

April 4, 1961

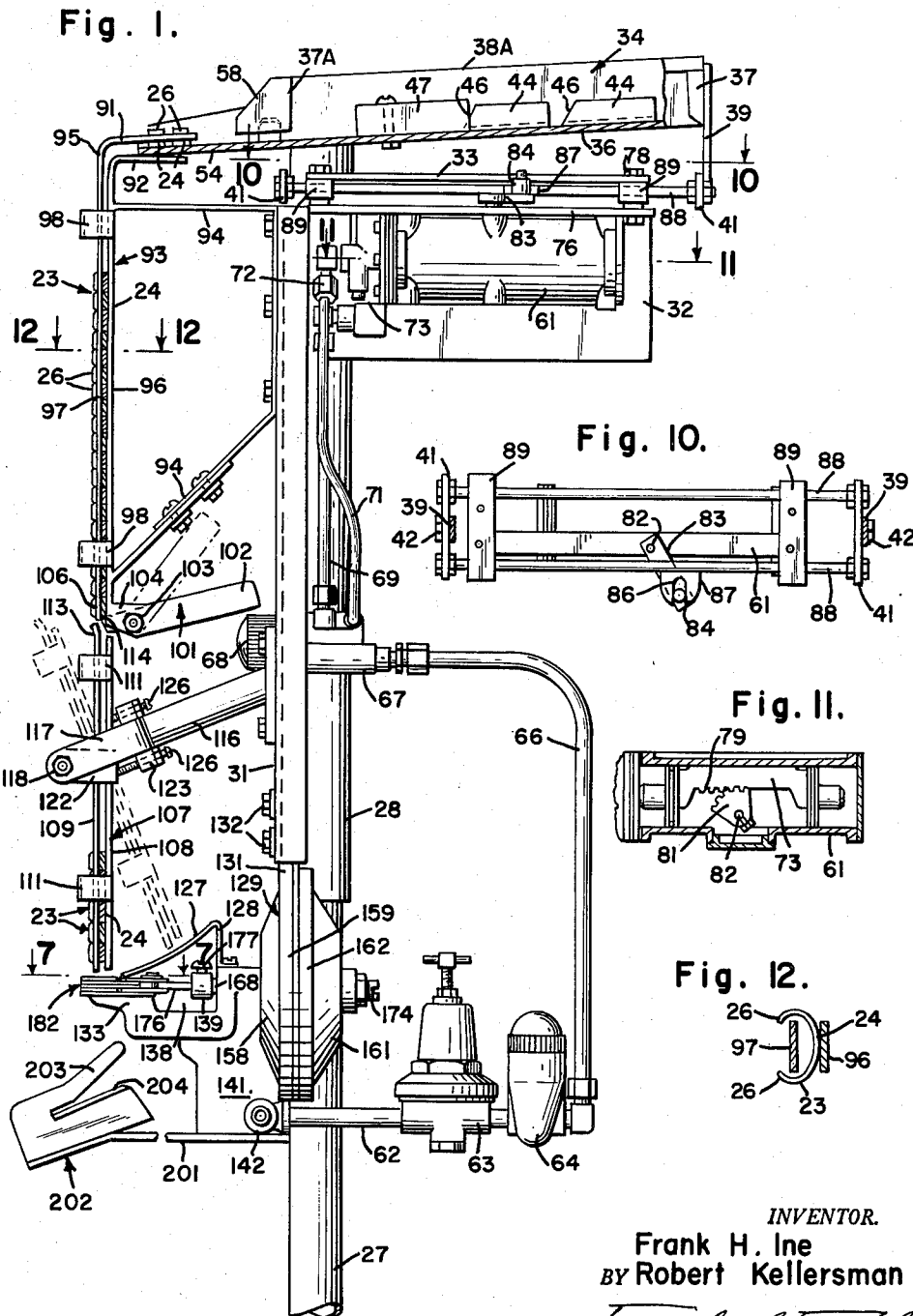
F. H. INE ET AL

2,977,600

AUTOMATIC CLIP FASTENING DEVICE

Original Filed Jan. 27, 1956

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

Fig. 2.

