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CLIP CRIMPING APPARATUS

3,015,824

Filed Aug. 18, 1959

2 Sheets-Sheet 1

FIG. 1.

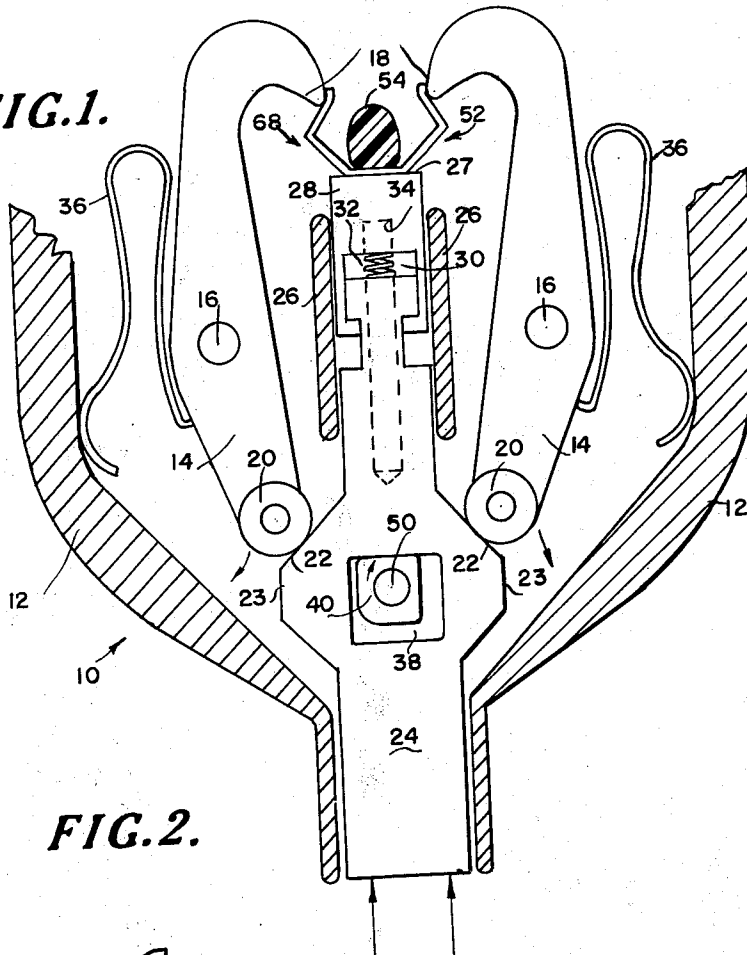
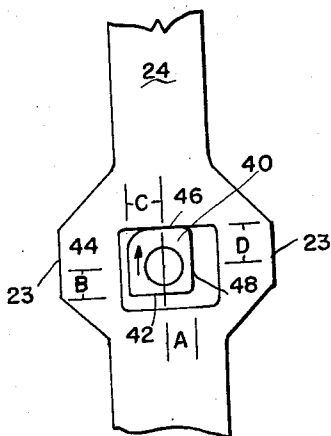


FIG. 2.



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FIG. 3

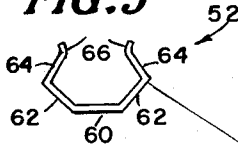


FIG. 4.

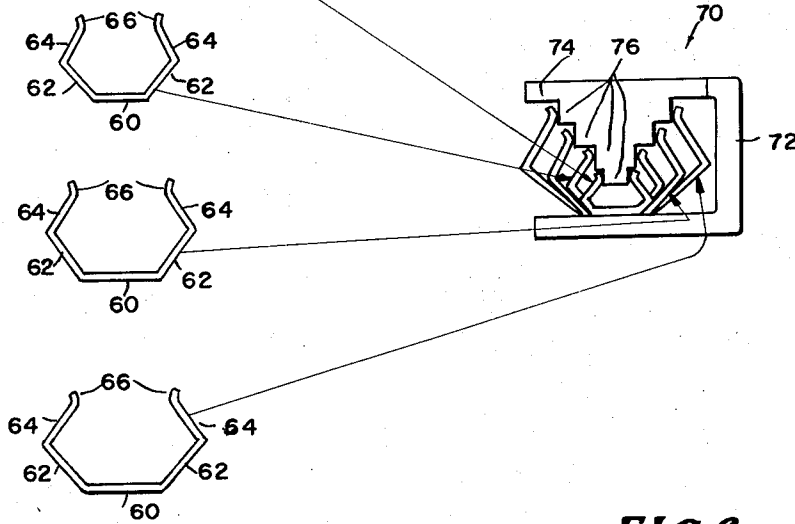


FIG. 5.

