July 24, 1956 F. W. SCHOENEWOLF 2,755,978

PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

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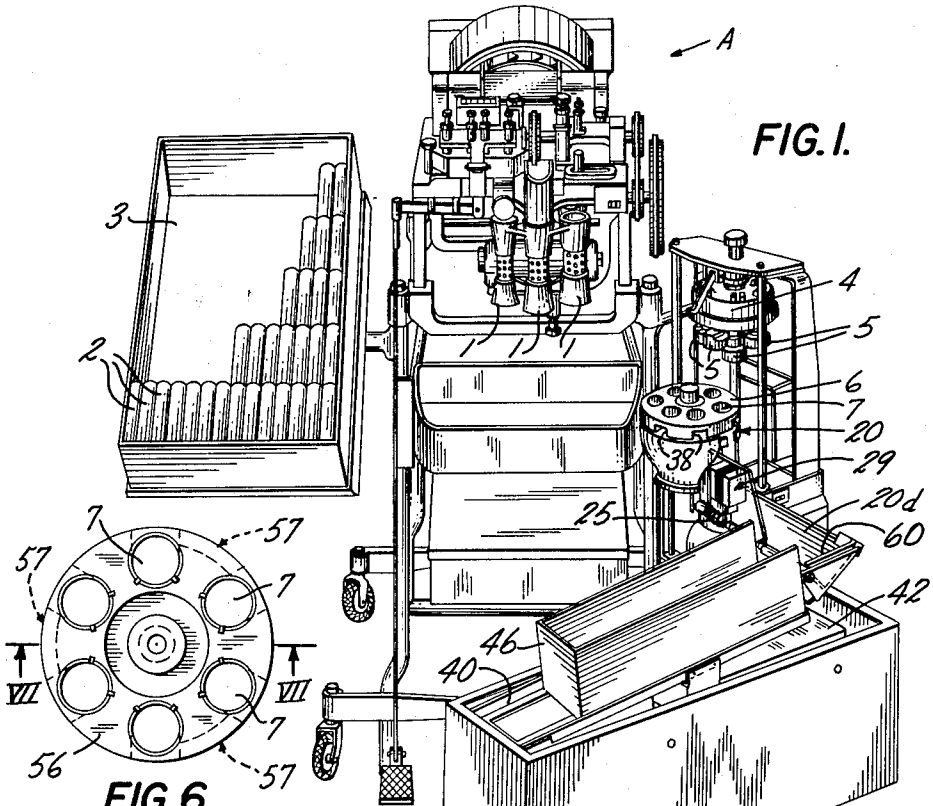


FIG. 1.

FIG. 6.



FIG. 7.

FIG. 3.

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FIG. 4.

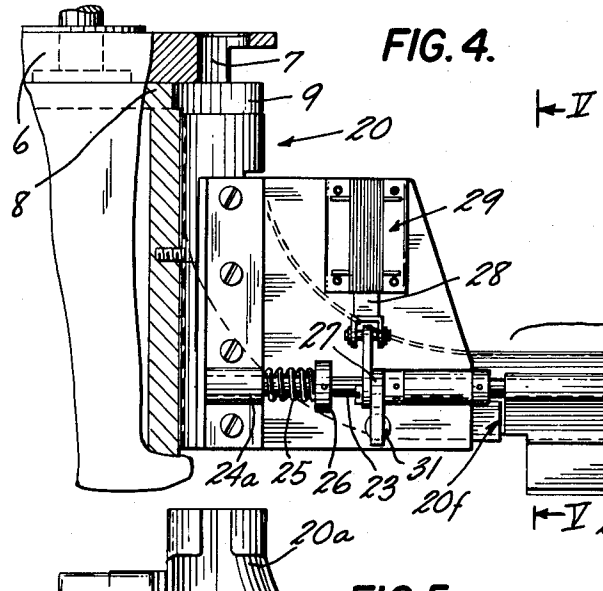


FIG. 5.