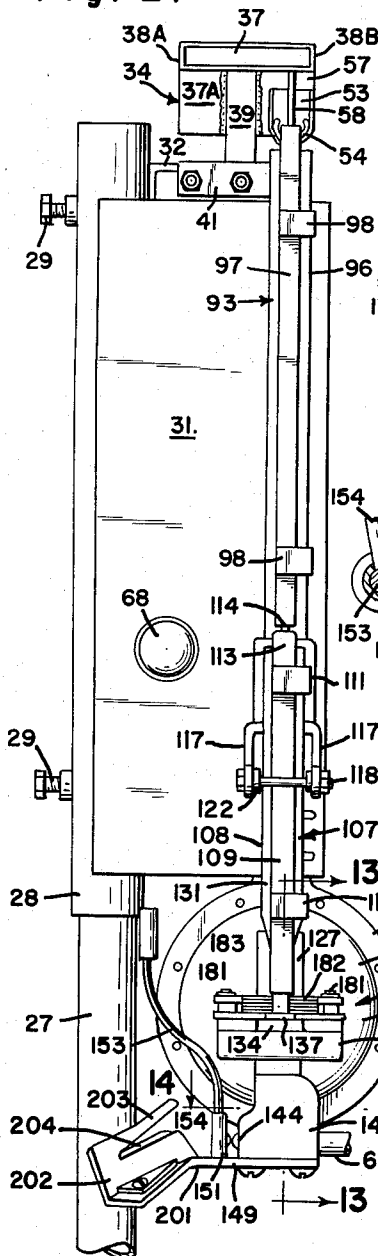


Fig. 13.

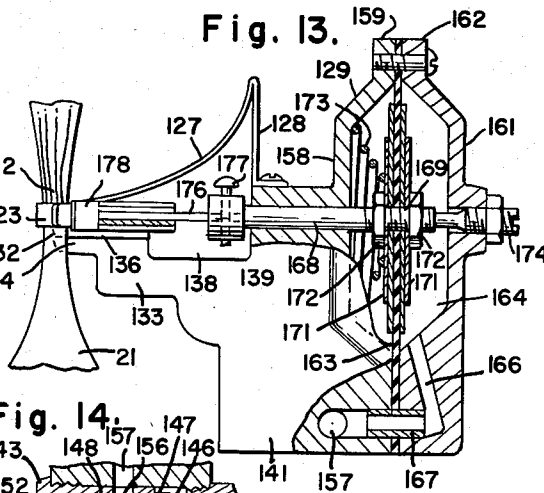


Fig. 14.

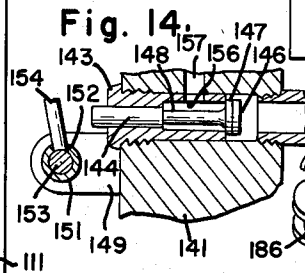


Fig. 15.

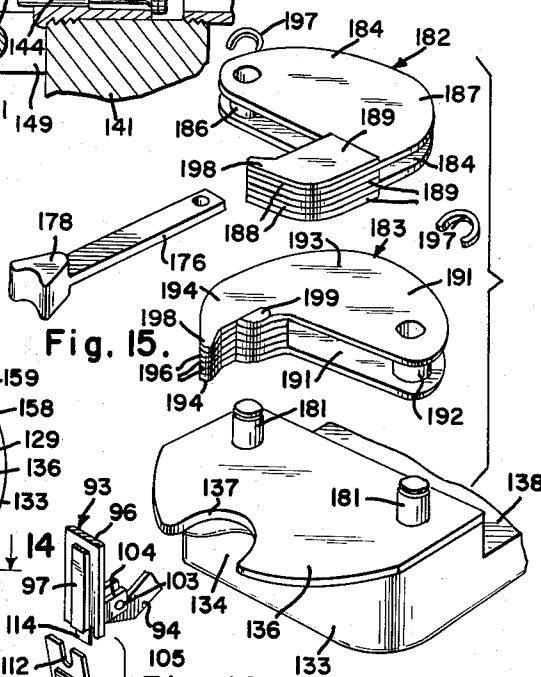
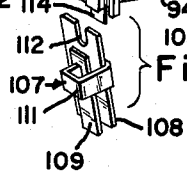


Fig. 16.



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3 Sheets-Sheet 3

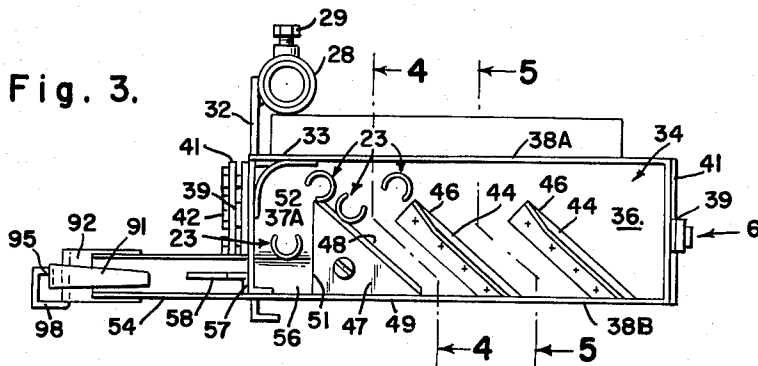


Fig. 8.