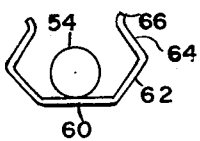


FIG. 6.

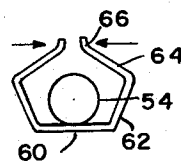


FIG. 7.

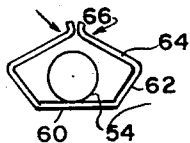
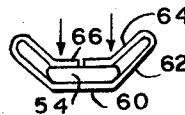


FIG. 8.



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CLIP CRIMPING APPARATUS

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6 Claims. (Cl. 1—329)

This invention relates to an adjustable crimping head for clip crimping apparatus, and more particularly to a clip crimping head which may be readily adapted to receive varying sizes of generally U-shaped deformable sealing clips for the twisted necks of flexible containers and the like.

This invention also relates to novel clip, or fastening device, and a novel clip feed track which may accommodate a plurality of different size clips used in conjunction with the crimping head.

For some time it has been recognized that the sealing of food, meat in particular, in impermeable flexible plastic containers from which air has been exhausted, produces a superior product and package. Many apparatus have been devised to effectively seal collapsible plastic containers, such as the machine disclosed in United States Patent No. 2,733,442. This invention in particular relates to an improvement over such devices, and specifically relates to means for controlling the amount of crimping so that a single crimping head may effectively operate upon different size clips without entailing any structural modification. In the past it has always been necessary to employ a different crimping head and crimp feeding track when substituting one size clip for another.

The present invention eliminates this problem as a single crimping head may be adjusted to accept and crimp any size clips used in closing plastic bags. This invention provides for an active tie between the cam and nest elements of a crimping head. By relating these parts, it is possible to vary the opening of the clipping jaws and nest in a definite relationship to accommodate different sizes of clips.

This invention further provides for a single track capable of feeding up to four different sizes of clips, thus eliminating the necessity of changing the track whenever the clip size is changed.

It is a purpose, therefore, of this invention to provide a new and useful clipping head for package sealing machines in which a single crimping head may be easily adjusted to effectively accommodate the various size of clips.

It is a further object of the present invention to provide a new and useful U-shaped deformable sealing clip employed by the crimping head of the present invention.

Still another object of the present invention is to provide a clip feeding track capable of accommodating at least four different sizes of clips in conjunction with an adjustable crimping head.

These and further objects and advantages will be readily apparent to those skilled in the art upon reading the following detailed description taken in conjunction with the appended drawings in which

FIG. 1 is a partial cross-sectional plan view of the adjustable crimping head;

FIG. 2 is a fragmentary view of the plunger and and plunger limiting means;

FIG. 3 is a plan view of clips embodying the features of this invention;

FIG. 5 is a cross-sectional view of the clip feed track; and

FIGS. 5 to 8 are plan views of the clip of the present invention illustrating the crimping steps.

A preferred embodiment of the adjustable crimping head of the present invention, which may be readily associated with package sealing machines and in particular the machine disclosed in United States Patent No. 2,733,442,

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is best illustrated in FIG. 1 and comprises a casing 10, which may be attached to the package sealing machine in the usual manner, and having substantially arcuate-shaped side walls 12, and the usual top and bottom closure members (not shown). A pair of opposed crimping jaws 14 are pivotally mounted within the casing, as by the pivot pins 16, and have rearwardly and inwardly extending crimping portions 18 disposed at their outer ends, with the other ends provided with cam followers 20 adapted to ride along opposed cam faces 22 of plunger 24. The flat parallel cam surfaces 23 on plunger 24 will allow plunger 24 to urge punch 28 toward the crimping portion 18 of jaws 14 in the clip receiving nest without causing the crimping portions 18 to move toward each other. This motion completes the tightening of the crimp in the clip 52. Plunger 24 is slideably mounted and extends longitudinally between the crimping jaws 14, and is guided at its ends by longitudinally extending guides 26 mounted inwardly on the casing closure and the side walls 12. A floating punch 28 is carried by the upper end of the plunger 24 and is adapted for limiting sliding motion relative thereto, as by T-slot connection 30, or any other suitable lost-motion connection. Plunger 24 is longitudinally bored at its upper end to receive a coil spring 32, one end of which is disposed within the bore 34 of the floating punch 28 to continually urge it toward the crimping portions 18 of jaws 14 defining a clip-receiving nest. Leaf springs 36 are disposed between and in engagement with the crimping jaws 14 and side walls 12 of the casing to normally urge the crimping portions 18 of the jaws into open position.

