June 23, 1964 F. H. INE ETAL 3,138,288

MECHANISM FOR FEEDING U-SHAPED CLIPS

Filed May 9, 1961 2 Sheets-Sheet 1

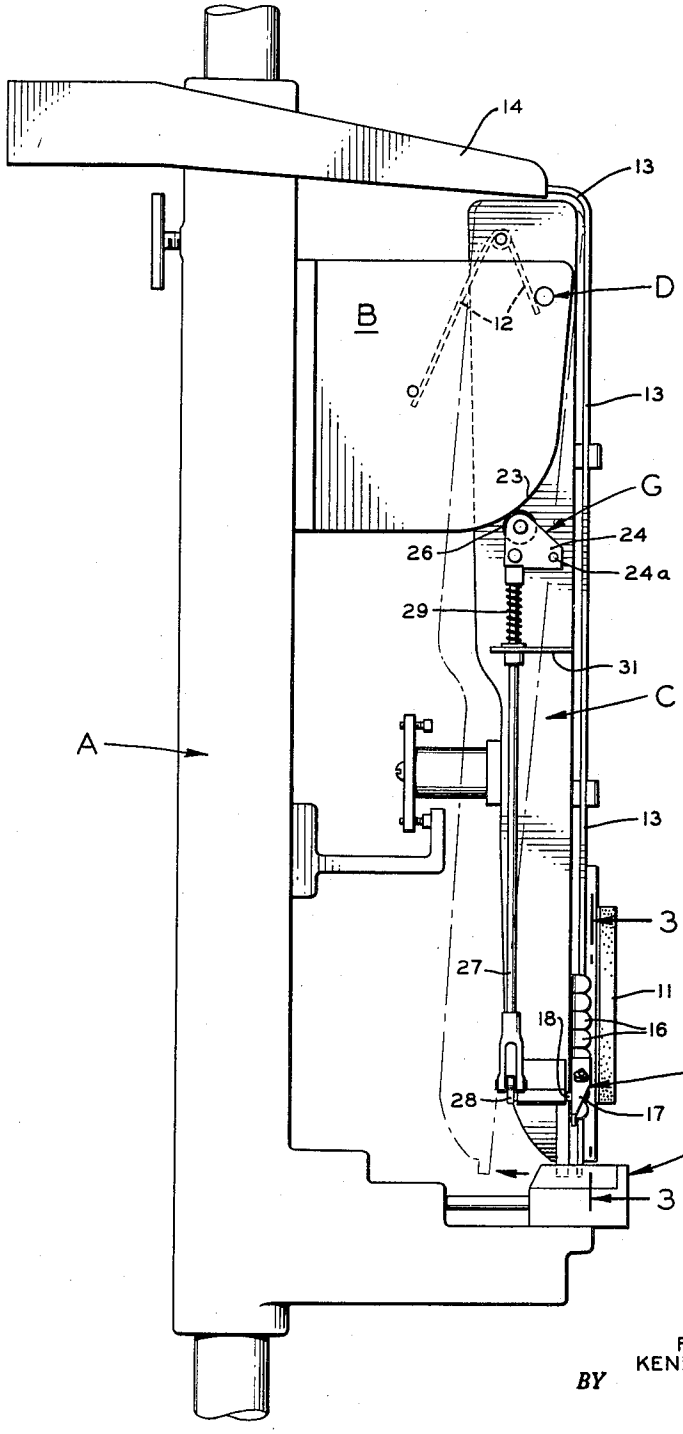



FIG. 1.

