

April 3, 1934.

S. CHIGER

1,953,073

APPARATUS FOR RECEIVING, ISSUING, AND COUNTING BANK NOTES

Filed Dec. 14, 1929

2 Sheets-Sheet 2

Fig. 2

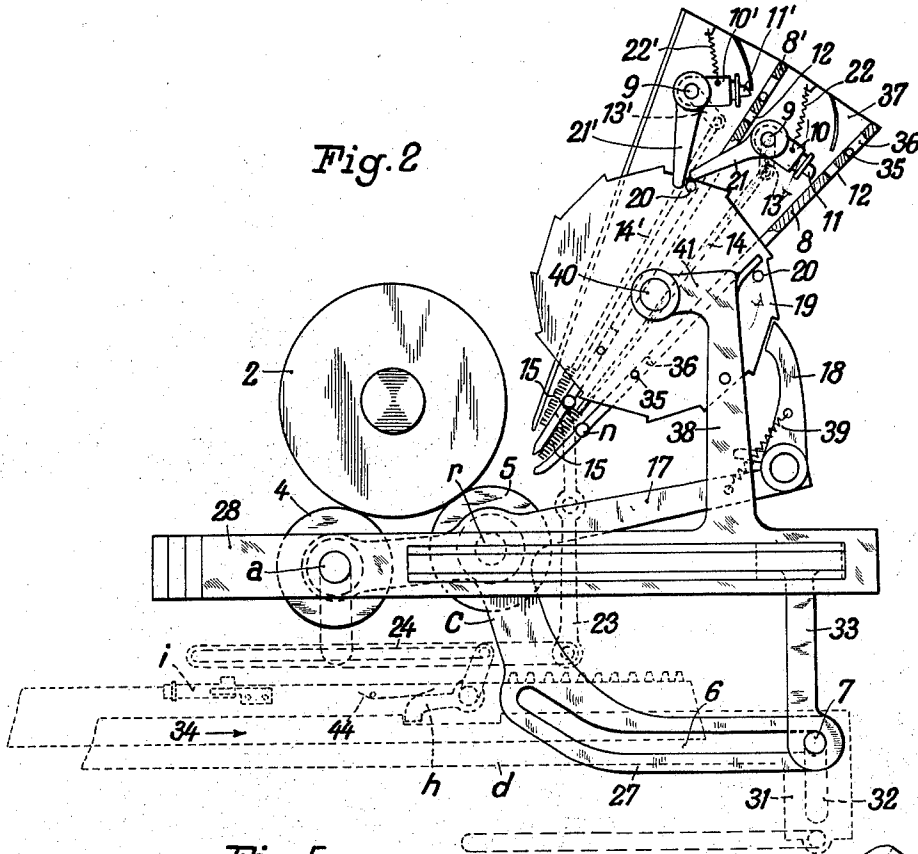


Fig. 5

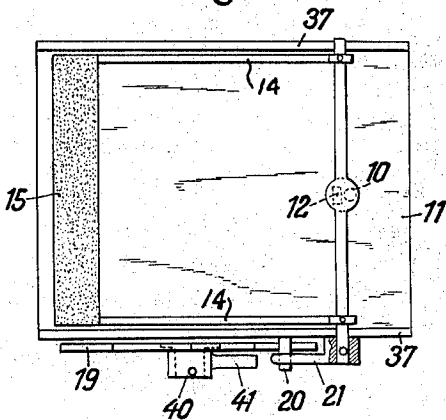
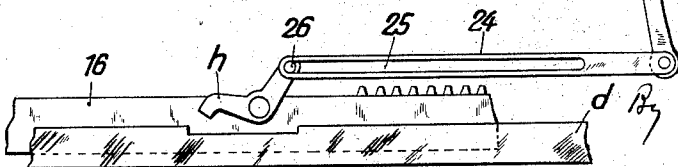
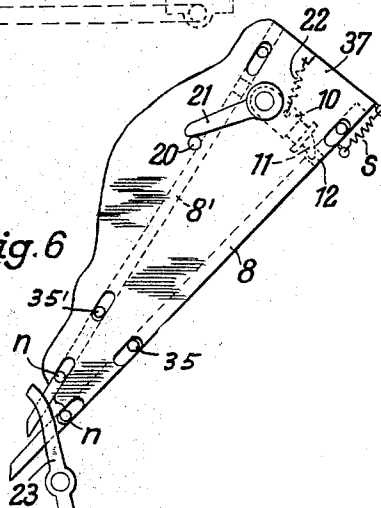


Fig. 6



Inventor:

Sigmund Chiger,
Atty.

