 72), the roll paper 36 will not be wasted. Furthermore, the printed tag is automatically cut by the cutting mechanism 50, and is automatically dispensed at high speed to the outside of the casing by the dispensing means such as rollers 61A and 61B. Therefore, quick formation of tags can be facilitated.

Claims

1. A tag issuance apparatus comprising: a casing (20);
printing means, arranged in said casing (20), for performing printing an elongate paper at a printing position, and
print feed means (40) for feeding the elongate paper (36) to said printing means (30), and feeding the printed elongate paper (36) from the printing position to a downstream side, characterized by further comprising
cutting means, arranged in the downstream side of the printing position, for cutting the part of the elongate paper (36) which is printed by said printing means (30), to form a tag (37);
pull-back control means (70) for reverse-controlling said print feed means (40) so that a leading end portion of the elongate paper (36) is pulled back to the printing position after the tag (37) is formed; and
dispensing feed means (60) for dispensing the tag (37) outside said casing (20).
2. An apparatus according to claim 1, characterized in that said printing means (30) includes a platen

(32), and said print feed means (40) includes:
a feed roller (41) for feeding the elongate paper (36) to the platen (32); and

a stepping motor (47) for synchronously driving said feed roller (41) and said platen (32).

3. An apparatus according to claim 2, characterized in that said pull-back control means (70) reverse-controls said stepping motor (47).

4. An apparatus according to claim 1, characterized in that said dispensing feed means (60) comprises tag dispensing means and a DC motor (64) for driving said tag dispensing means, said DC motor (64) selectively driving said tag dispensing means continuously or slightly.

5. An apparatus according to claim 4, characterized in that said tag dispensing means comprises a pair of dispensing rollers (61A, 61B), said dispensing rollers being arranged to be separated by a distance slightly smaller than a thickness of the elongate paper (36).

6. An apparatus according to claim 4, characterized in that said tag dispensing means comprises a guide member (61C) and a dispensing roller (61B), said guide member (61C) and said dispensing roller (61B) being arranged to be separated by a distance slightly smaller than a thickness of the elongate paper (36).

7. An apparatus according to claim 1, characterized in that said cutting means comprises a rotary driven type cutting mechanism.

8. A tag issuance apparatus comprising:

a printing head (31);

a platen (32) opposing said printing head (31) thereby defining a printing position therebetween, and a feed roller (41) for feeding elongate paper (36) to said printing position,

characterized by further comprising
drive means (47) for synchronously driving said platen (32) and said feed roller (41) to feed the printed elongate paper from the printing position to a downstream side;

cutting means, arranged in the downstream side of the printing position, for cutting the printed elongate paper (36) fed from said printing position at a cutting position to issue a tag (37); and

pull-back control means (70) for pulling back a leading end portion of the elongate paper (36) at the cutting position from the cutting position to the printing position.

9. An apparatus according to claim 8, characterized in that said pull-back control means (70) reverse-controls said drive means (47).

10. A tag issuance apparatus comprising:

a printing unit (30) having a printing position and print feed means (40) for feeding the elongate paper (36) to said printing unit (30) and feeding the printed elongate paper from the printing position to a downstream side, characterized by further com-

prising

cutting means (50), arranged in the downstream side of the printing position, for cutting the printed and fed elongate paper at a cutting position to issue a tag (37); and

pull-back means (70) for pulling back a leading end portion of the elongate paper (36) at the cutting position from the cutting position to the printing position.

