

April 29, 1969

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3,440,940

TICKET ISSUING APPARATUS

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Sheet 1 of 2

Fig. 4

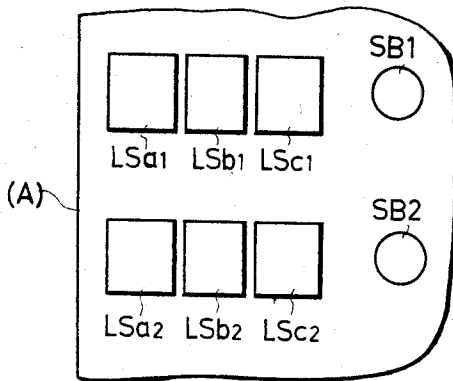


Fig. 3

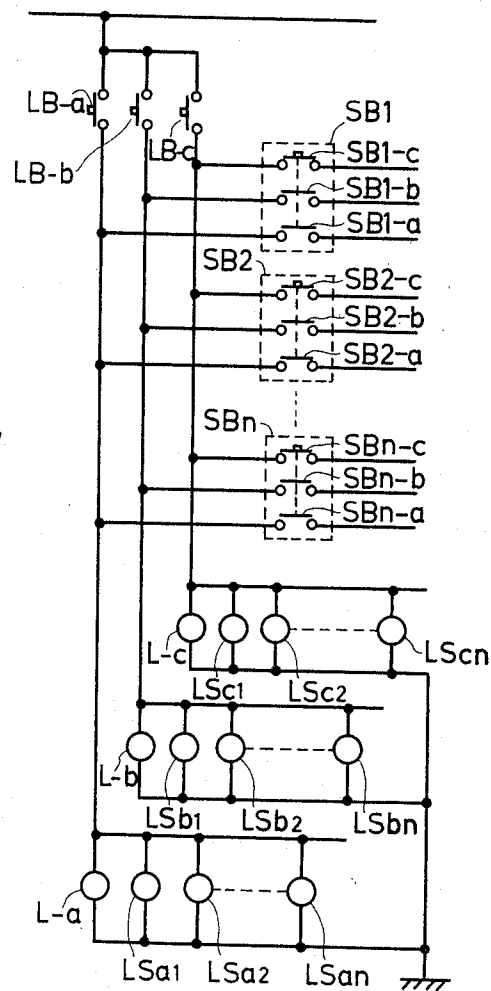
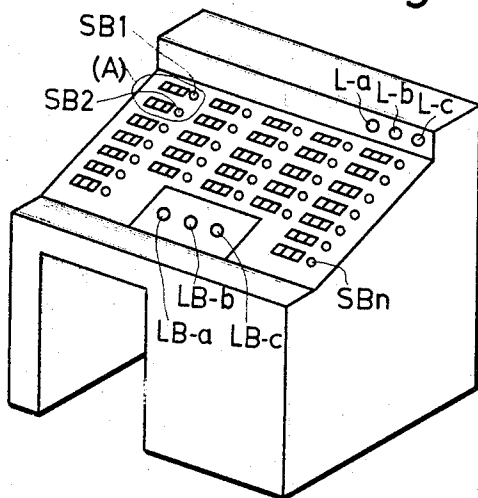