*INVENTORS*
FRANK H. INE
KENNETH E. BELKNAP

*BY*

June 23, 1964 F. H. INE ETAL 3,138,288

MECHANISM FOR FEEDING U-SHAPED CLIPS

Filed May 9, 1961 2 Sheets-Sheet 2

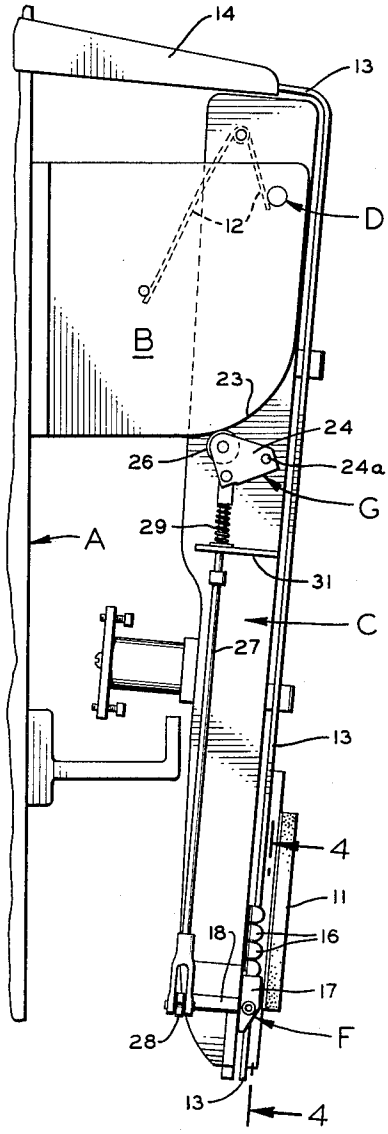



FIG_2

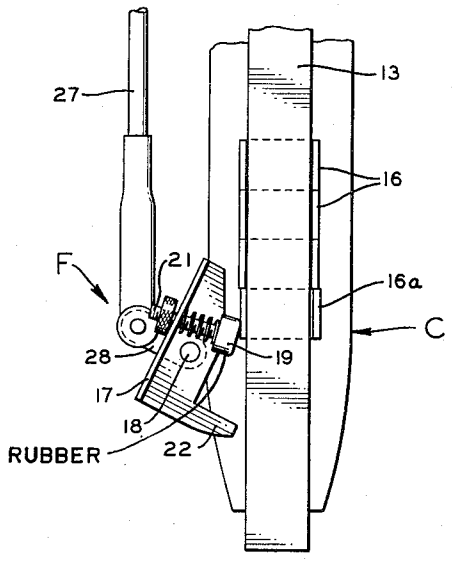



FIG_3

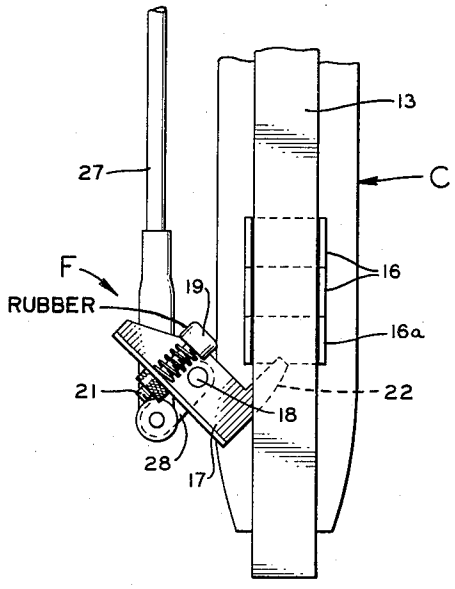



FIG_4

*INVENTORS*

FRANK H. INE
KENNETH E BELKNAP

*BY*

United States Patent Office 3,138,288 Patented June 23, 1964



3,138,288

# MECHANISM FOR FEEDING U-SHAPED CLIPS

Frank H. Ine, Milwaukee, Wis., and Kenneth E. Belknap, Dinuba, Calif., assignors, by direct and mesne assignments, to John Mohr & Sons

Filed May 9, 1961, Ser. No. 108,909
7 Claims. (Cl. 221—188)

This invention relates generally to devices used for clamping U-shaped clips around the necks of bags used in the packaging of articles, such as, for example, plastic bags used in vacuum packaging of fresh poultry and the like. More particularly, the invention relates to an improved means for feeding U-shaped clips one at a time into the jaws of a clamping mechanism prior to each cycle of clamping operation of the latter mechanism.

By way of background, it is conventional practice to vacuum package fresh chickens and turkeys in heat shrinkable packing bags. Generally speaking, each bird is positioned in a plastic bag and air is thereafter exhausted from the bag through the open neck thereof. To seal the bag against re-entry of air, the neck of the bag is axially twisted about itself and a U-shaped clip is clamped around the neck to provide a substantially airtight seal. Various types of bag clipping or clamping mechanisms have been employed in the industry to apply the clips to the bag necks. One such type of bag clipper includes a power-actuated clamp having clamping jaws which when in open position receives a U-shaped clip with the twisted neck of the bag inserted within the confines of the clip. When the jaws of the clamping mechanism are closed shut, the arms of the clip are compressed and closed in tight encircling engagement around the neck of the bag to seal the same. The U-shaped clips are guided and fed one at a time into the open jaws of the clamping mechanism prior to the commencement of each clamping cycle by means of a magazine clip feed located vertically above the clamping mechanism. More specifically, and as will be described more fully herein, the U-shaped clips are dispensed from a suitable hopper onto a vertical guide bar whereby the clips slidably embrace the guide bar and move by gravity down the guide bar where they are released one at a time into the open jaws of the clamping mechanism as needed.