UNITED STATES PATENT OFFICE

1,953,073

APPARATUS FOR RECEIVING, ISSUING, AND
COUNTING BANK NOTESSiegmond Chiger, Berlin, Germany, assignor to
firm G. Z. M. Patentverwertungs Aktiengesell-
schaft, Glarus, SwitzerlandApplication December 14, 1929, Serial No. 413,975
In Germany December 10, 1923

5 Claims. (Cl. 133—1)

The invention relates to paper money receiving and dispensing machines of the type in which the receiving and issuing of the individual bills is effected by means of a conveyor band, wound from one roller onto another roller.

In connection with such machines the insertion of the bills consumes a great deal of time, if the operator must place the bills, one after the other, in a single receiving opening in order to feed same to the conveyor band or tape.

A special purpose of the present invention is to receive a large number of paper money or bills simultaneously, and to feed same automatically in quick succession to the receiving band. In this way an operator need not wait as heretofore for the complete receiving by the band of each individual bill before inserting another bill, but on the contrary he may feed the bills one after another rapidly into the different receiving devices as the previously inserted bills are withdrawn from said devices. Thus, a considerable saving of time is effected in supplying the machine with any given number of bills.

Another special purpose of the invention is to provide novel means for feeding the bills successively from the receiving devices to the band.

A further special object of the invention is to provide novel means to render the machine ineffective to actuate the receiving band in the event it is attempted to operate the machine in the absence of a bill to be received by said band.

With the foregoing and various other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

The subject matter of the invention is shown, in an embodiment, in the drawings, in which Fig. 1 is a side elevation of the machine showing the parts thereof in normal position. Figure 2 is a side elevation, partly a section, of the machine showing the parts thereof in an operating position.

Figure 3 is a plan view showing the coupling between the driving rod element and the band actuating rack of the machine.

Figure 4 is a plan view of the bill supporting table of one of the bill receiving devices.

Figure 5 is a plan view illustrating the bill feeding mechanism of one of the receiving devices.

Figure 6 is an elevation showing the manner in which the disengaging of the band driving de-

vice takes place, if an attempt is made to operate the machine in the absence of a bill to be received by the band.

The device for the receiving of the bills consists essentially of a conveyor band 1, which runs from a roller 2 to a roller 3. The rollers 2 and 3 are rotatably mounted on the spindles *u* and *t* in the housing walls *g*, so that the band 1 for the receiving of the bills is wound from the roller 3 onto the roller 2, and can be drawn from the roller 2, for the issuing of bills, by means of roller 3. Between the two rollers 2 and 3, there are arranged the guide rollers 4 and 5, for the band 1, of which the former is rotatably supported on the spindle *a* and the latter is rotatably supported on the spindle *r*.

The spindle "*a*" of roller 4 is guided for vertical sliding movement in slots 6 of the housing wall *g*, and is under the influence of the springs *f*, which tend to press the roller 4 against the roller 2. The spindle "*a*" passes through a hole in the beam 28, which is arranged horizontally, and is shiftable vertically on guides 29 and 30, if, in accordance with the diameter of the roller 2, the roller 4, resting against same, moves upward or downward. On the spindle "*a*" of the roller 4 is pivoted a lever *c*, which carries the spindle *r*, on which the roller 5 is rotatably supported. The lever *c* is provided with an arm 27, which extends, in an arc-shaped manner, below the spindle *r*, and which is provided with a slot 6.

The drive of the device takes place by the reciprocating motion of a rod *d*, which, as shall be described later on, transmits its motion to the winding-on roller 2. In this connection the reciprocating motion of the rod *d* can be effected, by any desired means, by hand or by power drive, this not being shown especially in the drawings.