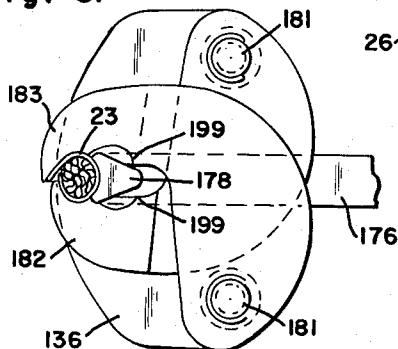


Fig. 9.

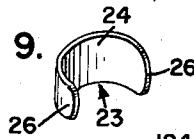


Fig. 7.

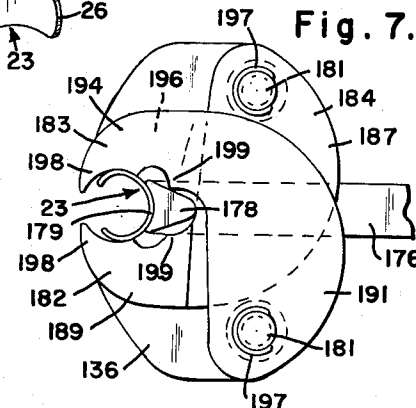


Fig. 4.

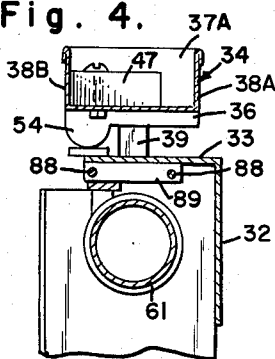


Fig. 5.

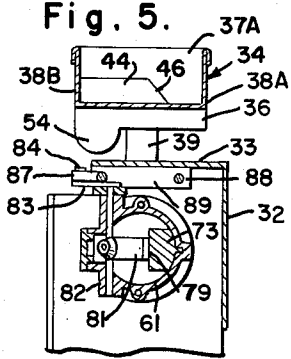
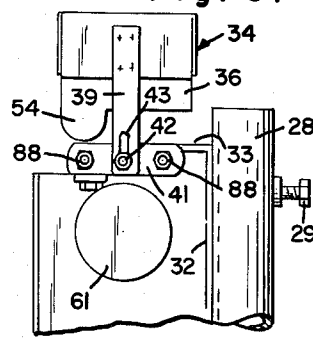


Fig. 6.



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AUTOMATIC CLIP FASTENING DEVICE

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Original application Jan. 27, 1956, Ser. No. 561,732,
now Patent No. 2,907,494, dated Oct. 6, 1959. Di-
vided and this application Sept. 29, 1959, Ser. No.
843,310

7 Claims. (Cl. 1—329)

This invention relates to a new and improved auto-
matic packaging clip fastener. It is a division of my
application, Serial No. 561,732, filed January 27, 1956,
now U.S. Patent No. 2,907,494.

More particularly, the invention relates to a machine
which fastens a metal clip around the closed neck of a
bag in order to secure the bag in closed position and seal
the contents thereof. The clips employed are formed of
heavy gauge sheet metal and substantially C-shaped in
original condition and are bent by the apparatus herein-
after described into a substantially circular shape with
one of the arms of the C overlapping the other and with
the twisted, closed neck of the bag clamped tightly inside
the clip.

One of the principal features and advantages of the
present invention is the fact that a standard clip may be
employed to fit a variety of different bags wherein the
thickness of the twisted bag portion varies depending
upon the size of the bag and the thickness of material
thereof.

Another feature of the invention is the fastening me-
chanism for closing and crimping each clip around a bag
neck, such mechanism employing a plunger which is
pneumatically actuated and moves the open clip toward
the bag. The jaws are engaged by the outer extremities
of the arms of the clip in such manner that as the plunger
advances, the arms of the clip are forced into engage-
ment against the jaws, which said force causes the latter
to pivot and close tightly around the clip. Accordingly,
mechanical actuation of the jaws by instrumentalities
other than the clip itself is eliminated. One advantage
of this construction is the fact that the jaws are not
closed when there is no clip positioned therein.

Another feature of the invention is the fact that the
contour of the jaws is such that one of the jaws is en-
gaged by the clip prior to the time that the other is, with
the result that one of the jaws closes in advance of the
other, thereby causing the arms of the clip to overlap,
as heretofore mentioned.

Another feature of the invention is the use of a spe-
cially constructed magazine which discharges clips in
properly aligned position and also guides the clips from
the hopper to the closing jaws.

Another feature of the invention is the provision of
pneumatically actuated means to actuate the hopper in
order to align the clips and also to close the jaws by
movement of the plunger.

Other objects of the present invention will become
apparent upon reading the following specification and re-
ferring to the accompanying drawings in which similar

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characters of reference represent corresponding parts in
each of the several views.