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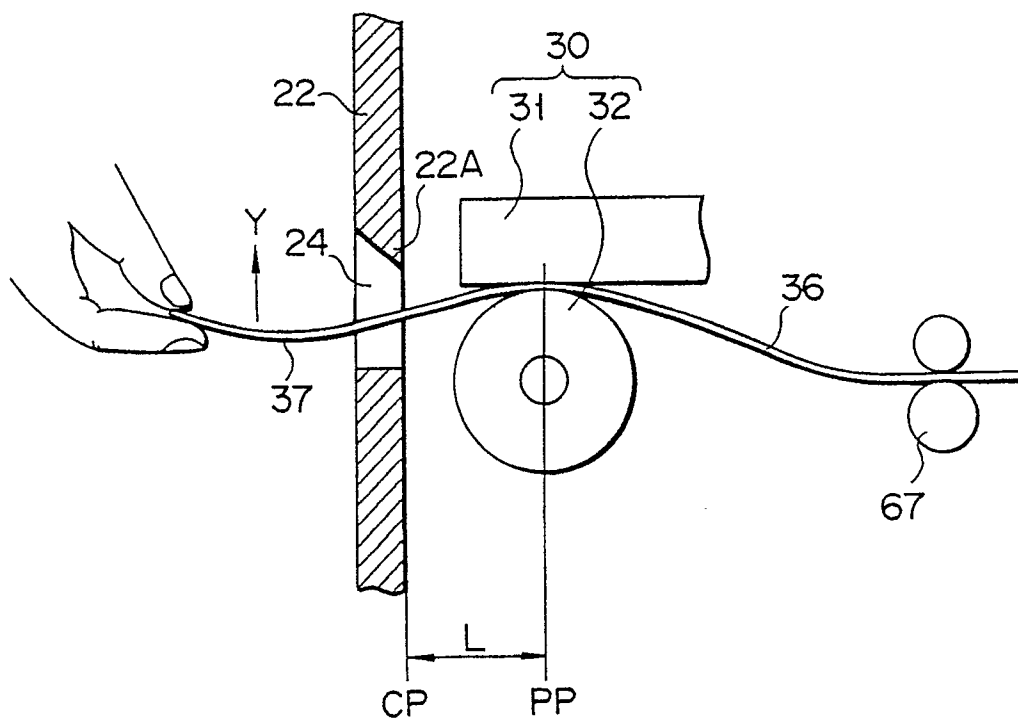