Fig. 1



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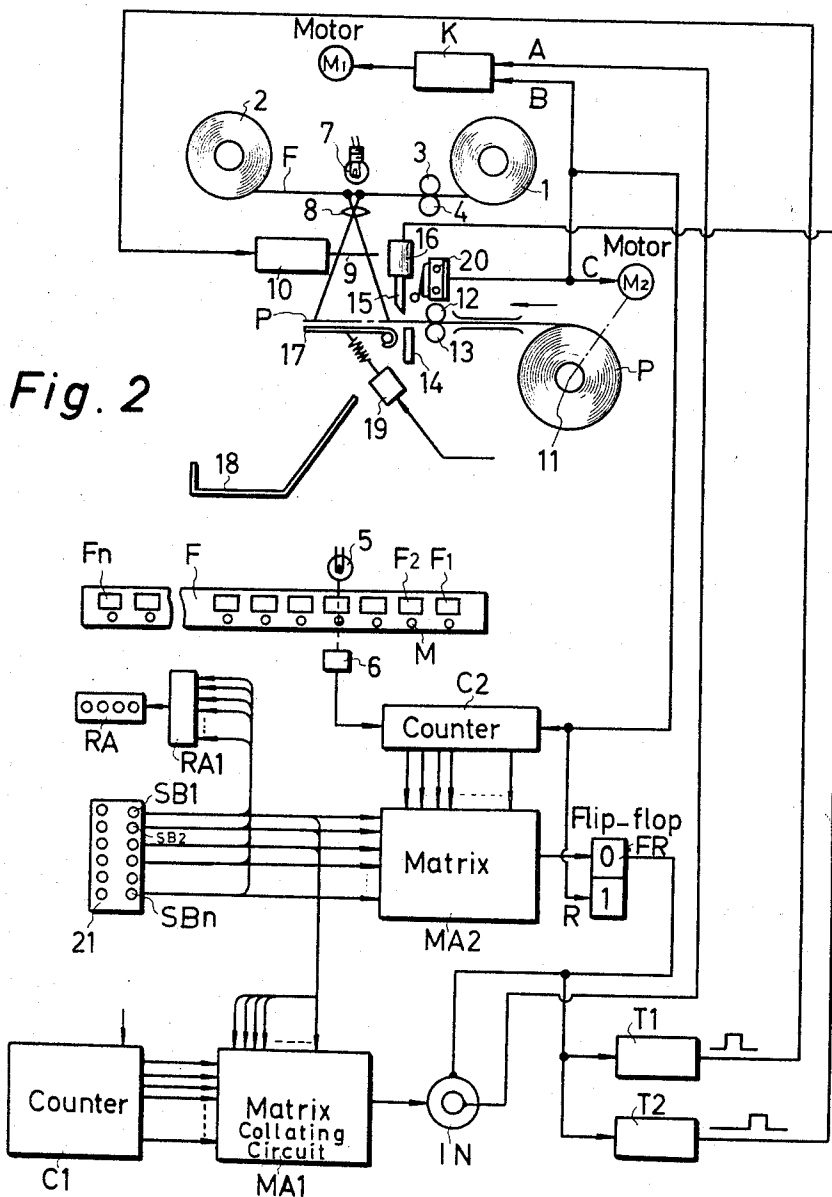
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Sheet 2 of 2



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3 Claims 10

ABSTRACT OF THE DISCLOSURE

Ticket issuing apparatus having equipment with negative ticket pictures thereon and means for selecting a desired ticket picture by actuation of a combination of appropriate switches. A collating circuit, also responsive to the switch actuation, assures that a proper charge has been made for a desired ticket, whereupon copying means copy the negative ticket picture onto a ticket which is issued.

The present invention relates to a ticket issuing apparatus.

There have been two types of the ticket issuing apparatus. One of the two types (hereinafter called "an (I) type apparatus") is an apparatus which stores a lot of tickets bearing predetermined printed articles and actuates to supply the ticket suitably in issuing thereof. The remainder of the two types (hereinafter called "a (II) type apparatus") is an apparatus which actuates in issuing each ticket to print out necessary articles on a printing paper by means of a stamp with ink and thereby to issue thereof as a ticket.

However, in case of dealing with various kinds of tickets (for example 200 (two hundred) kinds of tickets), it becomes necessary for the mentioned (I) type apparatus to be equipped with ticket magazines which store each ticket kind respectively and ticket supply mechanisms are complicated in construction and, therefore, it will be seen that the above mentioned (I) type apparatus becomes large in scale. Furthermore, in accordance with the above mentioned (II) type of apparatus, there should be provided with various kinds of stamps with printing ink to print out tickets and it is only possible to print out the same article on the ticket as the stamp in size, and therefore the printing mechanism of said (II) type apparatus becomes also complicated in construction and large in scale. It is impossible for said (II) type apparatus to deal with about 200 kinds of tickets. Judging from the mechanism, operation, manufacturing cost and operation time necessary to supply out a ticket of the conventional ticket issuing apparatus, it has been understood that these conventional apparatus can deal with no more than 20 (twenty) kinds of tickets.

