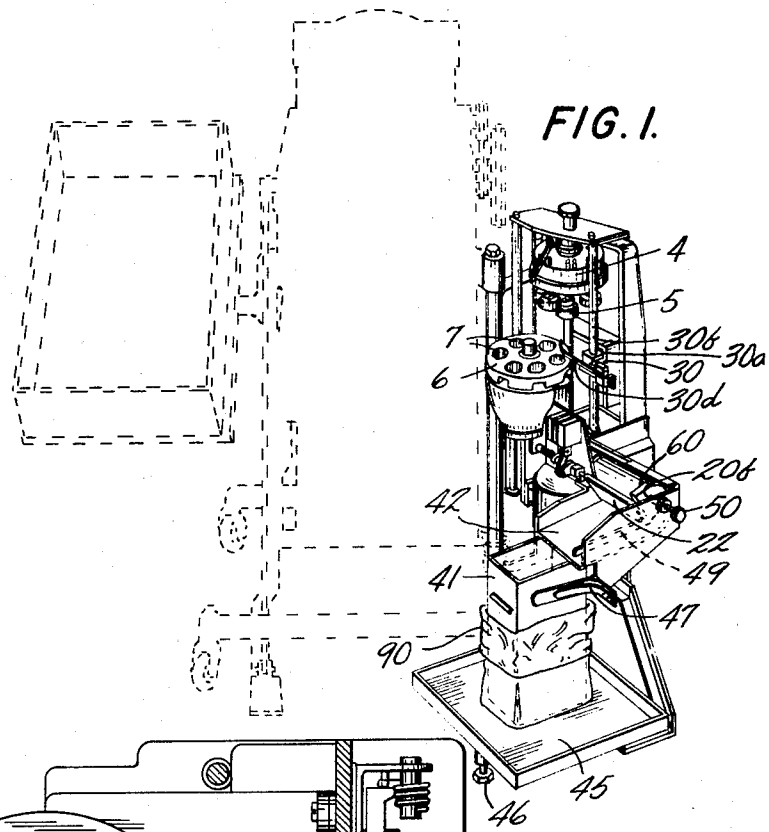
May 3, 1960 R. A. WATTS 2,934,871

PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

Filed March 10, 1958 3 Sheets-Sheet 1

FIG. 1.



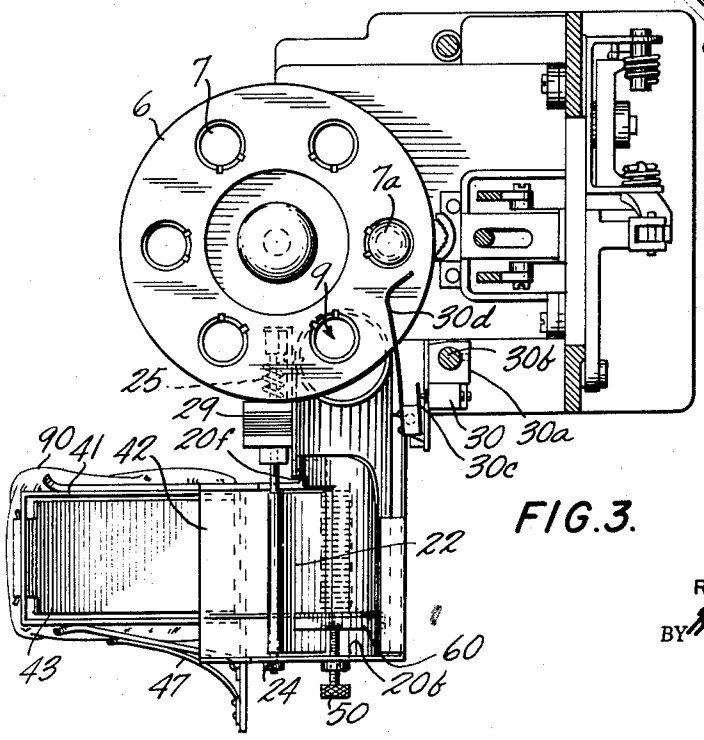


FIG. 3.