Various means have been suggested and employed for controlling the release of the clips successively and only one at a time into the clamping mechanism. It has been our observation and experience that the prior art means for accomplishing this purpose are subject to certain operational disadvantages or drawbacks. Some of the conventional mechanisms with which we are familiar permit occasional jamming of the clamping mechanism by virtue of the fact that more than one clip is permitted to slip into the clamping jaw recess. Other mechanisms do not operate with sufficient consistency in performance to render them an optimum piece of operating equipment in high production processing lines.

A principal object of the present invention is to provide a clip release mechanism which for all practical purposes will positively release a clip and only one clip at a time into the jaws of the clamping mechanism and at precisely the right time in the operating cycle.

The embodiment of the invention which is illustrated in the drawings and which will be described hereinafter in more detail comprises generally, and in combination, a vertically disposed guide on which is adapted to be carried a plurality of U-shaped clips slidably embracing the guide, and with a clamping mechanism located adjacent the bottom discharge end of the guide for successively receiving and clamping one at a time said U-shaped clips. We provide clip release means mounted toward the bottom end of the guide, although the said release means



is located a substantial distance spaced upwardly from the extreme bottom end of the guide. This insures that the release mechanism is located out of the way of the clamping mechanism whereby only one clip can drop into the open jaws of the clamp at a time and whereby no part of the release mechanism interferes with an operator's manual handling of the bag either before or during the clamping operation thereof.

A more specific object of the invention is to provide a rocker arm type of clip release mechanism mounted on the vertical guide arm and in association with other means for actuating the release mechanism each time the guide arm is moved into clip feeding position relative to the clamping mechanism prior to commencement of a bag clamping cycle.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a side elevational view of the invention showing the parts in one position of operation;

FIG. 2 is a view similar to FIG. 1 (with certain portions shown fragmentarily) and illustrating the parts in a second position of operation;

FIG. 3 is an enlarged fragmentary front elevational view of the clip release mechanism, and with the parts shown in an operating position corresponding to FIG. 1; and

FIG. 4 is the same as FIG. 3 showing the parts in an operating position corresponding to FIG. 2.

Referring more particularly to the drawings, certain portions of the unit therein illustrated which do not comprise any part of the present invention, and which are considered conventional or within the normal understanding and comprehension of those skilled in the art, are shown more or less schematically. Those portions of the unit which either comprise or more directly relate to the present invention are shown in somewhat more specific mechanical detail.

The illustrated unit is shown as comprising a primary frame or support including a vertical section A and a horizontal frame portion or beam B. The vertical clip magazine feeder C is pivotally supported at D at its upper end to the fixed horizontal primary frame support B whereby the lower end of the magazine C is swingable into and out of substantial vertical registry relative to the jaws of a conventional clip clamping mechanism E.

The clip release mechanism constructed according to one form of the present invention is indicated generally at F, and as will more fully appear, mechanism F is actuated by a cam mechanism indicated generally at G.

In overall operation, when an operator desires to fasten a clip around the twisted neck of a bag (not shown) containing a packaged article, the operator will insert the bag neck between the open jaws of the clamping mechanism E wherein one U-shaped clip has already been fed by means to be described. As the operator moves the bag into position within the jaws, it is intended that his hand will strike against the lower cushioned part 11 of the magazine C causing the latter to swing about its pivotal axis D out of the way of the clamping mechanism and to its position shown in dotted lines of FIG. 1. After the clamping mechanism has been actuated and closed (by separate pneumatic or other power means not shown) and the bag clipping operation is completed, the operator will remove the bag neck from the jaws of the clamping mechanism E and such movement will permit the magazine C to swing back to its vertically aligned position relative to the clamping mechanism as shown in solid lines of FIG. 1. By virtue of the cam mechanism G which is

operably connected to the clip release mechanism F by a linking means to be more specifically described, each time the magazine C is swung back under action of leaf spring 12 from its position shown in dotted lines into its vertically aligned position shown in solid lines, the release mechanism F will be caused to actuate to permit one clip from the magazine to drop into proper position within the open jaws of the clamps mechanism E whereby the parts are in readiness for commencement of a new bag clipping cycle of operation.

Having described the overall operation of the device, certain more specific aspects of the structure will now be described.