Recently there is a tendency to desire to make various kinds of apparatus automatic and also the ticket issuing apparatus is no exception for the tendency. In other words, in spite of the facility of the conventional ticket issuing apparatus, it has been desired to provide an automatic ticket issuing apparatus which is able to deal with various kinds of tickets. In fact, if a small sized

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automatic ticket issuing apparatus which may deal with 100 (one hundred) through 1,000 (one thousand) kinds of tickets is placed at the main stations of the artery of the National Rail Way, the artery which has many stations, it will be very convenient for the artery user. If a ticket issuing apparatus which can deal with various kinds of tickets is provided and a man is appointed as an expert operator of the apparatus, works on the ticket issue at each station will be more rationalized. Moreover, if the apparatus issues tickets different in size, works on the ticket issue at each station will be also rationalized.

Accordingly, it is an object of the present invention to provide a ticket issuing apparatus which is not large in size and which is able to deal with many kinds of tickets.

It is another object of the present invention to provide a ticket issuing apparatus which is adapted to issue a large number kinds of tickets.

Another object of the invention is to provide a ticket issuing apparatus wherein a desired ticket may be quickly and easily selected by actuation of a combination of appropriate switches.

It is further object of the present invention to provide a ticket issuing apparatus which settles the problems of the conventional ticket issuing apparatus. The problem of the conventional (I) type apparatus is the troublesome-ness in enclosing tickets into the ticket magazines, and the problem of the conventional (II) type apparatus is the frequent occurrence of the printing obscurity on the ticket.

Further objects of the present invention will become apparent from the following detailed description and annexed drawing wherein:

FIG. 1 is a perspective view of a ticket issuing apparatus of the present invention embodied therein,

FIG. 2 is a circuit diagram of one embodiment in accordance with the present invention,

FIG. 3 shows an electrical circuit of a selection board which is a portion of the control circuit shown in FIG. 2, and

FIG. 4 is an enlarged partial perspective view (A) of a panel of the present ticket issuing apparatus shown in FIG. 1.

Referring to FIG. 2, F is a film running between a reel 1 and a reel 2. The film F is provided with various kinds of negative pictures F1, F2, . . . and F_n as ticket copying negatives thereon. The film F is also provided with signal mediums M corresponding to each of the negative pictures. According to the present embodiment, the signal medium M is a form of punched hole. When a motor M₁ is driven counter clockwise, the film F runs back from the reel 2 to the reel 1. 5 and 6 are a light source and a photo-electric element, respectively, which are placed facing each other with the film F there between. It is noted that the light source 5 and the photo-electric element 6 composes a detecting means to detect the signal medium M provided on the film F. 7 is a light source to supply a light passing through the negative pictures on the film F, and 8 is a lens to focus the light passed through the negative pictures. 9 is a shutter and 10 is a control means to control the operation of the shutter 9. P is a printing paper which is adapted to print out (copy) the image of copying negative by reception of the light passed through the negative. The printing paper P is

wound on a roller 11 and is designed to be fed in the direction of an arrow by means of a constant speed motor M₂. 12 and 13 are guide-rollers for feeding the printing paper P. 14 and 15 are fixed and movable knives, respectively, which operate to cut the printed portion of the printing paper P. 16 is an electro-magnet device to drive the movable knife 15. It is noted that the fixed knife 14, the movable knife 15 and the electro-magnet device compose a cutter for the printing paper. 17 is a discharge guide plate which actuates to supply a printed ticket to an exhaust outlet 18, the plate 17 which is energized by an electro-magnet device 19 so as to be opened to guide the ticket to the exhaust outlet 18. 20 is a switching means designed to operate in case of the cutter operating to cut the printing paper P, and the switching means 20 supplies a film reversing indication signal B to reverse the running direction of the film, a feeding indication signal C to feed the printing paper P for a predetermined length, and a reset signal R to reset the flip-flop circuit described hereinafter.