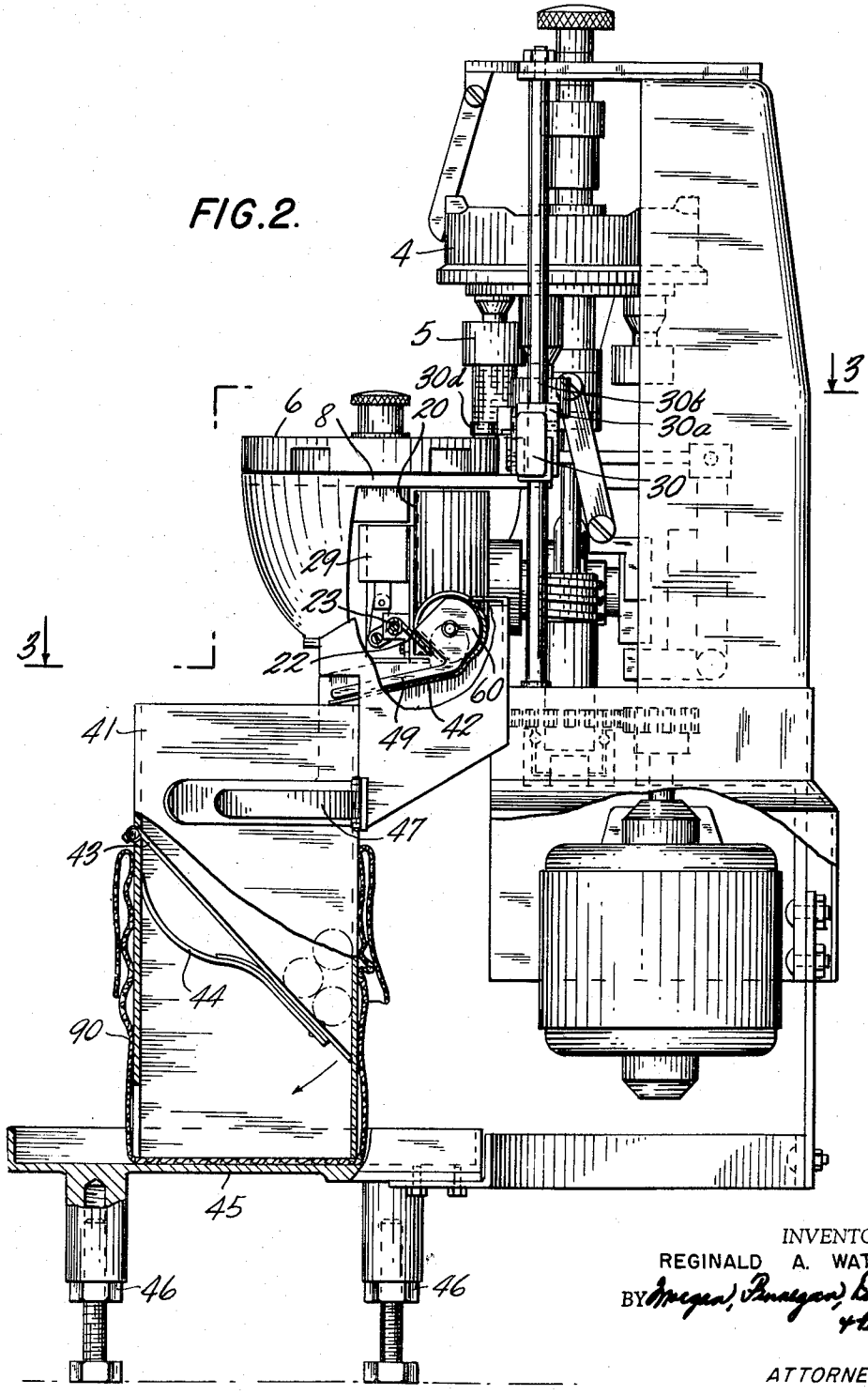
INVENTOR.
REGINALD A. WATTS
BY Morgan, Finnegan, Durham & Pine
ATTORNEYS.

May 3, 1960 R. A. WATTS 2,934,871

PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

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FIG. 2.



INVENTOR.
REGINALD A. WATTS
BY Morgan, Finnegan, Durham & Pine
ATTORNEYS.