As shown in FIGS. 3 and 4, the magazine C includes a vertical clip guide bar 13 to which is fed from a suitable hopper 14 U-shaped clips 16.

The sides or legs of the U-shaped clips 16 slidably embrace the guide bar 13, and by force of gravity, the clips tend to drop to the bottom discharge end of the guide bar. The clip release mechanism heretofore indicated generally at F comprises more specifically a rocker arm 17 pivotally mounted as at 18 on the side of the magazine C.

The upper end of the rocker arm is provided with a resiliently yieldably snubber 19 which may comprise more specifically a spring biased rubber bearing pad mounted on a stub shaft 21. The lower end of the rocker arm is provided with a projecting latch or pawl 22 extending generally parallel to the snubber and projecting toward the side of the guide bar 13 on which the clips 16 are slidably supported.

In operation, when the rocker arm occupies its position as shown in FIGS. 1 and 3, the snubber 19 will frictionally bear against an adjacent side of the lowermost clip 16*a* on the guide bar 13. While maintained in this position, the snubber will prevent further downward slidable movement of said lowermost clip. When the rocker arm is rocked to its position shown in FIGS. 2 and 4, it will be seen that the snubber is moved out of contact with the lowermost clip 16*a* which permits the latter to slide freely down the guide to a point where it is stopped by means of the projecting pawl or latch 22. Subsequently, when the rocker arm is swung back to its first position as shown in FIGS. 1 and 3, the latch swings out of the path of the lowermost clip 16*a* and the latter is then free to slidably drop off the end of the guide bar into the open jaws of the clamping mechanism E.

The rocker arm release mechanism just described is actuated by the cam assembly heretofore indicated generally at G. More specifically, a fixed arcuate cam 23 depends from the primary frame support B. A cam follower in the form of a lever 24 pivoted to the side of the magazine as at 24*a* is actuated through its engagement with the fixed cam when the magazine C is swung inwardly to its position shown in dotted lines in FIG. 1 and in solid lines in FIG. 2. More specifically, the cam follower lever 24 includes a roller bearing 26 which engages and is depressed by the arcuate camming surface of the cam 23 when the magazine C is swung out of its vertical alignment in reference to clamping mechanism E. A linking mechanism including a cam rod 27 is pivotally attached at its upper end to the lever arm of the cam follower whereby when the latter is depressed, the rod is caused to reciprocate downwardly. The lower end of the rod 27, in turn, is connected by a bell crank 28 to the rocker arm 17 previously described. The bell crank 28 functions to convert the reciprocating motion of the rod to rocking motion of the rocker arm whereby the latter is caused to move to its two alternate positions as shown in FIGS. 3 and 4, respectively. A spring 29 interposed between the upper end of the rod and a bracket support 31 functions to normally spring-bias the rod 27 and cam follower lever 24 to their upward positions and which also means that the rocker arm 17 is normally spring-biased to its position in which the snubber 19 is engaged against the lowermost clip as shown in FIGS. 1 and 3.

Recapitulating in part the overall operation of the device, it is seen that when an operator places the neck of a bag (not shown) into the clamping jaws of the mechanism E, his hand will move against the cushioned part 11 of the magazine C causing the guide bar 13 to move out of vertical alignment with the clamping mechanism E. This swinging movement of the magazine will cause the cam follower 24 to move against the cam; and through the aforementioned linking mechanism including the rod 27 and bell crank 28, the snubber end 19 of the rocker arm 17 will move out of engagement with the lowermost clip 16*a* where it will be prevented from freely falling off the bottom end of the guide rod 13 by virtue of the latch end 22 of the rocker arm.

When the clamping cycle is completed and the operator removes his hand from against the lower portion of the magazine, the latter will swing back to vertically aligned position relative to the clamping mechanism E, and this movement will permit the cam follower and rod to again move upwardly whereby the lowermost clip 16*a* is disengaged by the latch 17 of the rocker arm but not until the next in line clip is frictionally engaged by the snubber. From this it will be seen that the release mechanism will function to positively release only one clip at a time from the guide bar 13 to the clamping mechanism E each time the magazine C is swung in and out per each bag clipping operating cycle of the machine.

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 as limited only by the scope of the appended claims.

