

Aug. 13, 1957

T. E. HAYES
MONEY COUNTING MACHINE

2,802,626

Filed Oct. 15, 1954

2 Sheets-Sheet 1

Fig. 1.

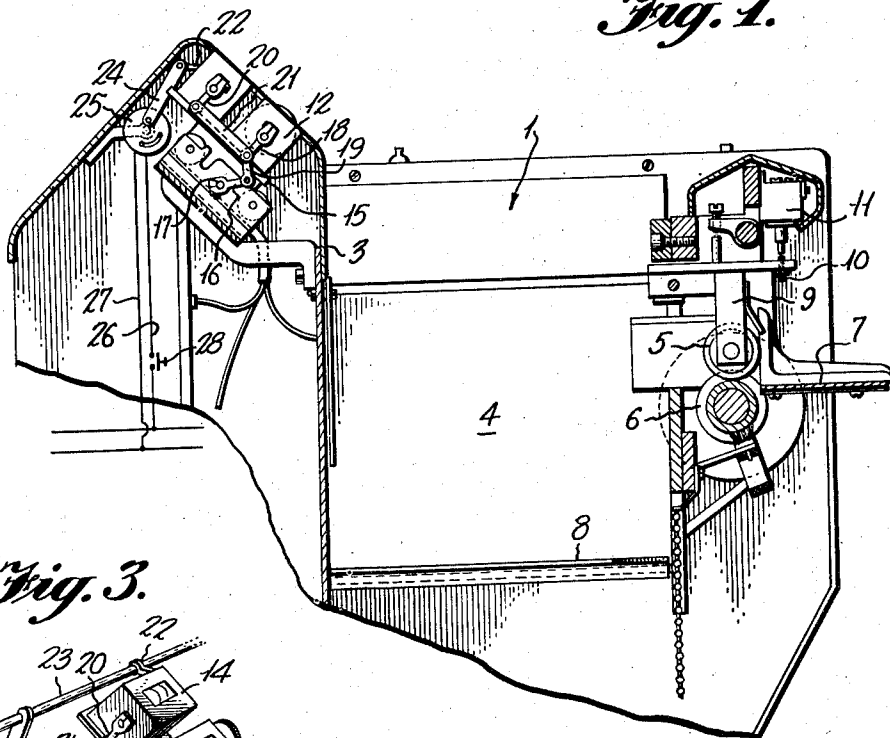


Fig. 3.

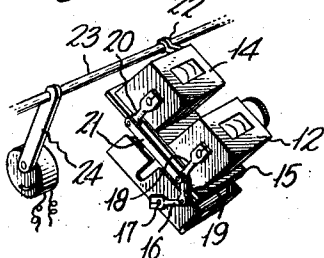
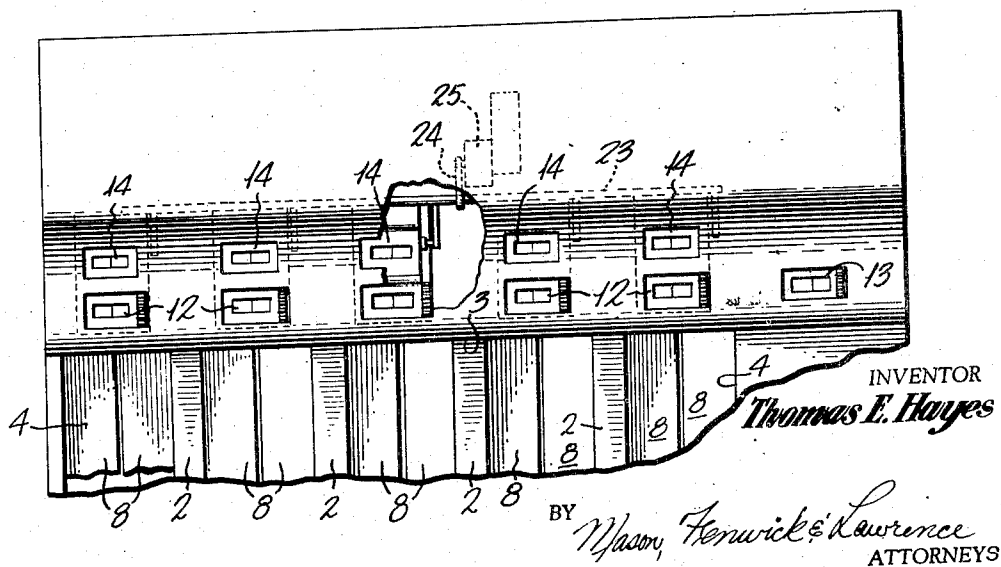


Fig. 2.