The rod *d* carries a projection 31, in which a vertical slot 32 is provided. Mounted on the beam 28 for longitudinal sliding movement relative thereto is an arm 33, which depends therefrom and carries a pin 7, which passes through the slot 6 of the arm 27, and also through the slot 32 of the rod *d*. The result of this is that motion of the rod *d* in the direction of the arrow 34 swings the arm 27 around the spindle *a*, and the roller 5 is placed against the roller 2, as shown in Fig. 2. In this connection the pin 7, arranged on the arm 33, slides in the slot 6 and thereby lifts the lever arm 27. On the other hand, the slot 32 in the portion 31 of the rod *d* permits vertical movement of the beam 28 in accordance with the diameter of the roller 2, and the displacement of the beam 28 caused thereby.

Rising from the beam 28 is an arm 38 having a lateral extension 41 carrying a pin 40 on which is rotatably mounted a ratchet wheel 19, while pivoted to an extension 17 of the lever c is a pawl 18 which is adapted, each time the lever is raised, to engage a tooth of the ratchet wheel and rotate the same through a predetermined angle.

The ratchet wheel 19 is disposed to one side of a bill receiving housing which is composed of side walls 37 supported by the arm 38 or in any other suitable manner, and which is divided by any desired number of downwardly and inwardly inclined and converging plates 8, 8' into a corresponding number of individual bill receiving compartments, the bottoms of which are constituted by said plates, respectively. Only two such compartments formed by the plates 8, 8' are illustrated in the present instance, but as many additional compartments as may be found practical or desirable may be provided. In this connection it is pointed out that each compartment has a bill feeding mechanism related thereto and that these mechanisms are duplicates of one another. Accordingly, a description of one will suffice for all. Referring, therefore, to the mechanism related to the lowermost compartment, which has arbitrarily been selected for purpose of this description, it will first be observed that the plate 8 is provided at its sides with projections 35 and that these projections are disposed in slots 36 in the side walls 37 of the housing whereby the plate is supported between said side walls for limited longitudinal movement. It will be observed, moreover, that a spring s is connected at one end with the housing and at its other end with the plate 8 whereby said plate is urged constantly outward relative to the bill receiving band 1 and the roll 2. Further it will be observed that the plate 8 is provided near its inner end with a laterally extending pin or projection n and that a hole 12 is formed through said plate near its outer end.

Supported between the housing walls 37 above the plate 8 is a shaft 9 on which is fixed an arm 10 carrying at its free end a finger 11 which, by means of a spring or in any other suitable manner, is urged constantly outwardly and is adapted to yield inwardly. At 22 is designated a spring which tends constantly to swing the arm 10 upwardly and outwardly to a position in which the free end of the finger 11 is spaced above the plate, the arrangement in this respect being such that if a bill is resting flat on the plate 8, downward and inward movement of the arm 10 will result in the free end of the finger 11 engaging the bill and being held by the bill from entering the hole 12 in the plate, the finger under such conditions yielding inwardly and wiping across the upper face of the bill. On the other hand, the arrangement is such that if no bill is resting on the plate 8, downward and inward swinging movement of the arm 10 results in the finger 11 entering the hole 12 and imparting inward sliding movement to the plate.

Outside of the housing the shaft 9 has fixed thereto an arm 21 which is disposed in the path of movement of a circular series of pins 20 projecting from the ratchet wheel 19, each pin being adapted, by rotation of said ratchet wheel as effected by the pawl 18, to engage the arm 21 and swing the same to effect downward and inward swinging of the arm 10 and to subsequently pass by the free end of said arm 21 to release the same and the arm 10 whereby the spring 22 is permitted to return the arms to their normal positions for actuation by the next pin 20. In