In the drawings:

Fig. 1 is a side elevation of the device with the clips
in the magazine broken away in section;

Fig. 2 is a front elevation;

Fig. 3 is a top plan;

Figs. 4 and 5 are transverse, vertical sectional views
taken substantially along the lines 4—4 and 5—5 of Fig.
3, respectively;

Fig. 6 is a fragmentary end elevation viewed as indi-
cated by the arrow 6 in Fig. 3;

Fig. 7 is a fragmentary enlarged top plan view of the
jaws at the commencement of a clip closing cycle as
viewed along the line 7—7 of Fig. 1;

Fig. 8 is a view similar to Fig. 7 at the completion of
the closing operation;

Fig. 9 is a perspective view of a clip;

Fig. 10 is a horizontal sectional view taken substan-
tially along the line 10—10 of Fig. 1;

Fig. 11 is a fragmentary horizontal sectional view taken
substantially along the line 11—11 of Fig. 1;

Fig. 12 is a transverse vertical sectional view through
the mechanism taken substantially along the line 12—12
of Fig. 1;

Fig. 13 is an enlarged fragmentary vertical sectional
view taken substantially along the line 13—13 of Fig. 2;

Fig. 14 is a fragmentary horizontal sectional view taken
substantially along the line 14—14 of Fig. 2;

Fig. 15 is an exploded perspective view of the jaws and
associated parts; and

Fig. 16 is an enlarged, fragmentary perspective view
of the upper magazine latch.

The present invention is employed in closing bags
such as plastic bags used to package meat products and
the like. Preferably, by means forming no part of this
invention, the bags are air-evacuated and the necks are
manually twisted. The apparatus hereinafter de-
scribed clamps a sheet metal clip around twisted neck
in order to hold the same in tightly crimped condi-
tion and prevent air from entering the evacuated bag.
The clip thus employed is shown in Fig. 9 in its initial
position. Viewed in top plan the clip is essentially
C-shaped with a rounded base. The outer extremities
of the arms are also rounded to prevent injury to the bag when the clip is applied.

The apparatus which is the subject of this invention is
preferably mounted on a vertical stanchion so that
the height of the equipment may be adjusted depending
upon the height of the bag being closed. Accordingly,
there is provided a sleeve which slides on stanchion
carrying a pair of set screws which may be tightened
to lock the apparatus at proper elevation. Welded or
otherwise suitably fastened to sleeve is vertical plate
which extends substantially the entire height of the
machine and supports the other parts thereof. Adjacent
the top of the machine and likewise secured to sleeve
is an angular hopper mounting plate, the top flange
of which is horizontally disposed slightly above the level
of the top edge of vertical plate.

Positioned above top flange is hopper which is
substantially rectangular, having a bottom and perpen-
dicular ends and sides. Hopper is positioned
with bottom downwardly forwardly inclined by means
of depending legs which are fastened to horizontal

transverse links 41 by means of bolts 42. Slots 43 are formed in legs 39 so that the elevation and inclination of the hopper may be adjusted. By means hereinafter described in greater detail links 41 are horizontally vertically reciprocated in unison, thereby imparting to the hopper a rapid horizontal reciprocating or oscillating motion so that when clips 23 are deposited in the hopper in random position the rocking or vibrating motion of the hopper biases them forwardly. In order to direct clips 23 toward the outside side 38A of the hopper 34 there are positioned on the hopper bottom 36 a pair of baffles 44 disposed approximately at a 45° angle to the near side 38B of the hopper, baffles 44 being constructed of sheet metal angles and having their outer corners 46 beveled. In addition, adjacent the forward end of the hopper there is positioned a triangular block 47 having its hypotenuse 48 parallel to the upstanding flanges 44 of the baffles. One of the legs 49 of block 47 is disposed near side 38B of hopper 34 and the other leg 51 is located parallel to the front end thereof and spaced from the front end a distance slightly wider than clips 23. A fillet 52 is disposed in the forward far corner of the hopper to prevent clips from stacking or accumulating therein. The near side of the front 37A of hopper 34 is formed with an aperture 53 extending upwardly from the bottom a distance slightly greater than the height of arms 26 of the clips and this aperture merges into a trough 54 which projects forwardly from the hopper. Bottom 36 between aperture 53 and block 47 is indented with a depression 56 having a curvature merging with the bottom of trough 54. Supported above the bottom of trough 54 by means of a bracket 57 secured to front end 37A is a clip-aligning guide 58. The bottom edge of guide 58 is spaced above the bottom of trough 54 a distance slightly greater than the thickness of base 24 of clip 23. Accordingly, guide 58 prevents clips from entering trough 54 in any position other than with arms 26 extending upwardly and parallel to the side walls of the trough.