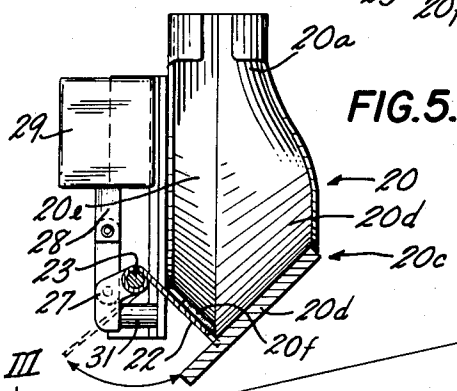


FIG. 2.

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PACKAGE COLLECTOR FOR COIN PACKAGE MACHINE

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10 Claims. (Cl. 53—244)

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 pacakage coins in rolls.

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 machine to arrange the packages by hand; for example place them side by side parallel to each other. The present invention provides for doing this mechanically.

To this end, briefly, I provide the coin handling machine with an inclined conveyor, which may consist of a trough along which the packages can pass by gravity, and I locate the upper portion of the conveyor adjacent the outlet from the machine and dispose the lower end of the conveyor substantially horizontally. This lower end of the conveyor is opened or ported to permit movement of coin packages therefrom sidewise, at least by preference, and a movable gate is provided to prevent the escape of packages from this horizontal portion of the conveyor until a package or packages arriving thereat has or have arrived fully opposite the port from the conveyor and preferably has or have come substantially to rest in a horizontal position. The operation of the gate can be timed by putting it under the control of the coin packages or by timing it with associated apparatus. However this may be done, the result is that each package may leave the conveyor substantially in the path of the packages preceding it as it were, and preferably at least in a direction at right angles to its length and quite parallel to the packages which preceded and those which follow later. At the opening of the conveyor a tray is located to receive the packages from the conveyor, and as a result of the orderly manner in which the packages leave the conveyor and pass onto the tray, they are moved readily toward the opposite end of the tray and arranged parallel to each other and in one or more layers. To move the packages along the tray, the bottom of the tray may be inclined downwardly so that the packages move to their assigned places in the tray by gravity. Preferably a carrier is provided to support the tray and lower the tray as packages are added to the tray, so that as one layer of packages is completed, the following packages pass on to the completed layer and build up another. The tray may be removable from the carrier, and it may be the permanent container as it were for the packages collected in it or it may be only as intermediate holder from which the packages can be dumped into a bag or other container without substantially losing their parallel relations as will be understood from prior practices.

The foregoing and other matters of the invention are illustrated in the accompanying drawings which show the form of the invention which I prefer at present: Fig. 1 is a front elevation of a well known coin counting and packaging machine with a collective device added to it in accordance with the invention. Fig. 2 is a sectional side elevation of the collecting mechanism and

the immediately related portion of the coin package machine of Fig. 1. Fig. 3 is a sectional view about on the line III—III of Fig. 2, looking in the direction of the arrows. Fig. 4 is a detail of the trough through which the packages slide from the outlet of the coin package machine, the gate and the gate operating mechanism. Fig. 5 is a section about on the line V—V of Fig. 4. Fig. 6 is a plan view of an alternative form of the member of the coin package machine which transports the completed packages to the outlet of the machine. Fig. 7 is a section on the line VII—VII of Fig. 6.