The control circuit of the present apparatus will be explained as follows. 21 is a selector-board including a plurality of selector push button switches SB₁, SB₂ . . . and SB_n to select desired tickets. These selector push button switches correspond to each of the negative pictures on the film, that is, each kind of tickets, respectively. As apparent from FIG. 2, each output of the selector push button switches are connected to a collating circuit MA₁, a matrix circuit MA₂ and a control circuit RA₁ of an indicator to indicate the demanded amount of money of the desired ticket. When each selector push button switch SB is operated, the selector push button switch supplies the following three signals from the output terminal thereof. The first signal of the three signals is a signal which indicates the amount of charge of the ticket to be issued, to the ticket corresponds said operated selector push button. The second signal is a signal to select a negative picture on the film which corresponds to said operated selector push button switch. The third signal is a signal to indicate visibly the amount of charge of the ticket to be issued. It is noted that these three signals are dispatched simultaneously with the selecting operation of the selector push button switch. C₁ is the first counter which operates to count the amount of the inserted money and to supply from the output terminal thereof an output signal corresponding to the amount of said inserted money. The collating circuit MA₁ operates to collate the amount of the inserted money with the amount of charge of the desired ticket on the receipt of the output signal from the first counter C₁ and the first signal provided by the selecting operation of the selector push button switch SB. Only when the amount of charge of the desired ticket is equal to the amount of the inserted money or the amount of inserted money is larger than the amount of charge of the desired ticket, the collating circuit MA₁ supplies an able signal. Furthermore, it is noted that the collating circuit MA₁ operates so as to supply a command signal which commands to feed the change in case of the amount of the inserted money being larger than the amount of charge of the desired ticket.

IN is an inhibit circuit which has always no inhibit input and the inhibit circuit IN actuates to supply a clockwise rotation driving signal A to an exchange switch K so as to make the film F normally operate on the receipt of the able signal from the collating circuit MA₁. C₂ is a counter which receives pulses from the photo-electric element 6 to detect the holes M on the film F and supplies an output from the terminal thereof corresponding to the number of the received pulses. As mentioned above, MA₂ is a matrix circuit which receives each output signal from the counter C₂ and each second signal to select the negative picture on the film F from the selector push button switch SB. It is noted that the matrix circuit MA₂ supplies an output signal when the circuit receives an output pulse from the counter C₂

which indicates the negative picture corresponding to the selected push button switch. RA is an indicator which indicates the amount of charge of the desired (selected) ticket by the third signal corresponding to the selected push button switch SB, and RA₁ is a control device of the indicator RA. FR is a flip-flop circuit which receives, as an input, the output signal from the matrix circuit MA₂ at the "0" side thereof and receives, as another input, the said reset signal R from the switching means 20 at the "1" side thereof. The output signal from the flip-flop circuit FR is supplied to the shutter control means 10 through a slow-operating timer T₁ and also to the electro-magnetic device to control the cutter and gate through a slow-operating timer T₂. At the same time, the output signal from the flip-flop circuit FR is supplied to the inhibit gate circuit IN as an inhibit input signal. The delay time of the slow-operating timer T₁ is shorter than that of the slow-operating timer T₂.

The operation of the present apparatus will be explained in detail as follows:

A ticket available to the present apparatus is a passenger ticket. At first, the operation of the selector board is illustrated in detail with reference to FIG. 1 through FIG. 4. Referring to FIG. 1 through FIG. 4, wherein

LSa₁, LSa₂ . . . LSa_n are indicator lamps which indicate names of stations respectively which are belonging to "a" Line (for example, Tokaido Line) and located in consecutive order from the specific station where the present apparatus is equipped.

LSb₁, LSb₂ . . . LSb_n are indicator lamps which indicate names of stations respectively which are belonging to "b" Line (for example, Sanyo Main Line) and located in consecutive order from the specific station where the present apparatus is equipped.

LSc₁, LSc₂ . . . LSc_n are indicator lamps which indicate names of stations respectively which are belonging to "c" Line (for example, Sanin Main Line) and located in consecutive order from the specific station where the present apparatus is equipped. Though only three lines are shown in FIG. 3, it is noted that the present invention is not limited by this embodiment and that the present invention may adopt the desired numbers of lines.