The plunger 24 is provided with a substantially square slot 38 near its lower end and disposed centrally between cam faces 22. A multi-faced cam 40 is eccentrically disposed within the slot 38 and has, preferably, four faces, 42, 44, 46 and 48, and is adapted to be rotated within the slot 38 as by the pin 50. Any suitable means may be attached to the pin 50 in order to rotate the cam 40 within the slot 38. As best shown in FIG. 2, the cam 40 is substantially square in plan and is eccentrically mounted about the pin 50 so that each of the cam faces 42 through 48 extend a different distance, A, B, C and D, from the center of rotation of the pin, with the cam face 42 being the nearest to the center of rotation and the cam face 48 being the furthest from the center of rotation. It is to be understood that the number of faces of cam 40 may be varied in accordance with the number of sizes of clips to be employed with the crimping head. Four have been illustrated here, in that the invention also discloses a feeding track for clips, which feeding track is adapted to carry four different sizes of clips, by way of illustration only.

In normal operation, the plunger 24 is caused to move longitudinally toward the crimping portions 18 of the crimping jaws by any suitable actuating mechanism, such as a hydraulic cam, mechanical lever, or the like, normally employed in a bag-sealing machine. As the plunger 24 is caused to move (FIG. 1), cam followers 20 co-operating with the cam faces 22 of the plunger 24, cause the jaws 14 to pivot about the pins 16; whereupon the crimping portions 18 of the jaws move toward each other to act upon a clip, indicated generally as 52, to crimp it about the twisted neck 54 of a bag to effect the proper seal. However, by adjusting the cam 40, the amount of movement of the plunger 24 may be limited and, accordingly, the degree of crimping by the jaws 14 may similarly be varied by restricting their pivotal motion. Thus, if a large clip is to be employed, the crimping portions 18 of the jaws 14 must move a greater distance relative to each other than if a smaller clip were to be employed. Therefore, cam 40 is turned so that the cam face which is nearest to the center of rotation of the pin 50, in this

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case cam face 42, is opposite the rear wall 56 of the slot 38, so that the movement of the plunger 24 relative to the cam 40 is the greatest. As the floating punch 28 is continually spring-urged toward the crimping portion 18 of the jaws 14, no matter how the cam 40 is positioned, the clip 52 is always firmly engaged by the crimping portions 18 and the floating punch 28. If it is desirable to use a smaller clip, the cam 40 is appropriately positioned to restrict the movement of the plunger 24 by selecting one of the cam faces 42, 44, 46 and 48 which properly corresponds with the selected size of the clip.

The preferred clip 52 to be employed with the crimping head of the present invention is best disclosed in FIG. 3. The clip 52 comprises a substantially flat base portion 60 having lower arm portions 62 extending upwardly and outwardly at an obtuse angle from its ends. Upper arm portions 64 extend upwardly and inwardly from the upper ends of lower arm portions 62 at substantially a right angle therefrom. The upper arm portions 64 are substantially of the same length as the lower arm portions 62 and have outwardly and upwardly extending portions 66 at their free ends, substantially at a right angle thereto. It is to be understood that although the overall size of the clip may vary, and as here shown in four sizes, the relative dimensions of each size clip are approximately the same.

During the operation of the crimping head, the clip 52 progressively assumes the positions indicated in FIGS. 5 to 8, with the position of FIG. 5 being the first, and that of FIG. 8 being last. With the clip 52 in place in the clip-receiving nest, formed by crimping portions 18 and floating punch 28 of the crimping head, it assumes the position illustrated in FIGS. 1 and 5 relative to the bag neck 54. As the plunger 24 moves toward the clip 52, the crimping portions 18 are caused to pivot inwardly about the pivot pins 16 through the action of cam faces 22 and the cam followers 20, so that the clip assumes the configuration illustrated in FIG. 6.