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 and packaging machine shown in the accompanying drawings (which is a well known one as will be recognized) is intended to be representative of the coin handling machines to which the invention is applicable. Briefly this machine shown in the drawings consists of a power driven mechanism, represented generally at A, which has a hopper into which a mass of coins of one denomination, say pennies, dimes, nickels, quarters or half dollars, is dumped, and which, under the control of the operator, delivers these coins one by one and counted into lots of say fifty pennies, or forty nickels, etc., and delivers them through that one of the tubes 1 which is appropriate to the size of the coin being handled at the moment. A stock of paper tubes 2, each closed at one end and open at the other and of a size appropriate for the size of coin being handled at the moment, is carried in a box 3 hung on the machine convenient to one hand of the operator. At the opposite side of the machine a crimping mechanism is provided for crimping the open ends of these tubes when loaded with a counted number of coins. In the instance illustrated this crimping mechanism consists of a member 4 carrying a number of power driven crimper heads 5, one appropriate to each size of coin that the machine is adapted to handle, and a movable member 6 to transport the loaded paper tubes to the appropriate crimper head and thence to the outlet from the machine. Here the movable member 6 is a disc pierced with holes 7 appropriate for holding individual tubes 2 vertically and resting on a base plate 8 which prevents the tubes falling through the perforations 7 except at one place where the base plate 8 is pierced with an opening 9. As any tube loaded with coins and crimped at its formerly open end reaches this opening 9, it falls therethrough, endwise, from the machine. The opening 9 is the machine outlet. Under manual control by the operator the movable or transporting member 6 is rotated step by step by power, the angular length of each step being equal to the angular distance between each two adjacent holes 7 and each hole coming to rest at the position of the hole 7*a* in Fig. 3. This hole 7*a* is at the crimping station where the packages are crimped successively.

Preliminary to operating this machine with any particular size of coin, that tube 1 which is of a size appropriate to coins of that size is brought by hand to position to receive coins from the counting mechanism; also by hand the crimper head member 4 is rotated as necessary to place the crimper head 5 of corresponding size at the crimping station, i. e. directly above the package-carrying hole 7*a* of the movable member 6 in Fig. 3. Then to operate the machine, the operator takes one of the tubes 2 and holds it, open end up, underneath the delivery tube 1, and by an appropriate control starts the counting. The machine having counted out and into the tube 2 the appropriate load, it automatically stops delivering coins and the operator sets the loaded tube in one of the openings 7 of the disc 6 and by a, say, second control causes the member 6 to advance a step and also (as the

disc 6 comes to rest again) causes the crimper head 5 which is at the 7a position to crimp the open end of any tube that may be standing at the 7a position. As successive tubes 2 are filled and set in the movable member or disc 6 in this manner, the first and each succeeding tube is crimped, and as each passes from the crimping station and comes to the outlet 9, it falls through this outlet endwise.

In accordance with the present invention an inclined trough 20 is provided through which the filled coin rolls can slide endwise. The upper end 20a of this trough is located underneath the outlet 9 from the machine and its upper portion is inclined sufficiently (see Fig. 4) to enable the coin rolls, coming into the upper end of the trough endwise, to slide down the trough 20 by gravity to say, the far end 20b of the trough. The lower portion of the trough, i. e. the portion spanned by the bracket 20c in Fig. 4, is disposed horizontally, and while one wall 20d of the trough is continued to the end 20b of the trough, the other wall 20e is cut short, as it were, at about 20f, Fig. 4. An end wall or abutment 60 prevents the escape of coin packages from this end of the trough. The end 20f of the trough wall 20e is spaced from the end wall or abutment 60 a distance at least a little greater than the length of the longest coin package to be handled by the machine and thereby is provided an opening in one side of the trough, as it were, from 20f to 20g, through which a coin package coming down endwise from the upper end 20a of the trough and assuming a horizontal position in the region 20c, can escape sidewise 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 24a fastened to fixed parts of the structure. A spring 25, fastened at one end to the bracket 24a and at its opposite end to a collar 26 fastened to shaft 23, tends to hold the gate 22 closed (position in Fig. 5), 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 (Fig. 4), and a switch at 30 in the line supplying power to the solenoid 29, provide for opening the gate, i. e. swinging it to its dotted line position in Fig. 5. That is to say, closing the switch 30 energizes the solenoid 29 and thereby swings the gate open for the discharge of any coin roll or coin rolls that may be resting in the trough 20 and against the gate 22, while opening the switch 30 allows the spring 25 to close the gate and hold it closed against any coin package or packages that may come to rest against the gate until the switch 30 is closed again. A pin 31, extending from the bracket-plate which carries the solenoid 29 and gate shaft 23, is engageable by the operating arm 27, in its downward movements, to stop the closing movement of the gate at a position where the gate is located a little farther from the trough wall 20d than the end 20f of the opposite trough 20e; thereby the end 20f acts as a stop to limit the backward movement of any coin package that may rebound from the trough end wall or abutment 60.