this connection it is pointed out that while the angular movement imparted to the ratchet wheel 19 each time the lever c is raised is sufficient, if a pin 20 is engaged with the arm 21 at the beginning of rotation of the ratchet wheel, to swing the arms 21 and 10 through their full arcs of movement, the pins 20 are spaced apart in accordance with the number of bill receiving compartments that are provided so that any one pin 20 successively actuates the feed mechanisms of all of the compartments before the next pin is brought into position against the arm 20 to actuate this arm on the next raising of the lever C. It follows, therefore, that beginning with the lowermost feed mechanism the feed mechanisms are successively operated and that following operation of the last or uppermost mechanism the cycle starts over again beginning with the lowermost mechanism. Because of this the bills are fed successively to the band 1 from the lowermost to the uppermost compartment, and it further follows that so long as the operator continues to feed bills to the respective compartments in advance of actuation of the bill feeding mechanisms related thereto the machine will continue to operate. In other words, the present machine is as many times faster in operation than a machine having only a single bill compartment as there are compartments and related feeding mechanisms in excess of one. In this connection it is pointed out that the arms of the respective feed mechanisms corresponding to the described arm 21 are so arranged relatively to each other that as any one pin 20 completes the swinging of one of said arms it is in position to initiate swinging of the next arm immediately upon initiation of the next step in the rotation of the ratchet wheel as effected by the next raising of the lever C. Consequently, idle or wasteful motion of the mechanism is not permitted.

The finger 11 is not utilized to effect feeding of a bill resting on the plate 8. On the contrary, said finger is employed only to effect inward sliding movement of the plate 8 in the manner stated in the event of the absence of a bill from said plate, and inward movement of the plate is utilized to prevent winding of the band 1 onto the roll 2 in a manner which will later appear, feeding of the bill, when a bill is resting on the plate 8, being effected by a brush element 15 which is connected by a rod 14 with an arm 13 fixed to the shaft 9 whereby inward or feeding movement of the brush element is effected simultaneously with downward and inward swinging movement of the arm 10. In other words, the operator deposits a bill on the downwardly and inwardly inclined plate 8 while the finger 11 is in its normal raised position illustrated in Fig. 1, and the bill gravitates or is pushed until its lower or inner end portion underlies the brush 15, which brush may have its upper or outer portion normally raised slightly above the plate 8 to admit the inner end of the bill therebeneath. Accordingly, when the brush is pushed downward it serves by frictional engagement with the upper face of the bill to slide or advance the same a sufficient amount in a downward or inward direction to cause its inner end to be gripped between the roller 5 and the roll 2 whereby winding of the band 1 onto the roll 5 results in the bill being completely drawn off of the plate and wound with the band onto the roll 2. In this connection it is pointed out that the parts of the mechanism are so proportioned that the pawl 18 engages the ratchet wheel 19 and effects rotation thereof just in ad-

vance of the roller 5 reaching the position shown in Figure 2, whereby the operation as described is effected.

Referring now to the arrangement whereby downward or inward sliding movement of the plate 8 serves to prevent winding of the band 1 onto the roll 2, it will be observed that a rack bar 16 is disposed alongside the actuating rod *d* and that a bell crank lever *h* which is pivoted to said rack bar has one arm thereof constantly urged by a spring 44 into an elongated notch *e* formed in the rod *d*, said arm being disposed at the forward end of said notch when the rod *d* is in its retracted position as shown in Figure 1 so that an amount of movement of the rod *d* in an inward direction; i. e., in the direction of the arrow 34, sufficient to raise the lever *C* and to rotate the ratchet wheel 19 takes place before the outer end of the notch *e* engages the arm of said lever *h*. In this connection it will be noted that the rack bar 16 is operatively connected with the roll 2 by a pair of gears 2*a*, 2*b* and a pawl and ratchet 2*d*, 2*e*, whereby movement of the rack in the direction of the arrow 34 effects rotation of the roll 2 in a direction to wind the band 1 thereon and whereby reverse movement of the rack is ineffective to rotate the roll 2. Also, in this connection it will be observed that it is only continued inward movement of the rod *d*, after the ratchet wheel 19 has been rotated to advance the inner end of a bill between the roll 2 and the roller 5, and after the outer end of the notch *e* has engaged the arm of the lever *h*, which produces inward movement of the rack bar 16, whereby rotation of the roll 2 to wind the band 1 thereon is effected subsequent to feeding of the bill into a position to be wound with the band onto said roll 2.