May 3, 1960 R. A. WATTS 2,934,871

PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

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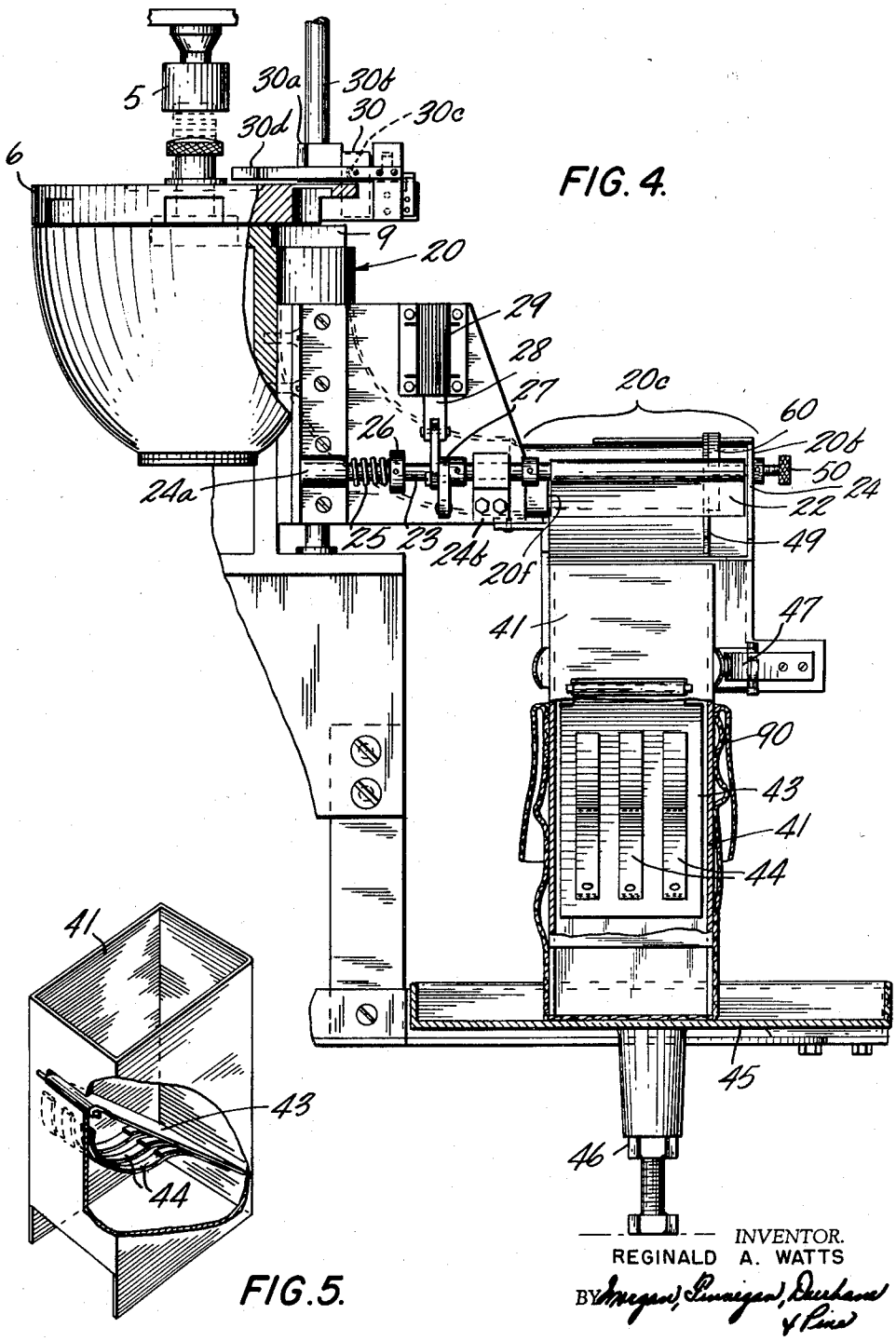


FIG. 4.

FIG. 5.

INVENTOR.
REGINALD A. WATTS
BY Morgan, Finnegan, Durham & Pine

ATTORNEYS.