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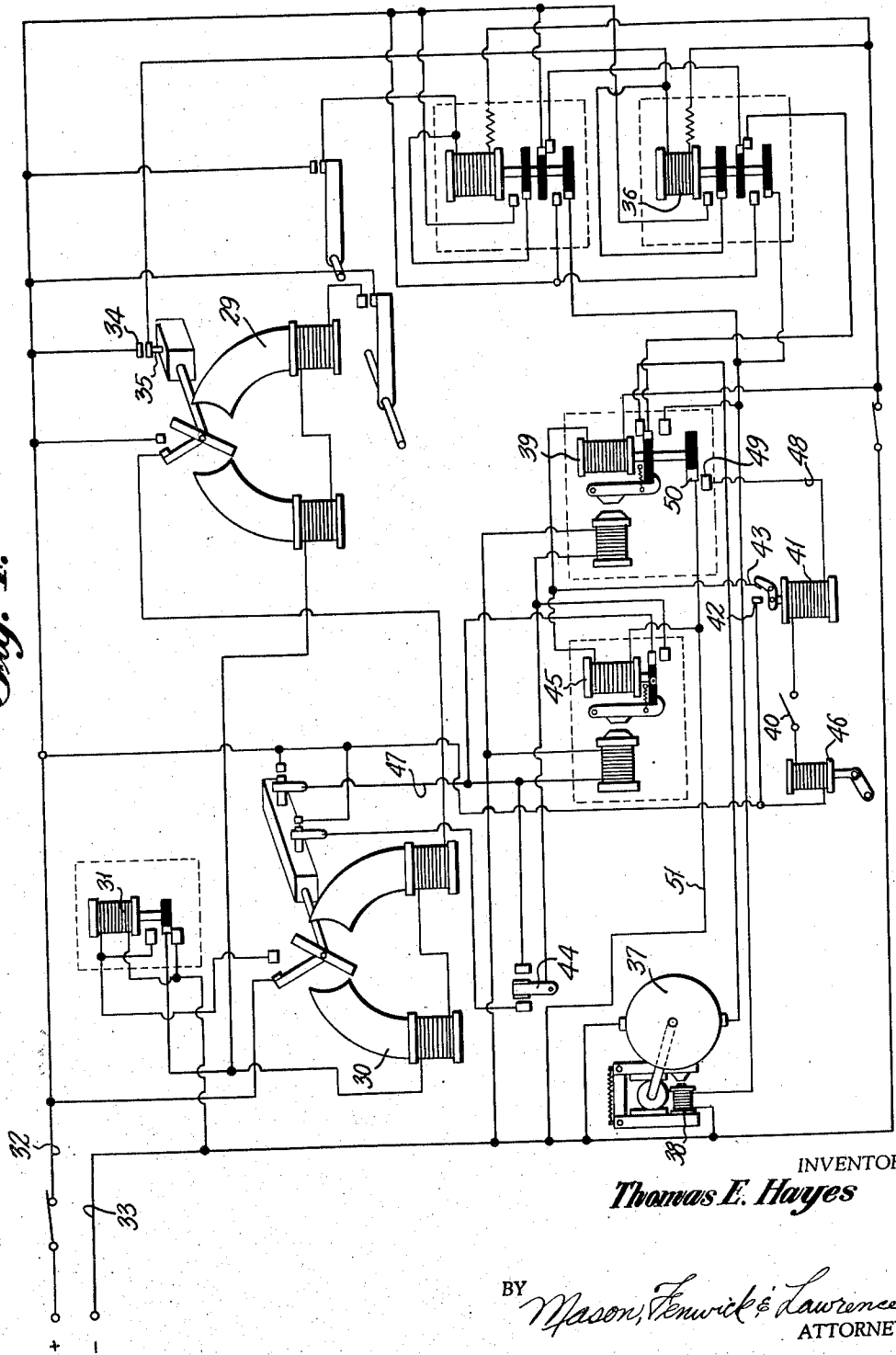
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Fig. 4.