Reciprocation of the hopper is accomplished by means of a compressed air motor 61 or similar electric or vacuum operated device. As illustrated herein, a compressed air motor 61 of the type used to actuate windshield wipers for trucks is employed. Such a motor is illustrated and described in Patent No. 2,727,494, issued December 20, 1955. Compressed air is introduced through pipe 62, pressure regulating valve 63, oiler 64 and pipe 66 to valve 67 secured to the rear of vertical plate 31. Control knob 68 for valve 67 projects through the front of plate 31. By adjustment of knob 68 the flow of compressed air through valve 67 may be adjusted or closed. A pair of pipes 69—71 lead from valve 67 to a fitting 72 on the front end of motor 61 and by valve constructions and ducts in the interior of motor 61 which form no part of this invention and are not illustrated or described herein, the internal piston 73 in motor 61 is caused to rapidly reciprocate or oscillate horizontally. Motor 61 is mounted on a horizontal support 76 which, in turn, is supported from top flange 33 by means of screws 78. As shown particularly in Fig. 11, a portion of piston 73 is formed in a rack 79 engaged by a segmental gear 81 pivotally mounted in motor 61 by stub gear shaft 82, the upper end of which projects out through the top of motor 61 and carries horizontal link 83. Hence, as piston 73 reciprocates, link 83 oscillates. The upper surface of the outer end of link 83 carries roller 84. Roller 84 fits within slot 86 in lug 87 and the latter projects horizontally outwardly from one of the horizontal reciprocating rods 88. Rods 88 project through holes in horizontal guides 89 which are fastened to the underside of top flange 33. The outer ends of rods 88 carry links 41 to which legs 39 of hopper 34 are secured.

The forward edge of trough 54 fits between the hori-

zontally rearwardly extending extremities 91—92 of the upper magazine 93, the bottom of trough 54 being spaced from the base supporting or rearwardly disposed magazine member 92 and being spaced substantially below the outer or arm-separating member 91 of the upper magazine. The length of the horizontal extremities 91—92 are at least equal to the length of stroke of hopper 34. Brackets 94 attached to vertical plate 31 adjustably secure the rear or base supporting portion 96 of the upper hopper magazine 93 in place with rearwardly extending upper extremity 91 properly aligned immediately above the forward or discharge end of trough 54 and the main or vertical stretch of the magazine in proper vertical position, there being a rounded corner 95 at the bend of upper magazine 93. A pair of supports 98 are fastened to base supporting portion 96 and locate the forward or arm separating portion 97 spaced from base portion 96 a distance slightly greater than the thickness of base 24 of a clip. Accordingly, clips 23 discharged from trough 54 (and which have already been aligned with arms 26 extending vertically upwardly and parallel to the sides of the trough) feed into the gap between extremities 91—92 with arm separating extremity 91 holding the clips in proper vertical position and base supporting extremity 92 preventing the base of the clip from slipping out of the magazine. The lower end of the upper magazine carries a latch 101 which comprises a lever 102 pivotally mounted by means of bolt 103 which fastens through clevis 104 on the back of the lower end of base supporting member 96. A slot 105 is formed in the lower end of member 96 into which the point 106 of lever 102 extends. Point 106 blocks the space between members 96 and 97 and hence prevents discharge of clips from the bottom end of the upper magazine. The portion of lever 102 rearward of bolt 103 comprising a handle of considerable mass and which thus biases point 106 into position to block discharge of clips. However, when lever 102 is lifted manually, point 106 is retracted and permits clips to discharge.

Immediately below upper magazine 93 and constituting an extension thereof is lower magazine 107 which comprises a rearward or base supporting member 108 and a parallel spaced arm separating member 109 secured thereto by means of a pair of supports 111. The upper end of base supporting member 108 is formed with a groove 112 to provide clearance for retraction of point 106 of latch 101. The upper end 113 of arm separating member 109 is beveled and rests upon a depending locking finger 114 on the lower end of upper magazine member 92. Lower magazine 107 is supported from vertical plate 31 by means of bracket 116, the front lowermost end 117 of which is bifurcated with pivot bolt 118 passing through the bifurcated ends thereof. Bolt 118 passes through apertures in the outer ends of the legs 117 of a U-shaped member 122 fastened to rear or base supporting member 108 of lower magazine 107. Lugs 123 on arm 116 carry adjustable screws 126, the outer ends of which engage base supporting member 108 and hence adjustably limit the swinging movement thereof as the lower magazine is swung about pivot bolt 118 as a center. Below lower magazine 107 is an arcuately shaped sheet metal retainer 127 which is formed with a leg 128 fastened to valve housing 129 which in turn is supported from vertical plate 31. The center of curvature of arcuate retainer 127 is the center of pivot bolt 118 and hence as the lower magazine is swung from the full line position shown in Fig. 1 to the dotted line or retracted position, retainer 127 prevents clips from being dislodged therefrom.