As before indicated, it is desirable that the coin packages at least come to fully opposite the escape port of the conveyor, and preferably come to rest horizontally or substantially so, before being allowed to pass out of the lower end of the conveyor. This is especially the case where the coin packages are to move sidewise out of the conveyor by gravity to their places in a receptacle for them, such as a tray in which they are collected. This can be done by properly timing the operation of the gate switch 30. Rather than securing this timing by putting the switch 30 under the control of, say, coin packages in the conveyor, I prefer to associate the switch with some moving part of the package machine, and most preferably with the movable package-transporting member 6 or a corresponding part. Also preferably, in cases where the packages escape from the package machine as they do through the port 9, the timing is such that the gate 22 is held closed while the machine outlet 9 is open for the passage of packages through it (e. g. disc 6 positioned with one of the holes 7 over 9), or substantially so, and is open, or operable to open, while packages are being moved toward the outlet 9, or substantially during such periods. In the instance illustrated, the switch 30 is of the self-opening type, for convenience of construction a bell-crank 35 is interposed between the edge of the disc 6 and the operating member of the switch 30, and the edge of the disc 6 is given such a cam shape, as it were, that, acting through the bell-crank 35, the disc 6 allows the switch 30 to stand open whenever the disc is at rest with one of the holes 7 standing over the outlet 9 (Fig. 3) but holds the switch 30 closed while the disc is rotating to bring another hole 7 to the outlet 9. The disc 6 can be given a special shape in order that it may operate in this way. In the present instance however, the disc 6 has a radial passage 38 leading into each package hole or perforation 7, Figs. 1 and 3, through which packages are clamped during crimping, and these give the edge of the disc a sufficient cam-shape, as it were, for the present purposes. That is to say the switch 30 can be so located that the sections of the edge of disc 6 between radial passages 38 act on bell-crank 35 to hold the switch 30 closed when it should be closed, while the appearance of a radial passage 38 at the bell-crank 35 allows the switch 30 to open. As a result switch 30 is open, and therefore the gate 22 is closed, whenever a package may be passing through the outlet 9 of the machine and a little time thereafter, but after a package passing from the outlet has had time to settle down the horizontal portion 20c of the trough, the subsequent advance of the transporting member 6 another step causes the gate 22 to open and permit the escape of any coin package or packages that may be in the trough at the moment.

At the gate side of the trough a carrier is provided for a tray to receive and collect the coin packages leaving the trough. Primarily this carrier comprises a platform 40 on which the tray rests, two levers 41 and 42 hinged respectively to extensions from the platform at 43 and 44 and coupled together for synchronous movement by a bar 45 hinged to each of the levers 41 and 42 and so related that the system constitutes a parallel motion, i. e. a mechanism, which, while permitting the platform to rise and fall, always holds the platform parallel to its initial plane. This plane may be taken as the plane of the top of the platform 40 when in its highest position, and as shown may be inclined downwardly from the trough (see Fig. 2) to such an extent that a roll of coins delivered into the tray from the trough runs toward the opposite end of the tray. The tray is illustrated at 46 in Figs. 2 and 3. It consists of a bottom, two vertical side walls and an end wall closing the lower end of the tray. The open and upper end of the tray, when resting on the platform in the initial position, is disposed adjacent and either on a level with or a little below the lower edge of the side wall 20d of the trough (Fig. 3) so that a coin roll escaping from 20d falls into the tray. When the platform 40 is made long enough to carry trays of different lengths, as in Fig. 2 for example, one or more stops 48 may be provided to set into the platform at appropriate places to keep short trays from sliding down the platform. Inasmuch as the rolls are delivered one by one in the arrangement being described the width of the tray 46 is a little greater than the length of one roll, so that the rolls of coins run downwardly in it easily. A spring 47, mounted at one end of 47a on the fixed structure and at its other end 47b bearing against the lever 41, tends to hold the platform in its upper, Fig. 3, position. However this spring (or two or more, say successively operating, springs that may be substituted for it) has such a characteristic that the addition of coin rolls to the tray 46, by their weight, forces platform 40 and thereby the tray downwardly to such an extent that when the first

layer of coin rolls is completed (i. e. the layer shown partly completed in Fig. 2), the tray has fallen sufficiently to permit the next coin roll coming from the trough to pass onto the first layer and thus start a second layer. Similarly, when the second layer is completed, the tray may have fallen sufficiently to allow a third layer to be started, and so on to the extent that may be desired. The tray 46 may rest on the platform 40 merely by its own weight so that when filled it can be removed readily for emptying, or to permit another to be substituted for it.