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2,934,871

PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

Reginald A. Watts, Fort Lee, N.J., assignor to Automatic Coinwrapping Machine Corporation, New York, N.Y., a corporation of New York

Application March 10, 1958, Serial No. 720,356

4 Claims. (Cl. 53—248)

This invention relates to collecting packages of coins from machines handling coin packages, such for example as machines which automatically or semi-automatically count and package coins in rolls. It particularly relates to the formation of a group of packages of coins in an orderly shape in bags or containers.

Heretofore in order to dispose coin packages in a more or less orderly manner in bags or other containers, it has been customary for the operator of the coin packaging machine to arrange the packages by hand; for example place them side by side parallel to each other. In addition, mechanical methods have been devised for the orderly disposition of coin packages. One such method is to provide the coin handling machine with a trough having a horizontal opening to permit the escape of each coin package sidewise one by one from the trough to roll onto an inclined tray by force of gravity to form horizontal parallel layers. Control of the seriatim dropping of the individual coin packages is achieved by a movable gate on the trough which is opened and closed by other portions of the coin handling machine. With such inclined tray devices, the tray is lowered by springs and the like as the parallel layers accumulate—one layer resting on the preceding layer.

The above practices have been found unsatisfactory. The manual method of arranging coin packages is laborious and expensive. The mechanical inclined tray method, on the other hand, requires a substantial and excessive amount of space to accomodate the tray. In addition, the mechanical stacking of the packages often is unsuccessful because succeeding coin packages must roll over preceding layers and slight error in alignment or incline of the tray or in the functioning of the tray support springs frequently cause the packages to bunch up, become disorderly arranged, or miss the tray entirely. Moreover, when the tray is successfully loaded with coin packages, the packages must be transferred laboriously into a bag or container and such transfer often upsets the stack formation. Further, the mechanism necessary to control the seriatim formation of the packages on the tray did not provide an accurate count of the packages. The coin packaging machine operator, therefore, must maintain a count of the packages forming on the tray despite the other mechanized features of the operation.

The above difficulties are obviated by the present invention which collects the packages in an orderly stack vertically disposed in a small space. The structure of the invention is simple and inexpensive but nevertheless stacks the coin packages in many layers with great certainty. Further, the invention accurately counts each of the packages stacked without regard to any additional operations being performed by the machine. Still further, the invention directly stacks the formation of coin packages in the final container or bag so that no further transfer is necessary.

Briefly, this is accomplished by providing, in combination, a coin handling machine having a horizontal opening to deliver coin packages sideways one by one. A hollow collecting chute, of rectangular cross-section, is vertically disposed and positioned with one side wall adjacent and parallel to the horizontal opening of the machine to receive the coin packages. The chute contains an internal ramp which is downwardly inclined. The ramp is pivotally mounted at its upper end for swinging movement of the lower end to and from a position in contact with a side wall of the chute to open and close the bottom of the chute to passage of coin packages to the bottom of the chute. The lower end of the ramp is normally urged upwardly by a spring or other resilient means into closed position.

With this arrangement, the coin packages delivered by the horizontal opening of the machine drop by gravity one by one onto the ramp of the chute and are stacked thereon in parallel alignment confined by the outer side walls of the chute until a number of them aggregate a weight sufficient to depress the resilient means. The ramp then opens and the packages drop into the bottom of the chute en masse. The mass of the coin packages retain their desired stacking conformation at the bottom of the chute.

A flexible arm of particular shape to provide a predetermined period of contact with a coin package approaching the gate is resiliently held in position in the path of the coin packages to actuate an electric circuit upon displacement of the arm by a coin package approaching the gate; and, the actuated circuit energizes electrical means which open the gate for a pre-determined time interval sufficient to permit the escape of the package, and the respective openings of the gate being registered upon a counting meter, thereby furnishing an accurate count of each of the packages stacked.

More preferably, the actuated circuit energizes electrical means which causes the registration of the package upon a counting device, thereby furnishing an accurate count of each of the packages stacked.