FIG. 1

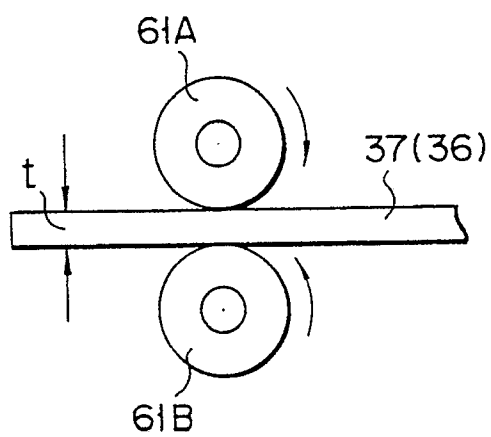


FIG. 3A

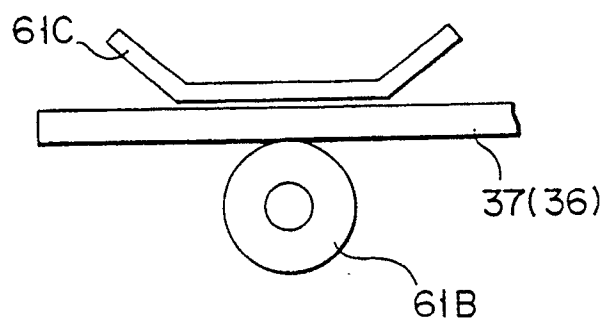