As shown in FIG. 3 and FIG. 4, SB₁, SB₂ . . . and SB_n are a group of the selector push buttons. The selector push button SB₁ is located on a panel of the selector board 21 on the same level with the indicator lamps LSa₁, LSb₁ and LSc₁. The selector push button SB₂ is also placed on the panel of the selector board 21 on the same level with the indicator lamps LSa₂, LSb₂ and LSc₂. As same way, the selector push button SB_n is placed on the panel of the selector board 21 on the same level with the indicator lamps LSa_n, LSb_n, LSc_n. It will be seen from a circuit diagram shown in FIG. 2 that each of the selector push buttons SB₁, SB₂ . . . and SB_n has circuit contacts equal to the number of railway lines (in accordance with the present embodiment, three lines "a," "b" and "c"). In other words in detail, referring to FIG. 3, the selector push button SB₁ has three circuit contacts SB₁-a, SB₁-b and SB₁-c, the selector push button SB₂ has three circuit contacts SB₂-a, SB₂-b and SB₂-c, and, as same way, the selector push button SB_n has three circuit contacts SB_n-a, SB_n-b and SB_n-c. It is noted that when one selector push button is pushed the three circuit contacts belonging to the selector push button is closed simultaneously.

Referring to FIG. 1, Fig. 3 and FIG. 4 again, LB-a, LB-b and LB-c are switch buttons of the railway lines "a," "b" and "c," respectively, and L-a, L-b and L-c shows line lamps of the railway line "a," "b" and "c," respectively.

Now, it is supposed that an operator for the present apparatus desires the ticket for LSb₂ station belonging to the railway line b. At first, when the operator pushes the switch LB-b of the railway line b which is one of said switch buttons, the circuit contact of the switch button LB-b is closed to light the line lamp L-b and the station

indicating lamps LSb1, LSb2 . . . and LSbn which indicate the names of the stations belonging to the line "b."

Then, by pushing the selector push button SB2 located on the same level with LSb2 station, the three circuit contacts SB2-a, SB2-b and SB2-c of the selector push button SB2 are closed to supply an output signal corresponding to the desired station LSb2 from the selector board 21 through the circuit contact of the switch button LB-b and the circuit contact SB2-b of the selector push button SB2. As described above, this output signal from the selector board 21 is supplied in parallel to the collating circuit MA1, the matrix circuit MA2 and the control device RA1 of the indicator which indicate the amount of charge of the desired ticket.

Furthermore, assuming that the negative picture F2 on the film is a negative picture available to copy the ticket for LSb2 station from the specific station where the present apparatus is located and that the amount of charge of the desired ticket is one thousand (1,000) yen, the first signal corresponding to the amount of charge of the desired ticket is supplied to the collating circuit MA1 from the selector board 21. And this first signal corresponding to the amount of charge of the desired ticket, that is, the amount of 1,000 yen is registered in the collating circuit MA1. When cash amount of 1,000 yen is inserted into the counter C1 of the present apparatus, the counter C1 will supply a signal indicating the inserted cash of 1,000 yen to the collating circuit MA1. On receipt of the signal from the counter C1, the collating circuit MA1 feeds an output through the inhibit circuit IN to the film driving motor M1 so that the motor M1 may be driven in the normal direction. When the film F is being run from the reel 1 to the reel 2 by the normal operation of the film driving motor M1, the photo-electric element 6 provides pulses by the receipt of the light through the hole M from the lamp 7. The pulses are supplied to the counter C2. When the matrix circuit MA2 receives the second pulse, that is, the matrix circuit MA2 receives a pulse from the second terminal of the counter C2, the matrix circuit MA2 supplies an output signal. Because, the second signal corresponding to the selector push button switch SB2 has been registered in the matrix circuit MA2 since the selector push button switch SB2 was operated. The output signal from the matrix circuit MA2 actuates the flip-flop circuit FR to supply an inhibit input therefrom to the inhibit circuit IN so as to stop the operation of the film feeding motor M1. At the same time, the output from the flip-flop circuit FR is delayed by means of the delay operation timer T1 and then actuates to open the shutter 9 so as to copy the negative picture F2 on the printing paper P. Thereafter, the cutter is driven by a signal which is obtained from delaying the output from the flip-flop circuit FR through the timer T2. Accordingly the copied portion of the printing paper is cut by the operation of the cutter and then the plate 17 is opened so that the copied portion which is the desired ticket for the LBb2 station may be issued from the exhaust outlet 18. At the time when the cutter is driven, the switch means 20 supplies an output which actuates to make the film F return from the reel 2 to the reel 1 and also to make the printing paper P feed with a predetermined length. At the same time, the output from the switch means 20 actuates to reset the flip-flop circuit FR so as to release the inhibit input excitation of the inhibit circuit IN and to prepare itself for the following selecting operation of the selector push button switch.