Preferably, the ramp of the chute is downwardly inclined toward the side wall of the chute adjacent the horizontal opening of the machine so that each coin package rolls down the ramp in parallel alignment with the coin package which preceded it. Still more preferably, the chute is open bottomed and a bag or other container of dimensions only slightly larger than the chute is placed around the bottom and sides of the chute. With this arrangement, after the chute is loaded with coin packages, the operator need merely slide the chute upwardly and out of the bag or other container; and, all of the coin packages will thereby be left in the final container in the desired orderly shaped stack for transportation elsewhere. The chute is then replaced in its position adjacent the horizontal opening of the machine for another load.

The foregoing and other matters of the invention are illustrated in the accompanying drawings which show an illustrative embodiment of the invention which I prefer.

Figure 1 is a front elevation of a well-known coin packaging, loading and crimping machine with a device added to it in accordance with the invention, the coin packaging portion of the machine being shown only in dotted lines because the details thereof are not necessary to an understanding of the present invention;

Figure 2 is a side elevation, partly in section, of the package collecting mechanism and the immediately related portion of the coin loading and crimping machine of Figure 1;

Figure 3 is a sectional view on the line III—III of Figure 2, looking in the direction of the arrows;

Figure 4 is a detail showing the horizontal opening of the coin handling machine including the trough on which

the packages slide to the opening, the gate and the gate operating mechanism, and the collecting device in accordance with the invention; and

Figure 5 is a perspective view, with a portion partly broken away and in section, of the chute of the invention.

Speaking generally and as before indicated, the function and nature of the machine handling the coin packages is not wholly material to the present invention and primarily the coin counting, packaging and loading machine, shown in the accompanying drawings is intended to be representative of the coin handling machines to which the invention is applicable. Briefly, the machine represented in the drawings consists of a power driven mechanism which has a hopper into which a mass of coins of one denomination, say pennies, dimes, nickels, quarters or half-dollars, is poured. Under the control of the operator, the machine delivers these coins one by one and counted into lots of desired numbers, as say fifty pennies or forty nickels, etc. to a particular position. The operator selects from a stack of paper tubes, each closed at one end and open at the other, a tube of a size appropriate for the size of coin being handled at the moment, and then brings the tube by hand to the position of delivery to receive and be loaded with the lot of coins from the coin counting mechanism. These portions of the coin handling machine just described are schematically represented by the dotted lines of Figure 1. At the opposite side of the machine (shown in full lines at Fig. 1), a crimping mechanism is provided for crimping the open ends of the loaded tubes of coins. In the instance illustrated, this crimping mechanism consists of a movable member **4** which carries a number of power driven crimper cups **5**, one appropriate to each size of coin that the machine is adapted to handle, the appropriate cup being selected and rotated to the crimping station by the operator, and a movable member **6** which transports each of the loaded paper tubes placed thereon by the operator to the appropriate crimping station and thence to the machine outlet **9**. The movable member **6** is a disc which is pierced with holes **7** to hold the individual tubes vertically while they rest on plate **8**. The base plate **8** has an opening at **9** (Figure 4). After the tube loaded with coins has been crimped, movable member **6** moves its clockwise (Figure 3) to opening **9**, through which outlet the tube falls endwise. Movable member **6** rotates automatically by power under the operator's control step by step, each step being equal to the distance between each two adjacent holes **7**, and each hole coming to rest at the position of hole **7***a* in Figure 3 which is the crimping station. Thereby, the tubes are successively crimped and discharged.

An inclined trough **20** is positioned with its upper end located underneath the outlet **9** to receive each of the crimped tubes of coin as the tubes fall through outlet **9**. The rolls or tubes of coin slide down the trough **20** by gravity to the far end **20***b* of the trough which is disposed horizontally throughout the distance marked **20***c*. The movable end wall **60** closes the end of the trough. Throughout the horizontally disposed portion **20***c* of the trough, there is continuity of the back wall of the trough but the front portion of the trough is cut out beginning at **20***f* to provide an opening long enough to permit coin packages of the largest size to escape sideways from the trough and in a direction at right angles to its length. Extending across this open space in the trough walls, however, is a gate **22** which is carried on and attached to a shaft **23** mounted to rotate in brackets **24**, **24***a* and **24***b* affixed to parts of the structure. A spring **25**, fastened at one end to the bracket **24***a* and at its opposite end to a collar **26** fastened to shaft **23**, tends to hold the gate **22** closed (position in Figure 2) in which position coin rolls are prevented from leaving the trough. An arm **27** fastened to the shaft **23** and linked to the armature **28** of a solenoid **29** (Figure 4), and a switch at **30** (Figure 3) in the line supplying power to the solenoid **29** provide for opening the gate. Closing the switch **30** energizes solenoid **29** and thereby swings the gate on shaft **23** (Figure 2) for the discharge of any coin roll that is resting in the trough **20**, while opening the switch **30** permits the spring **25** to close the gate and thereafter hold it closed against any coin package that may come to rest against the gate until switch **30** is closed again.