FIG. 3B

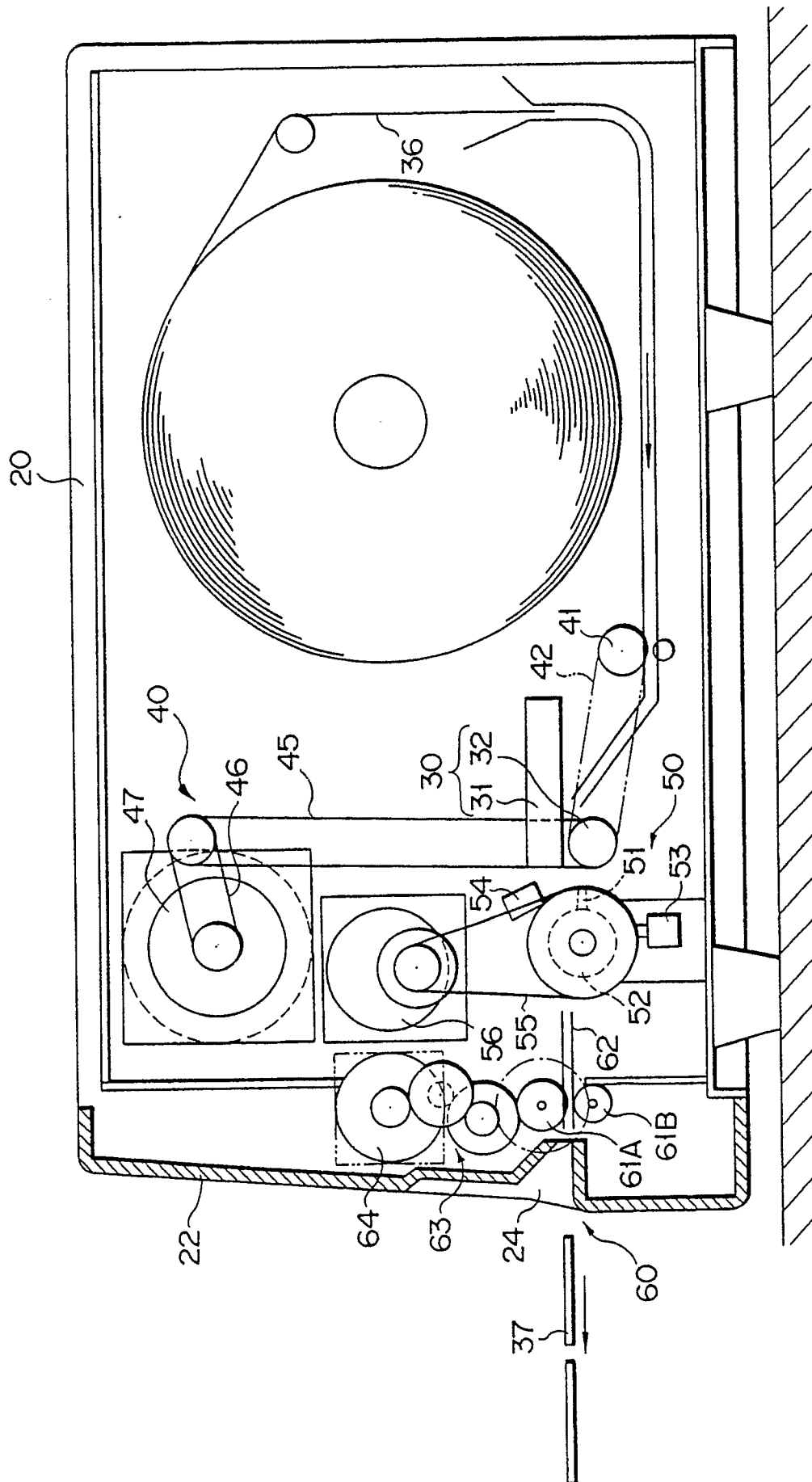
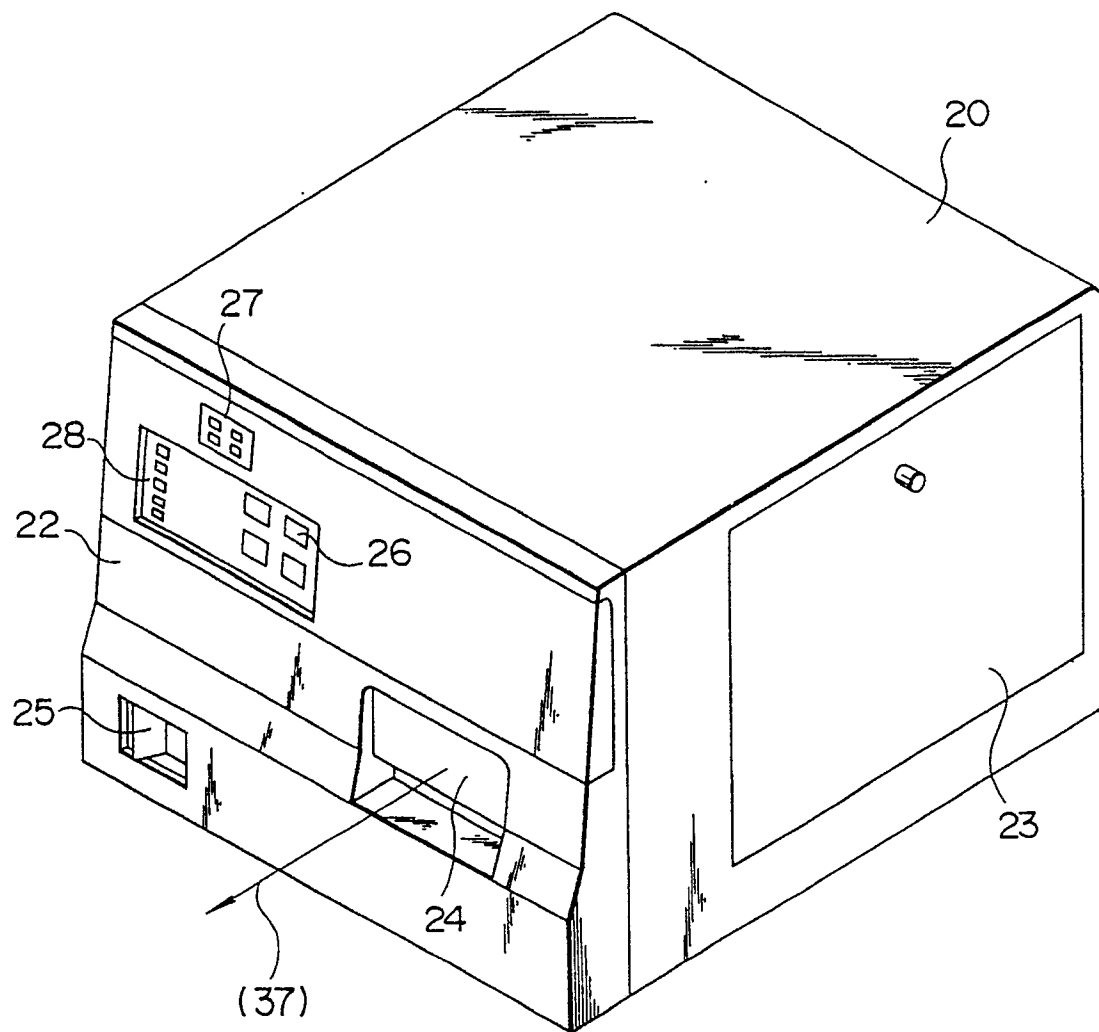


