ESCAPE AND FEEDING MECHANISM FOR FASTENERS
Anthony P. Mazurkivich, Waterbury, Conn., assignor to Scovil Manufacturing Company, Waterbury, Conn., a corporation of Connecticut
Filed Sept. 16, 1965. Ser. No. 487,786
5 Claims. (Cl. 221—238)

This invention relates to a machine for feeding a plurality of fastener elements from a single source of supply to a plurality of setting stations.

One object of this invention is to provide an escapement and transfer mechanism that will pick up a plurality of fastener elements from a single chute and feed them to a transfer station from which they are transferred individually to a plurality of fastener setting stations.

Another object is to provide an escapement mechanism in which the fasteners are provided in a series of pick-up pockets that move transversely past the delivery end of a chute and which is capable of picking up the elements from said chute during its movement in either direction across the discharge end thereof.

Other objects and advantages will be evident from the following description considered together with the accompanying drawings, in which:

FIG. 1 is a plan view of a plural element feeding unit embodying the basic principles of my invention;

FIG. 2 is a longitudinal sectional view through the guide rail of the machine, taken along the line 2—2 of FIG. 1;

FIG. 3 is a plan view of the chute pick-up station of the machine on a larger scale;

FIG. 4 is a longitudinal sectional view of the transfer section of the machine, taken along the line 4—4 of FIG. 1;

FIG. 5 is a view similar to FIG. 4 on a larger scale at the point of transfer;

FIG. 6 is a transverse sectional view of that portion of the guide rail where it intercepts the feed chute, on a larger scale;

FIG. 7 is a perspective view of a portion of the transfer slider as it appears from the underside; and

FIG. 8 is a perspective view of one of the types of fastener elements that may be handled by this invention.

This invention is designed to pick up a plurality of snap fastener elements S from a single chute, and feed them individually and properly oriented to a gang of setting stations. The machine here shown is designed to feed snap fasteners of the envelope type such as shown in FIG. 8, wherein prongs P are struck out of the flange F for the purpose of securing the fastener by itself to a support member without the need of some other attaching device. However, it is to be understood that the machine, with slight alterations, can be used to feed other types of snap fasteners of conventional construction provided with an interlocking mechanism and joined into a hopper of conventional construction located thereabove and through which the elements are fed by gravity downwardly through the channel 16.

The manner by which a plural number of elements S are individually picked up from the single chute 15 is best shown in FIGS. 2, 3 and 6. The feed slide 12 is provided with a series of pick-up slots or pockets 17 that function to pick up the elements S as the slide 12 is moved past the discharge end of the chute 15. As noted from FIG. 6, the base 17a of each slot 17 is positioned on a plane common with the discharge end of the T-shaped channel 16 for the purpose of forcing the individual fastener elements from the chute 15 into their respective slots 17 by the force of the remaining elements moving down the channel 16 through said chute 15.

A desirable feature of this invention is the assurance that the fastener elements will be fed into the pick-up slots 17 in either direction of the movement of the feed slide 12 past the discharge end of the chute 15. Normally, the elements will be fed individually into the slots 17 as said slide 12 is moved to the left as viewed in FIG. 1 and if failure should occur in not depositing a fastener element into every pick-up slot 17 as the slide moves to the left, then a second opportunity is afforded to make sure that each slot is charged with a fastener element as the slide 12 is moved to the right past the discharge portion of the chute. For this purpose, it will be noted from FIG. 3, that the partitions 17c, which divide and separate the pick-up slots 17, are preferably cut back along the edges that face the chute as indicated at 17c. Also, the space defined by the side edges of slot 17 and the distance between the sidewalls of channel 11 is such that the base or flange F of the fastener elements being fed will substantially fill this area. Consequently, the rim of the element flange F will project slightly beyond the edge of 17c of partitions 17, and when said elements are deposited within their respective slots, they will act as a cutoff for the remaining elements in the channel 16 as the slide 12 moves past the discharge end of the chute 15. The remaining upper face of the slide 12 is also cut back as indicated at 21a, and this surface then acts as the cutoff for the remaining elements in the chute 15 as that portion of the slide passes the discharge end of said chute.

After the feed slide 12 is charged with the fastener elements in its movement to the left, the air cylinder 13 will be reversed, moving said slide to the right to a transfer station as defined by a pair of guide plates 19 and 21 attached to and extending in opposite directions from the guide rail 10. The guide plate 18 which more specifically may be considered a support guide plate, is provided with a series of grooves 20 in which are guided a like number of ribs 21 projecting downwardly from a pusher plate 22 slideable along the top surface of said support guide plate. The pusher plate 22 may be actuated by an air cylinder 23 having its plunger rod connected to a bracket 24 suitably attached to the upper rear end of a plate 22.

The opposite guide plate 19, which may be considered a transfer guide plate, is similar to plate 18 and likewise is formed with a series of grooves 25 that align with the grooves 20 of plate 18. Specifically, the adjacent ends of the support and transfer guide plates are fitted into suitable cut-out slots 18a and 21a provided in the opposite walls that define channel 11 of rail 10 and are made secure to said rail as by screws 23a. The base of the grooves 20 and 25 will, of course, be on a common plane with the base surfaces of the pick-up slots 17 in feed slide 12.

The grooves 25 are the means by which the elements S are transferred from the pockets 17 of the slide 12 to a plurality of setting stations as defined by setting members 26 and a like number of setting dies 27 descending from above.