Forward valve housing 129 is irregularly shaped and is adjustably connected to the lower end of vertical plate 31 by means of leg 131 and bolts 132. The front portion thereof is formed with a horizontal table 133

having an arcuate recess 134 in the front edge and sur-

mounted by a jaw wear plate 136 likewise formed with an arcuate recess 137 in the front. The purpose of the arcuate recesses 134 and 137 is to receive neck 22 of bag 21. The size of arcuate recess 134 in wear plate 136 is such that clip 23 deposited thereon as it drops off the lower end of lower magazine 107 does not pass through, but is held on the upper surface partially surrounding neck 22 (see Figs. 8 and 13). Rearwardly of table 133 housing 129 is formed with a downwardly recessed portion 138 which provides clearance for horizontal reciprocation of collar 139 as hereinafter appears. Below and rearwardly of recessed portion 138 is a valve body 141. Valve body 141 has a threaded connection on one side which receives a compressed air intake line 142 which branches into pipe 62. Threaded through the opposite side of valve body 141 is a valve guide 143 and horizontally reciprocably in the restricted bore of valve guide 143 is valve stem 144 which projects through guide 143 to the exterior. The inner end of stem 144 carries a valve head 146 provided with a washer 147 which seats against the end of valve guide 143 to close the valve. Intermediate valve head 146 and its outer end valve stem 144 is formed with a restricted diameter portion 148. On the bottom of valve housing 129 is a horizontal plate 149 and projecting upwardly from said plate is a sleeve 151 having a cutout 152 on the rear thereof. Sleeve 151 receives the lower end of an elongated S-shaped valve handle 153, the lower end of which is further provided with a contacting lug 154. Lug 154 is positioned to contact the outer end of valve stem 144 when the upper end of handle 153 is swung to the right as viewed in Fig. 2. Normally, force of the compressed air holds head 146 against guide 143 to close the valve. When the handle 153 is turned to the right, however, as viewed in Fig. 14, washer 147 unseats, permitting communication between compressed air intake line 142 and a port 156 formed in the valve guide 143 which is aligned with a duct 157 in valve body 141.

The rearward end of housing 129 comprises the front chamber forming portion 158 which is surrounded by a substantially annular flange 159. On the back of portion 158 is a rear chamber forming portion 161 with a peripheral substantially annular flange 162. Gripped between flanges 159 and 162 is a resilient diaphragm 163 in chamber 164 between portions 158 and 161. Duct 156 communicates with a rearwardly extending duct 166 which in turn opens into rear portion 161 behind diaphragm 163. A resilient sleeve 167 is positioned in ducts 157 and 166 to prevent spreading of diaphragm 163 from closing off communication therebetween.

Housing 129 is formed with a horizontal bore substantially concentric with diaphragm 163. Slidable in this bore is a rod 168, the inner end 169 of which is threaded and passes through a central aperture in diaphragm 163. On either side of the diaphragm 163 concentric with the central aperture are metallic stiffener members 171 and nuts 172 threaded on rod end 169 on opposite sides of stiffener members 171 securing rod 168 to diaphragm 163 for movement therewith. Forwardly of diaphragm 163 within chamber 164 is a spiral spring 173, one end of which bears against the wall of chamber forming portion 158 and the opposite end of which bears against stiffener member 171, thereby biasing diaphragm 163 to the right as viewed in Fig. 13. Threaded into the wall of rear chamber forming member 161 is adjustment screw 174, the inner end of which bears against the end of rod 168 and limits its inward movement. Accordingly, when handle 153 is turned, the pressure of air behind diaphragm 163 moves rod 168 frontwardly or to the left as viewed in Fig. 13.

The forward end of rod 168 carries collar 139 and collar 139 likewise receives the rearward end of rectangular plunger rod 176. Screw 177 passing through collar 139 and an aperture in the end of rod 176 secures rod 176 for movement with rod 168. The forward end

of plunger rod 176 carries a triangular shaped plunger 178, the forward surface of which is formed with an arcuate recess 179 conforming to the curvature of the back of base 24 of clip 23. Hence when handle 153 is opened, plunger 178 moves the clip 23 disposed on wear plate 136 forwardly.