FIG. 2



F I G. 4

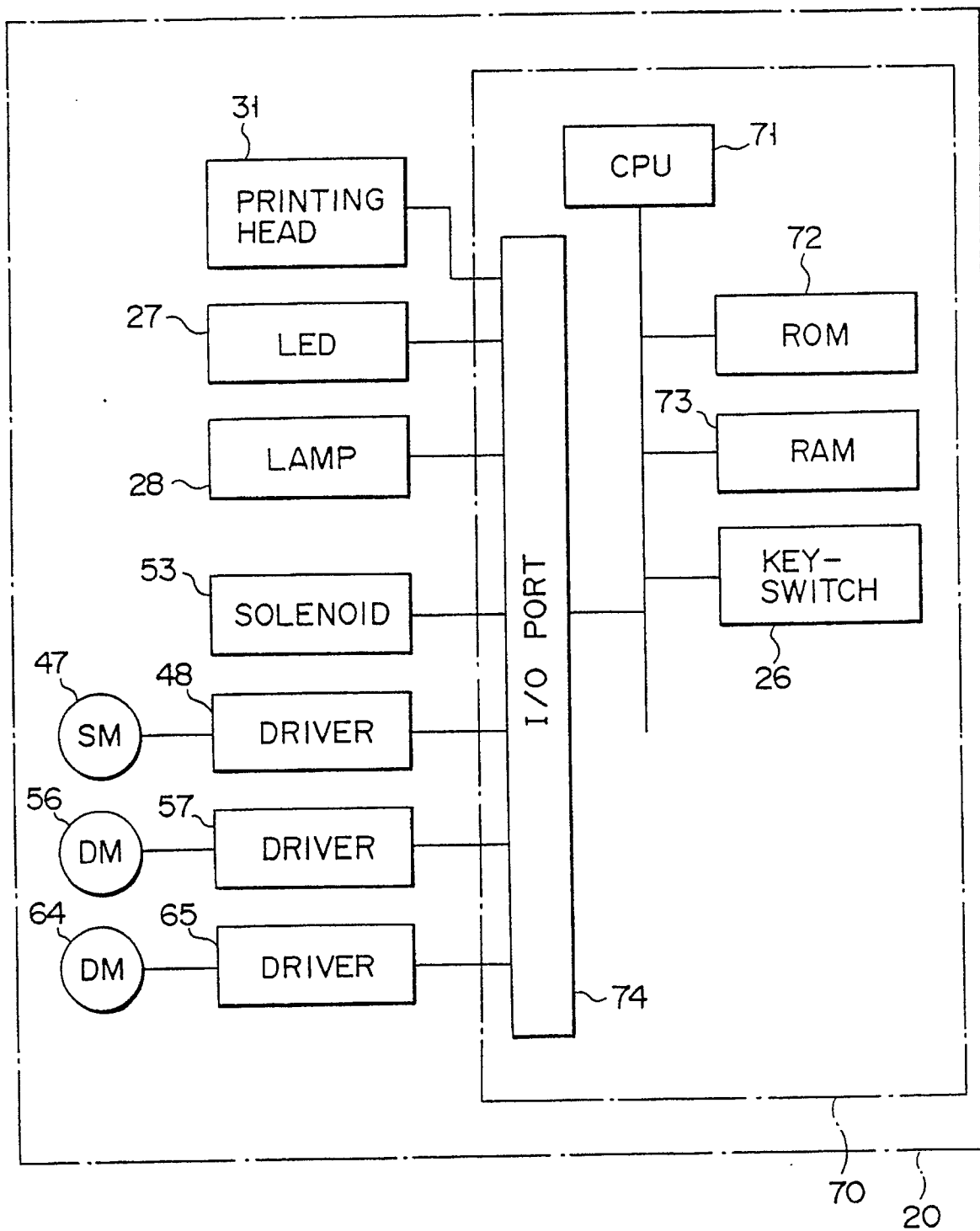


FIG. 5

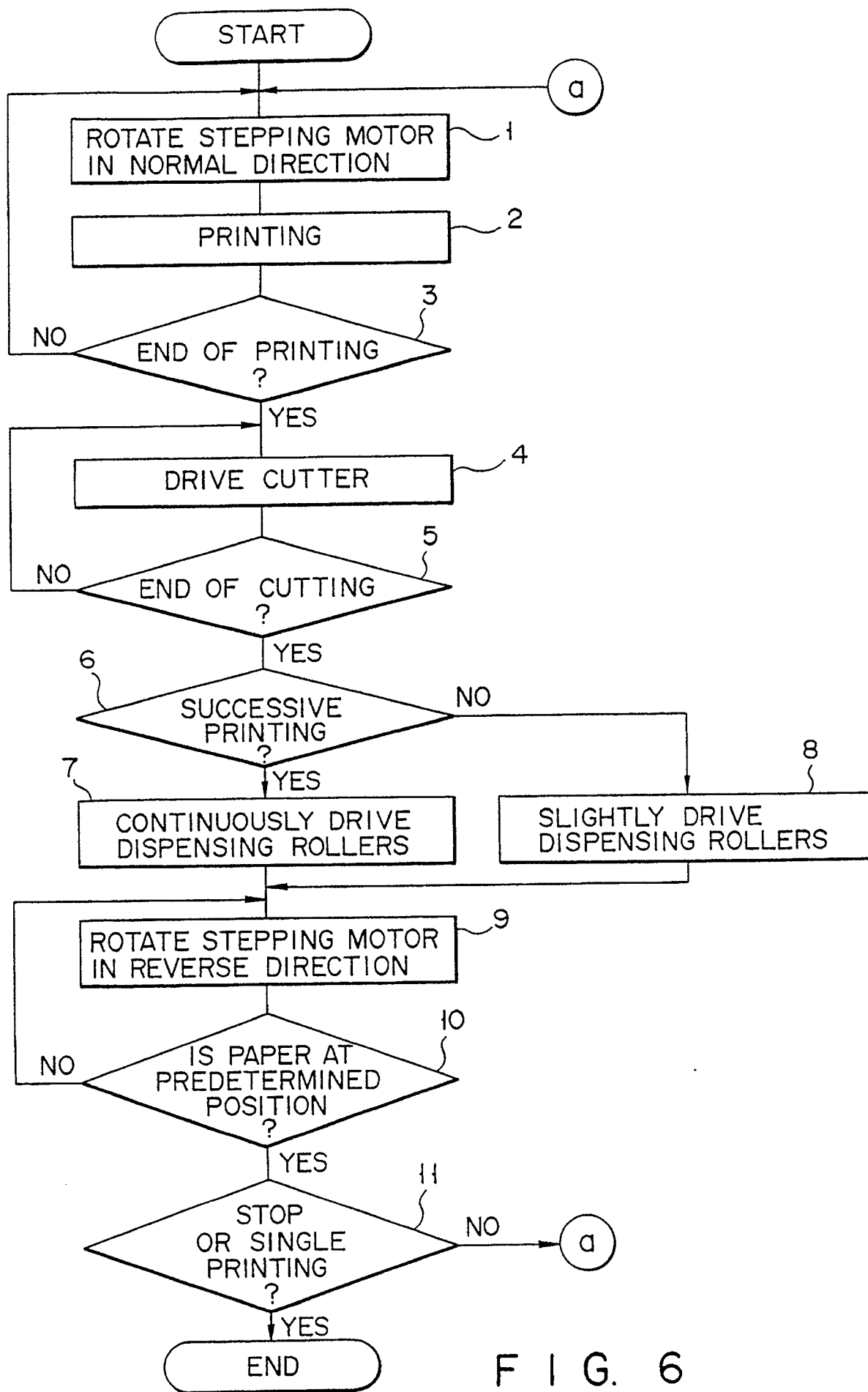


FIG. 6