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MONEY COUNTING MACHINE

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1 Claim. (Cl. 235—92)

This invention relates to machines for use in sorting and counting paper money and is an improvement over the machines disclosed in Patents Nos. 2,271,394 and 2,429,159.

These prior patents disclose machines having a plurality of compartments to receive paper money as it is sorted, with means at each compartment for counting the pieces as they are inserted and a totalizer which registers the total number of pieces fed into the machine. As the bills enter the compartments, they are deposited upon shelves where they remain until the count of a particular strap is completed. After the count is checked and found to be correct, the shelves are dumped and the bills drop into storage compartments below. The shelves are biased toward horizontal position and as they automatically return to this position they re-energize the operating circuit and restart the machine.

The bills to be counted are usually in straps of 100 and the totalizer should register 100 or zero after all of the bills are fed to the machine. If the totalizer shows a count of 99, for example, the operator will know that the strap is short one bill or the machine has made a miscount. It is then necessary to recheck the bills to prove the count. This is time consuming, as all of the bills above the shelves must be recounted by hand or the bills in each compartment above the last separator must be counted by hand to check the total against the number shown on the individual piece-counter for that particular compartment.

The principal object of the present invention is to provide means whereby the number of bills on the shelves in each of the compartments will be registered so that the operator can total the piece-counters for comparison with the totalizer to learn if a miscount has been made on the totalizer.

A more specific object is to provide a bill sorting and counting machine in which an additional piece-counter is provided at each compartment to register the number of bills fed to that compartment during each strap count, with means for returning the auxiliary counters to zero after each strap count is completed and checked.

Other objects of the invention will become apparent from the following description of one practical embodiment thereof, when taken in conjunction with the drawings which accompany and form part of this specification.

In the drawings:

Figure 1 is a vertical section through the upper portion of a paper money sorting and counting machine, embodying the improvement of the present invention;

Figure 2 is a partial top plan view of the machine shown in Figure 1, parts being broken away in section;

Figure 3 is a perspective view of the double counter unit and the means for returning the auxiliary counters to zero; and,

Figure 4 is a circuit diagram illustrating how the auxiliary counter reset mechanism may be installed.

Paper money is received at Federal Reserve Banks from

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their member banks in stacks of 100 bills or, as it is sometimes the case with bills of larger denomination, in stacks of 50, with a paper band or strap encircling the bills, the strap having marked thereon the amount of money within the strap. Under existing regulations, Federal Reserve Banks may issue money, but when these Federal Reserve Notes have been put into circulation and are taken into a Federal Reserve Bank, they can be put into circulation again only by the issuing bank. When a Federal Reserve Bank receives the above-mentioned straps of bills, the bills must not only be counted to check the forwarding bank's count, but the bills must be sorted in accordance with the bank of issue and, in some cases, into "fit" and "unfit" bills. The above mentioned patents disclose machines which are capable of performing both of these operations simultaneously.

In general, the present invention consists in providing auxiliary piece-counters at each of the various compartments of the machine which are coupled to the principal piece-counters for simultaneous operation therewith, so that a check of each count may be made quickly. Means are provided for zeroing these auxiliary counters after every count.

Referring to the drawings in detail, there is shown a cabinet 1, in which a plurality of vertical partitions 2 are arranged in parallel relation against a back wall 3, to form a series of compartments 4. Each compartment has a horizontal cross section of approximately the same size and shape as a bill and is adapted to accumulate stacks of bills, one bank of issue to each compartment. A plurality of pairs of bill-feeding rollers are arranged, one pair at the upper forward end of each compartment. The lower rollers 6 are driven rollers, and the upper rollers 5 are caused to rotate by the passage of a bill between the rollers. A shelf 7 extends horizontally in front of said series of compartments and has its upper surface at about the level of the line of contact between the rollers. The compartments 4 are divided vertically near the top by a pair of horizontal shelves 8 which are hinged from the partitions 2 with their free longitudinal edges meeting at the center line of the compartment. When bills are fed into the compartments they accumulate upon the shelves 8 until all of the bills in a strap have been sorted and the count verified, at which time the bills are dumped into the lower or storage portion of the compartment.