In the claims:

1. In combination: a vertically disposed guide adapted to carry a plurality of U-shaped clips slidably embracing said guide; a clamping mechanism located adjacent the bottom discharge end of said guide for successively receiving and clamping one at a time the U-shaped clips from said guide; clip release means on said guide for successively releasing only one clip at a time from the bottom end of said guide to said clamping mechanism; said clip release means being mounted a substantial distance upwardly from the lower end of said guide; means for mounting the lower end of said guide for movement into and out of substantial vertical alignment relative to said clamping mechanism; and means operably associated with said release means and actuatable upon movement of said guide to actuate said release means and cause release of a clip off the bottom end of said guide into said clamping mechanism each time said guide is moved to its position of vertical alignment relative to said clamping mechanism, said releasing means being operable directly from said guide mounting means, whereby said clamping mechanism is accessible from any angle.

2. In combination with a vertically disposed guide on which is adapted to be carried a plurality of U-shaped clips slidably embracing said guide, and a clamping mechanism located adjacent the bottom discharge end of said guide for successively receiving and clamping one at a time said U-shaped clips from said guide the improvement comprising: clip release means on said guide for releasing only one clip at a time from the bottom end of said guide to said clamping mechanism, said clip release means comprising a rocker arm pivotally mounted on said guide; the upper end of said rocker arm provided with a clip snubber and the lower portion of said arm provided with a latch; said arm mounted for rockable movement to a first position with the snubber engaging and frictionally retaining against slidable movement the lowermost clip on said guide; said rocker arm movable to a second position with said snubber moved away and out of contact with said lowermost clip and with said latch swung inwardly in the path of movement of said lowermost clip

to restrict further downward slidable movement thereof on said guide; said latch operable to swing outwardly from the path of movement of said lowermost clip upon rockable movement of said rocker arm back to its first position, whereby the latch operates to release for slidable movement off the guide the said lowermost clip only after said snubber has engaged against the next in line clip.

3. The combination of claim 2 and wherein said snubber comprises a resiliently yieldable bearing pad engageable against said lowermost clip when the rocker arm is in its first position.

4. The combination of claim 2 and wherein said guide is pivotally mounted adjacent its upper end to a primary support to permit swingable movement of the lower end of said guide into and out of substantial vertical alignment relative to said clamping mechanism; a fixed cam associated with said primary support; a cam follower mounted on said guide and directly operably connected to said rocker arm; said cam follower actuatable by engagement with said cam when the lower end of said guide is swung to its position out of vertical alignment with said clamping mechanism to cause said rocker arm to move to its said second position; and means associated with said cam follower to cause said rocker arm to move to its said first position when said guide is swung to its vertically aligned position with said clamping mechanism.

5. The combination of claim 4 and wherein said last named means includes spring means normally biasing said rocker arm to its said first position.

6. The combination of claim 4 and wherein link means are provided to operably connect said cam follower with said rocker arm; said link means including a vertically reciprocable rod carried by said guide and attached to its upper end to said cam follower and reciprocable downwardly upon actuation of the latter; a bell crank connecting the lower end of said rod with said rocker arm to convert reciprocable motion of the rod to pivotal rocking movement of the rocker arm, said rod and said bell crank being disposed entirely above the lower end of said guide.



7. A machine for feeding U-shaped clips singly into the jaws of a clamp that closes the clip around the twisted neck of a bag comprising a primary frame extending upwardly from the jaws, a horizontal beam on said frame spaced from the jaws, a magazine feeder depending from said beam, said magazine feeder being pivotally mounted to said beam for swinging movement within and without the clamp jaws, said magazine feeder including a guide bar spaced from said magazine feeder and being adapted for slidably conveying U-shaped clips downwardly therealong, and means for releasing only one clip from the lower end of said guide bar each time said magazine feeder is moved within the clamp jaws, said clip releasing means having a rocker arm pivotally mounted on said magazine feeder, said rocker arm having a latch and a resiliently yieldable snubber, a reciprocable rod for rocking said rocker arm, said rod being disposed along said magazine feeder substantially parallel therewith, a cam follower mounted on said magazine feeder and directly operatively connected to said rod, a cam surface on said horizontal beam, said cam surface being spaced relatively to said cam follower to impart reciprocating motion to said rod when said magazine feeder is swingably moved within and without the clamp jaws, said rocker arm being adapted to release only one clip into the clamp jaws while other clips are retained by said snubber when the magazine feeder is moved within the clamp jaws and to retain clips by said latch when the magazine feeder is without the clamp jaws.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,120,597 | Carper | Dec. 8, 1914 |
| 1,140,090 | Winter | May 18, 1915 |
| 2,738,899 | Hansen et al. | Mar. 20, 1956 |
| 2,907,494 | Ine et al. | Oct. 6, 1959 |