Projecting upwardly from wear plate 136 on opposite sides and spaced rearwardly of recess 137 are a pair of studs 181 which form pivots for the jaws 182-183. Right-hand jaw 182 is pivoted to left-hand stud 181 and vice versa. Right-hand jaw 182 is laminated. It is provided with a pair of vertically spaced apart laminae 184 which are apertured in their rearward end and carry a spacing sleeve 186 aligned with the aperture and surrounding left stud 181. In plan the laminae 184 have a semicircular portion 187 and on the forward end of the side opposite stud 181 are formed with gripping portions 188. Similarly, laminae 189 which are identical in shape with gripping portion 188 are fastened between laminae 184 and on the outside thereof so that a composite of six laminae provides right-hand jaw 182. Left jaw 183 is likewise provided with two irregularly shaped laminae 191 which are parallel and spaced apart a greater distance than laminae 184 of the right jaw, the space between providing clearance for movement of the jaws. Laminae 191 are likewise apertured and provided with an aligned sleeve 192 which surrounds right stud 181. In plan left jaw laminae 191 are likewise formed in a semicircular portion 193 and a forwardly extending gripper portion 194. Between gripper portions 194 are additional laminae 196 of similar size and shape identical with the gripper portions of laminae 191. The upper ends of studs 181 are grooved to receive retainer washers 197 which lock the jaws on studs 181.

The outer ends of the jaws are curved inwardly. The inner edges conform to the curvature of arms 23 of a clip except that the forward points 198 of the gripper portions project inwardly inside the ends of arms 23 of the clip. Accordingly, when plunger 178 moves forward and pushes clip 23 forwardly, the ends of arms 24 engage points 198. By reason of the fact that the jaws are pivoted at studs 181, the forward movement of clip 23 produces an inward pivotal movement of the jaws which compresses the same. Thus, it should be emphasized that there is no direct movement of jaws 182-183 except insofar as they are moved by the presence of a clip 23 therebetween and that the sole movement of the jaws is accomplished by movement of plunger 178. Inwardly extending point 198 of the right jaw is disposed rearwardly of the corresponding point of the left jaw (see Fig. 7). Hence, the right jaw is contacted and moved first, which causes it to lead the left jaw in closing movement. Accordingly, right arm 24 of clip 23 is closed slightly ahead of the left arm which results in the overlapping of the two arms best shown in Fig. 8. Jaws 182-183 are further formed with inwardly extending retraction points 199 so located that after jaws 182-183 are closed, when plunger 178 is retracted the triangular head thereof engages retraction points 199 and opens the jaws.

Below and to one side of the plate is an angularly disposed extension 201 which carries a cutoff 202 having a notch 203 in which is positioned a cutting edge 204. After bag 21 has been sealed, the unused portion on neck 22 is put in notch 203 and the excess material cut off.

Operation

The attendant from time to time places a quantity of clips 23 in hopper 34 in random positions. Knob 68 is turned, opening valve 67 and causing motor 61 to rapidly oscillate and thereby cause hopper 34 also to oscillate or vibrate. Baffles 44 and block 47 direct the clips forwardly and to outer side 38A of the hopper. On reaching front end 37A of the hopper, the clips turn and move

along the face of the front end until they reach depression 56 which causes them to fall with their arms 26 uppermost. Guide 58 extending in trough 54 ensures proper positioning of the clips with arms 26 up and parallel. Clips 23 pass down trough 53 in such position and slip between top and bottom extensions 91—92 of forward and rearward members 97—96 of upper magazine 93. Clips 23 pass around corner 95 and fall down to the bottom of upper magazine 93 where they are retained by latch 101. From time to time the attendant releases latch 101 by raising handle 102, making sure that lower magazine 107 is in vertical position at the time of release. A quantity of clips passes from the upper to the lower magazine until the latter is filled, whereupon latch handle 102 is released and no more clips are discharged from the upper magazine.

Through manipulation of knob 68 hopper 34 may be vibrated intermittently and as required to fill the upper magazine.

Assuming that a supply of clips 23 is installed in lower magazine 107, the operator then evacuates a bag 21 by means not shown and twist neck 22 thereof, placing the twisted portion of the neck in recesses 134 and 137 of table 133 and wear plate 136. Meanwhile, the lowermost clip in the lower magazine will drop down between jaws 182—183 being supported by wear plate 136. Thereupon the attendant moves handle 153 which unseats valve head 146 so that compressed air deforms diaphragm 163 to the left, as viewed in Fig. 13, causing plunger 178 to move forward. Plunger 178 engages the back of base 24 of clip 23 forcing the arms 26 of the clip forward against points 198 of jaws 182—183. Right jaw 182 is contacted first and this results in inward pivotal movement of right jaw 182 ahead of left jaw 183. Accordingly, the right arm is bent inside the other and the force of the compressed air is sufficient to tighten clip 23 securely around neck 22 of bag 21 and seal the same. On release of valve handle 153 on completion of the closing operation, spring 173 retracts plunger 178 which, in turn, engages retraction points 199 of jaws 182—183 and causes the jaws to open. The operator then removes the bag, cuts off the unused portion of the bag by inserting the same in notch 203.