As before indicated, it is desirable that the coin package come to a position fully opposite the gate and be at rest before being allowed to pass out through the opening in the trough. This is particularly important because the coin packages are discharged by gravity, and if the gate opens prematurely, the package will roll out on a longitudinal axis non-parallel to the chute. Conversely, the gate should not prematurely close to jam a package thereunder.

In the preferred embodiment illustrated in the drawings, the switch **30** is a micro-switch of the self-opening type. It is mounted on a block **30***a* by means of tie rod **30***b* on the crimper head. Fastened to the micro-switch **30** is a micro-switch trigger **30***c* that is connected electrically to a long resilient trigger arm **30***d*. Preferably, the trigger arm **30***d* is made of spring steel. It is mounted at one end adjacent switch trigger **30***c*. Its free end extends over movable crimper member **6** closely adjacent to outlet **9** on the approach side thereof. The free end is particularly and specially curved toward the edge of plate **6**, to maintain a continued contact for a pre-determined period with the coin package in opening **7** and is carefully positioned astride the path of movement of the outer radial half of the holes **7**, i.e., the free end of trigger arm **30***d* does not extend toward the center of the crimper head beyond the path of movement of the centers of holes **7**.

Thus, the trigger arm **30***d* contacts any coin package in opening **7**, regardless of variations of denomination of coin, continuously from the moment of initial abutment to just prior to the time that the coin package drops through outlet **9** into trough **20**, and, during such period of contact, the trigger **30***c* actuates micro-switch **30** which, through energization of solenoid **29** and actuation of the related levers connected thereto, opens and holds open gate **22** for the exact pre-selected time interval. This interval is selected to cause the gate to remain open sufficiently long to permit clear passage thereunder of the coin package previously at rest in the horizontally disposed portion **20***c* of the trough and to cause the gate to close in time to prevent the premature escape of the coin package then entering the trough. That is to say, the switch **30**, the switch trigger **30***c* and the resilient trigger arm **30***d* can be so located and trigger arm **30***d* so specially shaped that a coin package in hole **7** approaching outlet **9** acts on trigger arm **30***d* to hold the switch **30** closed, while the entry of the coin package into outlet **9** removes the pressure from trigger **30***c* and allows the switch **30** to open. As a result, switch **30** is open and gate **22** is closed whenever a package may be passing through outlet **9** and a little time thereafter. But after a package passing from the outlet has had time to settle and come to rest in the horizontal portion **20***c* of the trough, the subsequent advance of another coin package in member **6** to contact with trigger arm **30***d* causes gate **22** to open and permit the escape of the first package then in the portion **20***c* of the trough.

With the above arrangement, the gate **22** is closed at all times except when a package has passed through the outlet **9** and assumed a position of horizontal rest in the trough. Movement of the crimper plate member **6** or other movements of related parts of the machine have no effect whatsoever on the activation of the gate except when a coin package is moved to outlet **9**. A common mechanism, therefore, can be connected to the gate or to the trigger arm which will accurately supply a count of actual packages passing through the trough for collec-

tion. Any conventional counting mechanism is satisfactory for this purpose.