The floor of any tray may be a plane surface. Preferably however I corrugate the floor of each tray, or provide it with a corrugated covering, in which the hills and valleys extend across the tray, Figs. 2 and 3, and the hills are of such height and are so shaped and spaced from each other that the corrugated floor more or less resembles the top of a layer of the coin rolls being handled at the moment. Such corrugation seems to help in causing the rolls to remain at right angles to the length of the tray when rolling down the bottom of a tray.

With the transporting member 6 shown in Fig. 2, it is evident that the coin rolls coming down the trough will leave the trough one by one and enter the tray one by one. This is not altogether essential however. I. e. two or more rolls, arranged end to end, may be delivered by the trough at a time and thereby two or more rows of rolls built up at a time. Fig. 6 shows at 56 how a transporting member can be made to deliver a plurality of rolls at a time from the trough. All that is necessary is to so cam the edge of the member that the gate is allowed to open only after the desired number of rolls have passed the outlet 9. Thus in the example of Fig. 6, which is arranged to deliver the coin rolls in pairs, the edge of the member 56 is cut away as at 57 between members of pairs of the pockets 7 so that the bell-crank 35 of the switch 30 is not engaged by the edge of the transporting member 56 except after each second pocket 7 as will be understood from Fig. 6. In each instance the width of the tray is made sufficiently greater than a corresponding integral multiple of the length of the packages to permit the packages to roll away from the trough freely, but not much greater than this. For example, when one row only is to be built up at a time, the tray width need be only a little greater than one roll, and when two rows are to be built up at a time, as when using the transporting member of Fig. 6, the width of the receiving tray is made a little greater than the sum of the lengths of two rolls. In such cases also the length of the horizontal portion 20*c* of the trough, and the length of the outlet from the trough, must be great enough to hold and permit the escape of a corresponding number of rolls placed end to end of each other of course. By, say, providing the machine with movable roll-transporting members like 6 for long rolls and members like 56 for short rolls, substitutable one for the other, and making the horizontal section 20*c* long enough to accommodate the longest length to be handled, the mechanism can be adapted to collect, for example, both long rolls of small diameter coins in single rows and short rolls of large diameter coins in say, two rows, side by side.

Usually, in such cases, I provide an abutment 60, within and extending transversely of the trough near its lower end, and fixable, as by a bracket and clamping screw 61, at various places along, say, the upper edge of the trough wall 20*d*. By moving this abutment 60 to an appropriate position, a single roll, long or short, can be stopped with its middle exactly opposite the middle of the tray platform 40, and thus opposite the center line of an appropriate receiving tray, or two or more rolls arranged end to end in 20*c* can be placed with the middle of the aggregate opposite the center line of the tray platform. The abutment 60 therefore serves to center the coin packages with respect to a fixed tray position. Such an abutment is not entirely necessary however, as will be observed.