Patent No. 2,429,159 discloses the means by which the shelves 8 are dumped, also the control mechanism which stops the machine when the totalizer counts the 100th bill and the means by which the machine is restarted when the shelves return to horizontal position.

Referring again to the feed rollers, the upper roller 5 is mounted upon a tilting support 9 which carries in its free end an adjusting screw 10 which operates a microswitch 11 when the roller 5 is lifted by the passage of the bill between the pair of rollers. The microswitch controls a number of circuits, one of which causes the actuation of a piece-counter 12 associated with the compartment to which said switch belongs and, through the piece-counter, the actuation of a totalizer 13. The piece-counters and totalizer are of conventional form, such as is shown in the patent to Veider No. 1,480,738.

As described in Patent No. 2,429,159, there are three eventualities during the sorting and counting operation which will automatically cause the machine to stop. One of these is when 100 bills have been registered on the totalizer. Upon the count of 100, the machine will stop, indicating to the operator that a strap has been counted. After a predetermined slight pause, the machine will start to pass the 100th bill from between the feed rollers into its compartment and then stop. This gives the operator

an opportunity to check the strap just sorted. If the count is correct the shelves 8 are then dumped by pressing a button, and when the shelves return to horizontal position, the machine restarts. A second of these is when 100 bills have been accumulated in any one of the various compartments. When this occurs, the machine stops momentarily to indicate that a strap has been accumulated in that compartment and after a slight pause starts again. The pause in operation may be accompanied by the lighting of a signal lamp over the particular compartment. The operator will place a separator in the compartment to segregate the 100 bills already counted from those to follow. The piece-counters at each of the individual compartments control this second operation, and therefore, the number registered on these counters usually includes bills which have been dumped into the storage compartment as well as those placed upon the shelves during the instant count. There is no way, therefore, that the operator can use these piece-counters to check the total registered in the totalizer.

The present invention contemplates the coupling of an auxiliary piece-counter 14 to each of the piece-counters 12. The piece-counters 12 and the auxiliary counters 14 will be mounted as units upon brackets 15 for convenience in mounting in the machine. A pair of windows will be formed adjacent each compartment so that readings may be made from the respective counters. The auxiliary piece-counters are not connected into the operating circuit of the machine, but are controlled and operated by means of levers 16 which are fixed to the ends of armature shafts 17, which levers 16 are connected to the counter actuating levers 18 by means of links 19. The auxiliary piece-counters each have an operating lever 20 which is connected to the operating lever 18 of the primary counter by means of links 21. Through this arrangement counters 14 will be caused to operate and make one count each time the piece counter makes a count.

Each auxiliary counter 14 will be provided with a lever 22 by means of which the counter may be re-set to zero. This permits the auxiliary counter to be zeroed each time a count is started so that auxiliary counter will register only the number of bills on top of the shelves in the compartment with which it is associated. This will enable the operator to have a constant check, as at any time the numbers shown on the auxiliary counters may be totaled for comparison with the number shown on the totalizer. Thus, when an operator feeds all of the bills of a strap into the various compartments of the machine and the totalizer at the completion of the operation shows less than 100 he can immediately check the auxiliary counters to determine whether there is a shortage in the strap or the totalizer has made a miscount. This saves hand counting of the bills on the shelves or a check of each compartment from the last separator against the total shown on the primary piece-counter.

In order to speed up operations, means are provided to re-set all of the auxiliary counters through a single operation. This means includes a bar 23 which is connected to all of the re-set levers 22 and is mounted for vertical movement. The bar may be attached to the end of a link 24 which may be caused to move by means of a rotary solenoid 25 attached to a convenient portion of the machine. This solenoid will be connected to power wires 26 and 27, and a switch 28 may be put into either of these wires. By pressing a button, the operator will close the solenoid circuit, causing it to operate and move the lever 24, depressing the bar 23 to rotate all of the levers 22 to re-set the auxiliary piece-counters to zero before beginning a new count.