It will be noted that when the operator pushes the neck of the bag into recess 134 in rear plate 136 he engages with his hand the lower end of lower magazine 107 causing it to pivot rearwardly about pivot bolt 118 to its dot-and-dash line retracted position shown in Fig. 1. Retainer 127 which the lower end of magazine 107 slidably contacts throughout its swingable movement from clip feeding position to retracted position and vice versa, prevents clips from falling off the end of the magazine. When the sealed bag is removed, gravity causes the lower magazine to return to the vertical or full line position of Fig. 1, whereupon the next clip in order falls between jaws 182—183 onto wear plate 136, thereby completing the operational cycle.

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In a bag clipping machine for closing substantially C-shaped clips, a jaw-mounting table, a first and a second pivot on said table, a first jaw pivotally mounted on said first pivot, a second jaw pivotally mounted on said second pivot, each said jaw being formed with an inwardly directed point at its outer end and an irregularly curved portion behind said point shaped to receive a portion of a clip, said points being opposed to each other and located on opposite sides with respect to their respective pivots, said jaws being crossed, a plunger behind said jaws, said plunger being positioned to engage behind

a clip placed between said jaws, and means for reciprocating said plunger to force said clip toward said points, whereby the ends of said clip engage said points and pivot said jaws to close said clip.

2. A machine according to claim 1 in which said plunger is formed with a rearwardly converging portion and each said jaw is formed with a retraction point positioned rearwardly of said curved portion, said converging portion of said plunger engaging said retraction points on the return stroke of said plunger to open said jaws.

3. In a bag clipping machine for closing substantially C-shaped clips, a jaw-mounting table, a first and a second pivot on said table, a first jaw pivotally mounted on said first pivot, a second jaw pivotally mounted on said second pivot, each said jaw being formed with an inwardly directed point at its outer end and an irregularly curved portion behind said point shaped to receive a portion of a clip, said points being opposed to each other and located on opposite sides with respect to their respective pivots, said jaws being crossed, said jaws being formed with an opening approximately at the point of crossing of said jaws, a rod reciprocable within said opening, means guiding reciprocable movement of said rod in a direction parallel to the plane of movement of said jaws, means located behind said jaws for reciprocating said rod, and a plunger on the forward end of said rod to engage the base of one of said clips when said clip is positioned within said jaws and to force said clip toward said points, whereby the ends of said clip engage said points and pivot said jaws to close said clip.

4. A bag closing machine for closing substantially C-shaped clips having a curved base and a pair of arms, a support for a said clip, a frame, a first and a second pivot on said frame, a first and a second jaw above said support, said jaws being pivotally mounted on their respective pivots and crossed, each said jaw being formed with an inwardly directed point at its forward end, said points being opposed to each other and located on opposite sides with respect to their respective pivots, said points being spaced apart a distance less than the gap between said arms of said clip, a plunger movable parallel to said support through the crossed position of said jaws, said plunger being positioned to engage behind said clip, and means for moving said plunger toward said points, said arms of said clip being positioned to engage said points as said plunger is moved toward said points to pivot said jaws to close said clip.

5. The combination of claim 4 in which said jaws are shaped so that said first jaw is engaged by one of said arms before said second jaw is engaged, whereby said first jaw leads said second jaw in closing movement.

6. A bag closing machine for closing substantially C-shaped clips having a curved base and a pair of arms, a support for a said clip, a frame, a first and a second pivot on said frame, a first and a second jaw above said support, said jaws being pivotally mounted on their respective pivots and crossed, each said jaw being formed with an inwardly directed point at its forward end, said points being opposed to each other and located on opposite sides with respect to their respective pivots, said points being spaced apart a distance less than the gap between said arms of said clip, a plunger movable parallel to said support through the crossed position of said jaws, said plunger being positioned to engage behind said clip, and a pneumatic motor on said frame, said motor being arranged to move said plunger toward said points, said arms of said clip being positioned to engage said points as said plunger is moved toward said points to pivot said jaws to close said clip.

7. A bag closing machine for closing substantially C-shaped clips having a curved base and a pair of arms, a support for a said clip, a frame, a first and a second pivot on said frame, a first and a second jaw above said support, said jaws being pivotally mounted on their respective pivots and crossed, each said jaw being formed with

an inwardly directed point at its forward end, said points being opposed to each other and located on opposite sides with respect to their respective pivots, said points being spaced apart a distance less than the gap between said arms of said clip, a plunger movable parallel to said support through the crossed position of said jaws, said plunger being positioned to engage behind said clips, and means for moving said plunger toward said points, said arms of said clip being positioned to engage said points as said plunger is moved toward said points to pivot said

jaws to close said clip, said jaws being formed with retraction points, said plunger being formed with the rearwardly converging surfaces located to engage said retraction points on the return stroke of said plunger to spread said jaws.

References Cited in the file of this patent

UNITED STATES PATENTS

2,205,690	Green	June 25, 1940
2,866,975	Ine	Jan. 6, 1959