The anvil members 26 are suitably mounted in a common support block 28 located below and
adjacent the free end of the transfer guide plate 19. From FIG. 1, it will be noted that the free end of the transfer plate 19 extends slightly beyond the anvil members 26, and the bases of the grooves 25 are provided with arcuate cut-outs 29 to clear the anvil members 26, and are substantially on a common plane with the upper surfaces of said anvils.

As noted from FIGS. 1 and 5, the forward end of the pusher plate 22 is specially-shaped to accommodate the particular shape of the fastener elements being fed. For the type of fastener shown in this case, the plate 22 is formed with a projecting lip 30 that is spaced a sufficient distance above the base of the groove 25 to clear the tips of the prongs P of the fastener elements S. (Note the dotted position of the pusher plate 22 in FIG. 5.) Underneath the lip 30, the forward end of each rib 21 is formed with a shoulder 31 having an arcuate cut-out 32 for receiving and pushing against the prongs P during the transfer operation. Also, a clearance recess 33 is cut into each of the ribs 21 to accommodate the flange F of the elements S. The purpose of the projecting lip 30 is to extend over the top of the major portion of the fastener elements to prevent said elements from jumping out or being dislodged from the guide grooves 25 in transfer plate 19, if perchance, the fastener end 20 should encounter any obstruction during the transfer operation.

OPERATION

In the operation of this mechanism, when the feed slide 12 is moved to the left by the action of the air cylinder 13, the pockets 17 in said slide will each be charged with an individual fastener element S as said pockets move sequentially past the discharge end of the chute 15, such as shown in FIG. 1, which is the limit of the slide pick-up stroke. Next, the air cylinder 13 will be reversed and the feed slide 12 will be moved to the right to a position where the pockets 17 will be aligned with grooves 20 and 25 in the support and transfer guide plates 18 and 19, respectively.

Next, when the setting stations are ready to receive the fastener elements, the air cylinder 23 will be actuated and cause the pusher plate 22 to move across the guide rail 10 and feed slide 12, whereupon the elements in the pockets 17 will be engaged by the ribs 21 and forced along the plate grooves 25 to a point where they are positioned in alignment with the anvil members 26 and setting dies 27. The air cylinder 23 will next be reversed, returning the pusher plate to start position after which the element-feed cycle must be repeated.

From the above, it will be observed that I have devised a very simple and economical mechanism for feeding a plurality of fastener elements from a single hopper chute in a properly oriented manner to a plurality of setting stations.

What I claim is:

1. A fastener feeding mechanism for distributing fastener elements from a single source of supply to a plurality of setting stations, said mechanism comprising a gravity-fed chute having a discharge end and said chute adapted to receive and guide a row of fastener elements from a single hopper, a guide rail positioned normal to and extending laterally across the discharge end of said chute, a feed slide member slidable in said rail and having a series of element-receiving pockets therein adapted to pick up individual elements as the slide is moved past the discharge end of said chute, the opposite side of said guide rail being intercepted by a series of grooves spaced according to the position of the pockets in said feed slide and laterally spaced from the discharge end, said series of grooves leading from said guide rail to the setting stations, and a transfer plate movable across said guide rail, said plate having depending ribs slidably in said grooves and serving to move the fastener elements out of said receiving pockets through said grooves to said setting stations.

2. A fastener feeding mechanism as defined in claim 1, wherein the transfer plate has a projecting lip extending beyond the projected end of the ribs and serving to overlap said fastener elements as they are being moved through said guide means.

3. A fastener feeding mechanism for distributing fastener elements from a single source to a plurality of setting stations, said mechanism comprising a gravity-fed chute having a discharge end, said chute adapted to receive and guide a row of fastener elements from a single hopper, a guide rail positioned normal to and extending laterally across the discharge end of said chute and having an upper opening channel therein, a feed slide slidably in said channel and having a series of pockets therein adapted to pick up elements individually as the elements are spaced past the discharge end of said chute, said guide rail having a series of cross slots or grooves intercepting said channel laterally spaced from the discharge end and spaced according to the position of said pockets in said feed slide, said cross slots or grooves being said guide means for transferring the elements singularly from said slide pockets to said setting stations.

4. A fastener feeding mechanism as set forth in claim 3, wherein the pockets in said slide are defined by cross partitions having relieved portions on their edges adjacent the chute discharge end and wherein said relieved portions and fastener elements previously fed into said pockets act as a cut-off for the elements in said chute when the slide is moved to its discharge position.

5. A fastener feeding mechanism for distributing fastener elements from a single source to a plurality of setting stations, said mechanism comprising a gravity-fed chute having a discharge end and said chute adapted to receive and guide a row of fastener elements from a single hopper, a guide rail positioned normal to and extending laterally across the discharge end of said chute, a feed slide slidable in said rail and having a series of pockets therein adapted to pick up elements individually as the slide is moved past the discharge end of said chute in either direction, said guide rail at a distance removed from said chute having a series of cross slots therein spaced according to the positions of pockets in said feed slide, and means for moving said individual elements out of said pockets to the setting stations of the machine.

References Cited by the Examiner

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Date</th>
<th>Inventor</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,486,461</td>
<td>11/1949</td>
<td>Bousquet</td>
<td>221—93 X</td>
</tr>
<tr>
<td>2,828,888</td>
<td>4/1958</td>
<td>Nicole</td>
<td>221—68 X</td>
</tr>
<tr>
<td>2,866,561</td>
<td>12/1958</td>
<td>Groves</td>
<td>221—264 X</td>
</tr>
<tr>
<td>3,193,136</td>
<td>7/1965</td>
<td>Stumpf et al.</td>
<td>221—225 X</td>
</tr>
</tbody>
</table>

SAMUEL F. COLEMAN, Primary Examiner.