The foregoing explanation has been done with respect to an issue of the ticket for the LSb2 station from the specific station where the present apparatus is located. However, it is noted that the foregoing explanation can be also available to in case of issuing the ticket for n station, where the ticket for the n station is printed on the printing paper by means of the negative picture Fn on the film F and then is supplied to the exhaust outlet 18.

From the foregoing, it will be understood that the ticket issuing apparatus in accordance with the present invention can copy the desired ticket including the necessary items by means of the selected negative picture as an original. Therefore, the issuing method provided by the present invention can be called "indirect method" as compared with the conventional "direct method" wherein the ticket is made by stamping necessary items on a piece of paper by means of the necessary stamp with an ink. Accordingly, in accordance with the present invention, it is seen that a ticket issuing apparatus which is expected to deal with various kinds of tickets will process the chain of ticket issuing operation from the negative picture selection to the ticket exhaust with higher speed than that of the conventional ticket issuing apparatus and that the ticket issuing portion of the present apparatus can be made more compact in construction than that of the conventional one. Moreover, the ticket issuing apparatus provided by the present invention can issue easily such a large size ticket as a ticket for the round trip. Furthermore the present invention has a merit of the fact that the copied letter or design on the issued ticket is printed out clearly and that the hands and the like of operator will never be made dirty with an ink for a ticket because the present invention needs no stamping operation with an ink. In accordance with the embodiment above, there is illustrated, as a negative picture equipment means, a tape provided with negative pictures thereon, but it is also possible to utilize, as a negative picture equipment means, for example, a drum which is provided with negative pictures on the surface thereof.

From the foregoing, those skilled in the art will observe that the present invention, as described herein, achieves and realizes all of the objects and advantages of the invention as outlined in the foregoing, as well as having many additional advantages that are apparent from the detailed description. The foregoing disclosure is representative of preferred forms of the present invention and is to be interpreted in an illustrative rather than a limiting sense.

What is claimed is:

1. A ticket issuing apparatus comprising, negative picture equipment means having various kinds of ticket negative pictures thereon, driving means adapted to drive said negative picture equipment means, selecting means adapted for selecting a desired ticket, detecting means adapted for detecting the desired ticket negative picture on the negative picture equipment means which is being driven, first matrix means adapted to detect the coincidence between a signal corresponding to the amount of the inserted money and the first signal from said selecting means, second matrix means adapted to detect the coincidence between an output from said detecting means for the desired ticket negative picture and the second signal from said selecting means, control means adapted to control said driving means of outputs from said first and second matrices, copy means adapted to copy said desired ticket negative picture on a printing paper by means of an output from said second matrix, and means adapted to exhaust the copied printing paper as the desired ticket.

2. In a ticket issuing apparatus as set forth in claim 1, said selecting means comprising: a group of switch buttons for selecting railway lines; a group of switches located on a panel of said means for selecting desired stations; station name indicating means for each of said railway lines connected to said group of switches respectively; means to drive the selected one of said station name indicating means belonging to the selected railway line in response to the selection of the switch button for selecting the desired railway line; and circuit means adapted for supplying a selecting signal of the desired station by selecting one of said station selecting switches and one of said railway line selecting switch buttons.

3. In a ticket issuing apparatus as set forth in claim 2, said selecting means comprising: a group of switch but-

tons for selecting railway lines; line name indicating means for indicating the names of the selected railway lines; a group of switches located on a panel of said means for selecting desired stations; station name indicating means for each of said railway lines connected to said group of switches respectively; means to drive the selected one of said station name indicating means belonging to the selected railway line and the selected one of said line name indicating means in response to the selection of the switch button for selecting the desired railway line; and circuit means adapted for supplying a selecting signal of the desired station by selecting one of said station selecting

switches and one of said railway line selecting switch buttons.

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