In order to prevent the operator from starting a new count without first re-setting the auxiliary counters, the re-set mechanism may be included in the circuit which controls the dumping of the shelves and restarting of the machine. As has been explained the machine automatically stops when the totalizer reaches a count of 100, or

in some machines when a fractional part thereof is reached, and the restarting circuit includes means for dumping the shelves so that no bills will be upon the shelves when the new count begins. Thus, if the auxiliary counter reset is also controlled by this circuit it will assure all necessary operations being done before a new count can be begun.

Figure 4 shows a typical wiring diagram for the money counting machine and is essentially the same as that disclosed in Patent No. 2,635,811, wherein the machine is automatically stopped at one hundred or fifty totalizer count and will not restart until the shelves are dumped. It will be understood that the auxiliary counter re-set may be incorporated in any other wiring arrangement which includes shelf dumping means.

Referring to Figure 4, there is shown a counter unit 29, totalizer 30 and holding relay 31. These units are connected into circuits including the line leads 32 and 33, so that when a bill is inserted between the rollers of a compartment the counter will be energized. The operation of the counter closes a circuit to the totalizer, and the totalizer will cause the holding relay to be actuated and permit the counter and totalizer to return to their positions of rest. When the counter has reached one hundred, contacts 34 and 35 close to establish a circuit to the one hundred bill relay 36 which, when activated, causes the motor 37 to stop and the brake 30 to be applied. With the arrangement shown, when the totalizer reaches a fifty count latch relay 39 is energized which also will interrupt the motor circuit and apply the brakes. The motor cannot be restarted until switch 40 is closed to activate shelf-dumping solenoid 41. When this is done, contacts 42 and 43 close releasing the brakes, restarting the motor and resetting latch relay 39. When the control switch 44 is set for one hundred count, latch relay 45 is tripped at fifty count establishing a circuit to latch relay 39 so that the latter will trip at the second count of fifty. All of the above is described in detail in Patent No. 2,635,811.

In order to make the auxiliary counter re-set work in unison with the shelf-dumping, and thereby make it impossible to restart the motor without resetting the auxiliary counters, it is necessary only to place the resetting solenoid 46 in the circuit controlling the shelf-dumping solenoid 41. This circuit includes the lead wire 32, wire 47, reset solenoid 46, switch 40, shelf dumping solenoid 44, wire 48, contacts 49 and 50 of latch relay 29, which will be closed at that time, wire 51 and lead wire 33. When switch 40 is closed solenoids 46 and 41 will be energized to reset the auxiliary counters, dump the shelves and close contacts 42 and 43. Contacts 42 and 43 will close the circuits to release the brakes, start the motor and reset relay 39.

It will be obvious that the counters may be reset in many different ways, and the particular arrangements shown are merely by way of example. It is also contemplated that auxiliary counters having built-in electrical re-set means may be used instead of the manually re-set counters disclosed herein.

The provision of auxiliary counting means which can be used as a check of the accuracy of the totalizers will save many hours of laborious hand counting which has been necessary with previous machines. The former machine kept the bills of the particular strap undergoing count separated from the remainder in the machine, and the present invention provides means for maintaining an accurate count of the separated bills in each compartment as an additional aid in speeding up the operation.

While in the above one practical embodiment of the invention has been disclosed, it will be understood that the particular structure shown and described is merely for purposes of illustration and the invention may take other forms within the scope of the appended claim.

What is claimed is:

A machine for sorting and counting paper money having a plurality of bill receiving compartments, separa-

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ble bill feeding means associated with each compartment, a piece counter associated with each compartment and actuated by separation of said bill feeding means, an auxiliary piece counter coupled to each of the prior mentioned piece counters and operable in unison therewith, a totalizer receptive to separation of any of bill feeding means, means to stop the operation of said bill feeding means upon a predetermined count being reached, shelves in each compartment, means to dump said shelves

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and simultaneously re-start said bill feeding means, said auxiliary counters having reset means, and said reset means being actuated by said means to dump the shelves.

References Cited in the file of this patent

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