As soon as the lost motion between the plunger 24 and floating punch 28 has been utilized, floating punch 28 cooperates with crimping portions 18 so that the upper arm portions 64 of the clip 52 are bent about the lower arm portions 62 into engagement with the bag neck 54 until the clip has assumed the configuration illustrated in FIG. 7, to collapse the arms 62 and 64 of the clip so that it assumes the configuration illustrated in FIG. 8, the positive final engagement with the bag neck 54. After the clip 52 has been completely crimped, plunger 24 moves away from crimping portion 18 and the leaf springs 36 operate to pivot the jaws 14 to an open position in order that a new clip be inserted for another crimping operation.

The preferred embodiment of the feed track adapted to accommodate four different size clips of the present invention is best illustrated in FIG. 4. Normally the feed track, indicated generally as 70, is disposed adjacent a usual clip retainer 72 of the bag-sealing machine and comprises an elongated backing strip 74 having a substantially rectangular cross-sectional configuration. A plurality of longitudinal clip guides 76, one for each size of clip, each having a substantially cross-sectional configuration, are disposed in a pyramidal relation with the guide 76 having the largest cross-sectional configuration disposed adjacent the backing strip 74. The sides of the clip guide 76 are engaged by the inner ends of the upper portion 64 of the clip 52 to guide the clips carried thereby.

It is to be understood that the clip track 68 may be secured to the bag-sealing machine so that the clips carried thereon will pass about the customary clip wheel, separator block, and feed pawls to feed a continuous strip of clips to the clip-receiving nest of the crimping head in the usual manner. Alternatively, the clips may be bulk fed into the crimping apparatus, if desired.

The forward surface 27 of punch 28 may have marking

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die means thereon so that the pressure of crimping the clip 52 into closed portion will transfer the design or lettering to the outer surface of the clip base 60. Such identifying mark is useful for indicating the processing plant, process, machine or operator connected with the product packaged.

The largest size bag recommended for use with each size clip will completely fill the void included by the crimped arms 62 and 64. The smallest size bag recommended for use with each size clip will fill only a portion of the void formed by the crimped arms 62 and 64 as shown in FIGURE 8.

It will thus be seen that there has been provided by this invention devices in which the various objects hereinbefore set forth, together with many practical advantages, are successfully achieved. As various possible embodiments may be made of the mechanical features of the above invention, all without departing from the scope thereof, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. An adjustable crimping head for clip crimping apparatus for applying generally U-shaped deformable sealing clips to the twisted necks of flexible containers, comprising: a casing; a pair of opposed crimping jaws pivotally mounted in the casing and having rearwardly and inwardly extending crimping portions; a plunger slideably mounted between the jaws and having opposed cam faces adapted to pivot said crimping jaws; a floating punch slideably mounted for limited motion within the casing and adapted to engage said plunger; said punch being spring urged toward the crimping portions of said crimping jaws defining a clip receiving nest; and means within said casing to vary the pivotal motion of said crimping jaws.

2. An adjustable crimping head as defined in claim 1 wherein said means to vary the pivotal motion of said crimping jaws comprises a variable stop member to limit the sliding motion of said plunger and therefore the pivotal motion of said crimping jaws.

3. An adjustable crimping head as defined in claim 2 wherein said variable stop member comprises a multi-faced cam adapted to engage a portion of said plunger to variably limit its sliding motion.

4. An adjustable crimping head as defined in claim 1 wherein said means to vary the pivotal motion of said crimping jaws comprises a substantially square slot in said plunger, a multi-faced cam disposed within said slot and journaled in said casing, the faces of said cam being adapted to selectively engage a side of said slot to limit the stroke of said plunger.

5. An adjustable crimping head as defined in claim 1 wherein the said punch has die means on its operating face in order to mark the base of the clip simultaneous with crimping.

6. An adjustable crimping head for clip crimping apparatus for applying generally U-shaped deformable sealing clips to the twisted necks of flexible containers, comprising: a casing; a pair of opposed crimping jaws pivotally mounted in the casing and having rearwardly and inwardly extending crimping portions; said crimping jaws being normally spring-biased in an open position; a plunger slideably mounted between the jaws and having opposed cam faces adapted to pivot said crimping jaws; a floating punch slideably mounted for limited motion within the casing adapted to engage said plunger; a substantially square slot in said plunger, a multi-faced cam disposed eccentrically within said slot and journaled in said casing, the faces of said cam being adapted to selectively engage a side of said slot to limit the sliding motion of said plunger; said punch being spring urged toward the crimping portions of said crimping jaws, defining a clip receiving nest.

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