The other arm of the lever *h* is provided with a pin 26 which is disposed in an elongated slot 25 in a rod 24 so that under normal conditions; i. e., as long as the bill supporting plates of the feed compartments remain in their outer positions, said pin rides freely in said slot and the first mentioned arm of the lever remains in the notch *h* whereby the rack bar is retracted with the actuating rod *d*.

When the rack bar 16 is in its retracted position the pin 26 of the lever *h* is disposed substantially at the outer end of the slot 25 in the rod 24. Consequently, if this rod is moved to the right as viewed in Figure 1 the wall defining the outer end of the slot will engage the pin 26 and swing the lever *h* to disengage its first mentioned end from the notch *e* whereby inward movement of the actuating rod *d* will be ineffective to impart inward movement to the rack bar, and obviously under such conditions no rotation of the roll 2 will occur.

At 23 is designated a lever which is pivoted intermediate its ends, as at 42, and which has its upper arm disposed in the path of movement of the pin or projection *n* of the plate 8, whereby inward sliding movement of said plate results in engagement of the pin *n* with the upper arm of said lever 23 to swing said lever in a clockwise direction as viewed in Figure 1. The inner end of the rod 24 is connected with the lower arm of said lever 23. Consequently, when said lever is rotated in a clockwise direction the rod 24 is moved inwardly and acts to disengage the lever *h* from the notch *e* of the actuating rod *d*. It follows, therefore, that in the absence of a bill from the plate 8 reciprocation of the rod *d* will simply result in raising and lowering of the lever *C* and

idle step by step advance of the ratchet wheel 19, as the plate 8 will be moved inward by the lever arm 10 each time the lever *C* is raised to disconnect the rod *d* from the rack bar 16.

At *i* is designated a pawl which is carried by the rack bar 16 and which is arranged to actuate through a ratchet wheel *k* to advance a counting device designated as *l* one unit each time the rack bar is moved inwardly. In this way the total number of bills that are wound on the roll 2 is accurately indicated.

I claim:

1. In apparatus for receiving and issuing paper bills, bill holding means, a plurality of devices for receiving and directing bills to said bill holding means, means for feeding successive bills to said bill holding means from successive guides, and means operable in the absence of a bill from the device from which a bill should be fed to render the bill holding means ineffective to receive a bill.
2. In apparatus for receiving and issuing paper bills, bill holding means movable to receive the bills, a plurality of devices for receiving and directing bills to said bill holding means, means for feeding successive bills to said bill holding means from successive devices, and means operable in the absence of a bill from the device from which a bill should be fed to prevent movement of the bill holding means to receive a bill.
3. In apparatus for receiving and issuing paper bills, bill holding means movable to receive the bills, a plurality of devices for receiving and directing bills to said bill holding means, means for feeding successive bills to said bill holding means from successive devices, a bill feeler individual to each device, and means whereby each bill feeler is effective to prevent bill receiving movement of the bill holding means in the absence of a bill from the device from which a bill should be fed.
4. In apparatus for receiving and issuing paper bills, bill holding means movable to receive the bills, means for imparting bill receiving movement to the bill holding means, a plurality of devices for receiving and directing bills to said bill holding means, means for feeding bills from successive devices to said bill holding means, each device including a slidably mounted bill supporting plate having an aperture, a pivoted bill feeler individual to each device, means for imparting pivotal movement to the feelers successively, each feeler having a spring pressed element to be projected by pivotal movement of the feeler into the aperture of the related bill supporting plate in the absence of a bill from said plate thus to shift the plate and to be held from projection into said aperture by the presence of a bill on the plate, and means whereby sliding of any given plate by its related feeler renders the means for moving the bill holding means ineffective to move the latter means.
5. In apparatus for receiving and issuing paper bills, bill holding means movable to receive the bills, a plurality of devices for receiving and directing bills to said bill holding means, means for feeding bills from successive devices to said bill holding means, an operating member for the bill holder, a releasable connection between said operating means and the bill holder, and means operable in the absence of a bill from a device from which a bill should be fed to release said connection.

SIEGMUND CHIGER.