As shown in Figure 1, trough 20 has an extending lip 42 which is slightly downwardly inclined beyond gate 22 upon which the packages of coin roll when passing through the gate. A chute 41 is placed just beneath the lip. As shown in Figure 5, the chute is of a rigid hollow box like construction having a rectangular cross section with four side walls, and the chute is positioned with a side wall adjacent the lip parallel to trough 20. It has an open top and preferably has an open bottom. Mounted within the chute is a downwardly inclined ramp 43 pivotally mounted at its upper end to the side wall most distant from the lip. The lower end of the ramp 43 is movable from a position in contact with the opposite side wall of the chute (the side wall adjacent the lip) to a position removed from said side wall, as shown by the arrow at Figure 2, so as to open a passage to the bottom portion of the chute. The lower end of the ramp is urged upwardly by springs 44 into contact with the side wall.

For convenience in operation, the machine itself is provided with attached base plate 45 which can be adjusted vertically by nuts 46 to support the chute in position directly underneath and in contact with lip 42. In addition, clamps 47 are provided to position the chute firmly on the base plate to prevent shifting or movement of the chute during the loading operation.

The machine is also provided with a guide arm 49 which is mounted on the end wall 60 of the trough to lie on the lip 42. This guide arm is adjustable by means of nut 50 for movement along the trough wall and on the lip. By moving this guide arm to an appropriate position, a single roll, long or short, can be stopped with its middle exactly opposite the middle of the chute and the guide arm will act to guide the package as it rolls down the lip to drop squarely into the chute.

As shown in the preferred illustration, a relatively tight fitting bag or box or other final container 90 is fitted around the bottom and side walls of the chute 41.

As the rolls are delivered one by one in the arrangement described, they pass through the gate 22, roll down the lip 42 and fall by the force of gravity into the chute where they come to rest squarely upon the ramp. Many of the packages will reach the ramp near its upper end and roll downwardly until they come to rest whereas others may drop directly to the bottom of the ramp. In either event, the rectangular cross section of the chute and the inclined disposition of the surface area of the ramp will orient misaligned rolls to make them squarely collect one on top of each other (see Figure 2 for three such rolls) with their axis in parallel alignment. After a number of the rolls have been collected in this fashion, their combined weight will be enough to depress the ramp and they will fall to the bottom of the chute and come to rest upon the final container. The ramp will then move upwardly under the urging of the spring until it resumes its closed position. The process is complete when the chute is completely full.

It should be noted that after rolls accumulated in the bottom of the chute aggregate a height as high as the ramp, that the ramp will no longer depress. However, this does not affect the orderly stacking of the rolls of coin. The packages nevertheless collect in a substantially squared fashion until the chute is filled.

The operator then removes the chute with the final container from the clamps. The chute is clasped firmly and removed from the container. This causes all the rolls of coins to be left exactly in stacked conformation within the container—any of the packages still out of square because slightly above the ramp roll downwardly over the ramp into squared position. Another container is then placed around the bottom and lower portions of the chute and it is placed upon the base plate and within the clamps for another loading operation.

Since minor departures can be made from the foregoing form of the invention illustrated in the drawings without departing from the substance of the invention, it should be understood that the form of the invention described and illustrated above is illustrative only except as expressly limited in the claims set forth below.

I claim:

1. The combination of a coin handling machine having a horizontal opening to deliver coin packages sidewise one by one with an open collecting chute vertically disposed and positioned adjacent the opening to receive the coin packages, the chute having a rectangular cross section, the chute having a downwardly inclined ramp pivotally mounted at its upper end on one side wall within the chute for movement of the lower end of the ramp from a position abutting the opposite side wall to a position away from said opposite side wall to provide access to the bottom of the chute, the lower end of the ramp being urged upwardly by resilient means to contact said opposite side wall of the chute.

2. The subject matter of claim 1 characterized by the fact that the upper end of the ramp is pivotally mounted to the side wall of the chute most distant from the horizontal opening of the machine.

3. The subject matter of claim 1 characterized by the fact that the chute has an open bottom and the combination includes a closely fitting container disposed around the bottom and lower side portions of the chute from which the chute is removable.

4. The subject matter of claim 1 including in the combination a trough on the machine to guide the coin packages to the horizontal opening and electrical means positioned adjacent the trough to engage a coin package as it passes into the trough to be actuated thereby, and a gate on the opening connected with the electrical means to open and close in response to the electrical means.

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