In the operation of the mechanism illustrated in Figs. 1 to 5, packages of coins, in the form of rolls, are produced by the coin package machine and set in the disc 6 as heretofore. As this transporting disc 6 brings a coin package to or near the outlet 9, bell-crank 35 enters the related radial passage 38, and accordingly switch 30 opens and the gate 22 closes, Fig. 5. While the disc 6 stands in this position for a moment, the package falls endwise through the outlet 9 and slides down the trough and comes to rest in the horizontal portion 20*c* of the trough, and against the gate 22. As necessary, the abutment 60 may be positioned to stop the lengthwise movement of the package directly opposite the tray. Sometime after this the disc 6 advances again, and as it does so the edge of the disc actuates the bell-crank 35 and thus closes switch 30 and holds it closed while the disc is advancing to bring another package to the outlet 9. During this period therefore the gate 22 is held open and the package rolls out of the trough into the tray. The cycle then repeats. As a coin package rolls into the tray, it rolls to the end of the tray or to the package which preceded it, as the case may be. A layer of coin packages is thus built up. Also as coin packages are added to the tray, their weight causes the tray carrier and tray to sink until as one layer of packages is completed, succeeding packages roll on the first layer and build up a second layer. Similarly additional layers can be formed in the tray.

The operation in the case when two or more rolls are to be delivered from the trough at a time (for example, when using a transporting member 56) is quite like that already described except that as the, as it were, first roll arrives at the gate 22, it is held there until the second roll also arrives at the gate 22. Thereafter the two rolls are allowed to escape from the trough together, and located end to end of each other. Similarly with the third and fourth rolls, the fifth and sixth rolls, etc.

It will be understood that the invention is not limited to the details of construction and operation described above and shown in the accompanying drawings except as appears hereafter in the claims.

I claim:

1. The combination with a coin handling machine having an outlet through which the machine delivers packages of coins, of an inclined conveyor, the upper portion of said conveyor being disposed adjacent said outlet to receive coin packages endwise and the lower portion of said conveyor being substantially horizontal and having an opening positioned to permit the movement of coin packages therefrom sidewise, a movable gate to prevent the escape of packages from said horizontal portion of said conveyor, and means to cause said gate to release packages from said conveyor when substantially at rest in a horizontal position.

2. The subject matter of claim 1 characterized by the fact that a carrier is provided to support and position a tray with one end of the tray adjacent said gate to receive coin packages sidewise therefrom and with the bottom of the tray inclined downwardly away from the gate.

3. The subject matter of claim 1 characterized by the fact that a package-receiving tray is provided, one end of the tray being disposed adjacent said gate to receive coin packages sidewise therefrom, the bottom of the tray being inclined downwardly from said gate, and the width of the tray being sufficiently greater than an integral multiple of the length of the packages to permit said packages to roll away from the gate and toward the opposite end of the tray.

4. The combination with a coin handling machine having an outlet through which the machine delivers packages of coins endwise one by one, an inclined trough to convey each coin package endwise from said outlet, the upper end of the trough being disposed adjacent said

outlet to receive each coin package endwise therefrom, the upper portion of the trough being disposed at a sufficient angle to the horizontal to enable the packages to slide by gravity to the lower end of the trough, and the lower portion of the trough being substantially horizontal and having an opening in one side to permit the escape of each coin package sidewise from the trough, a movable gate to prevent the escape of packages from the side opening of the trough, and means to cause said gate to release packages from the trough when substantially at rest in the horizontal portion of the trough and before the next succeeding package has entered the trough.

5. The subject matter of claim 4, characterized by the fact that a carrier is provided to support and position a package-receiving tray with one end of the tray adjacent said side opening of the trough and with its bottom inclined to enable the packages to pass by gravity toward the opposite end of the tray.

6. The subject matter of claim 5, characterized by the fact that said carrier lowers a tray on it as coin packages accumulate in the tray.

7. The subject matter of claim 5, characterized by the carrier having a spring for urging the carrier and the tray toward the trough, said spring permitting the carrier to move to lower positions as coin packages accumulate on the tray.

8. The subject matter of claim 4 characterized by the fact that an abutment, adjustable to different positions lengthwise of the trough, is provided in said horizontal portion of the trough to adapt the mechanism to packages of different lengths.

9. The subject matter of claim 4 characterized by the fact that said coin handling machine includes a movable member which moves coin packages to said outlet, said means to cause the gate to release coin packages comprises a solenoid and a switch controlling the solenoid, and said switch is engageable by said movable member for operation thereby.

10. The subject matter of claim 5 characterized by the carrier for the tray having parallel motion apparatus for maintaining the tray on the same inclination in all positions.

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