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F. G. PAXTON

3,164,249

BAG CLOSURES UNITED IN STRIP FORM

Filed March 7, 1961

FIG. 1

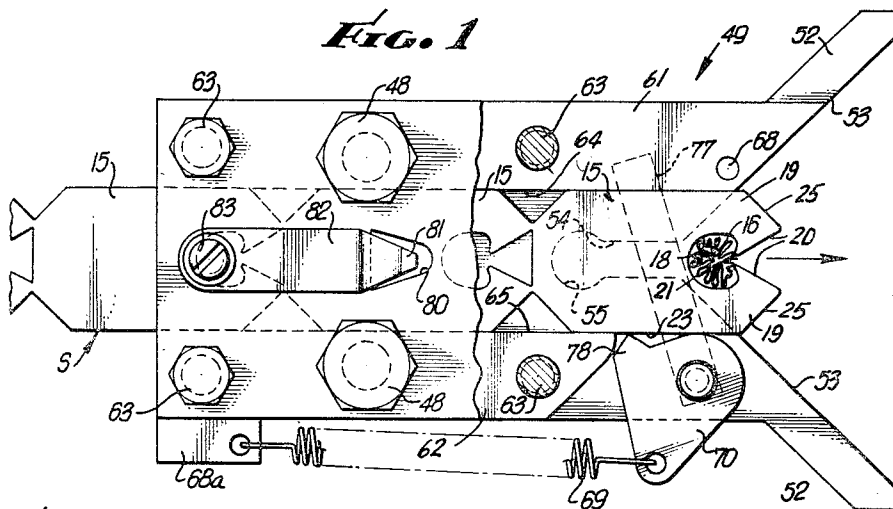


FIG. 5

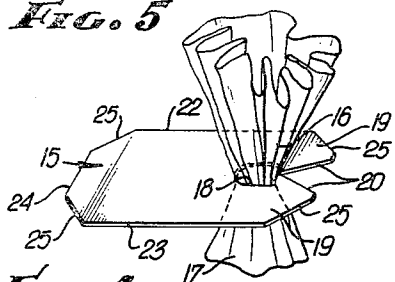


FIG. 2

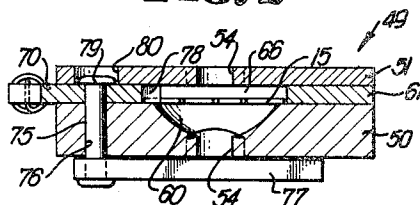


FIG. 4

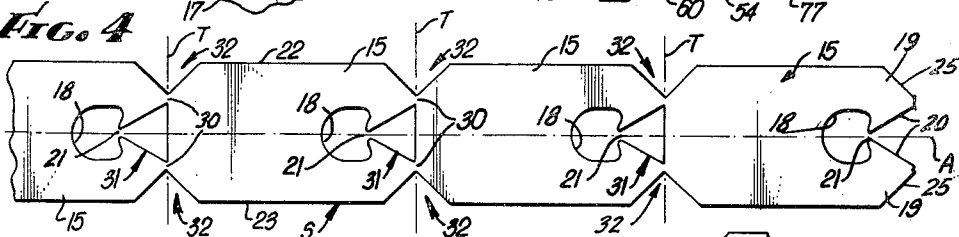
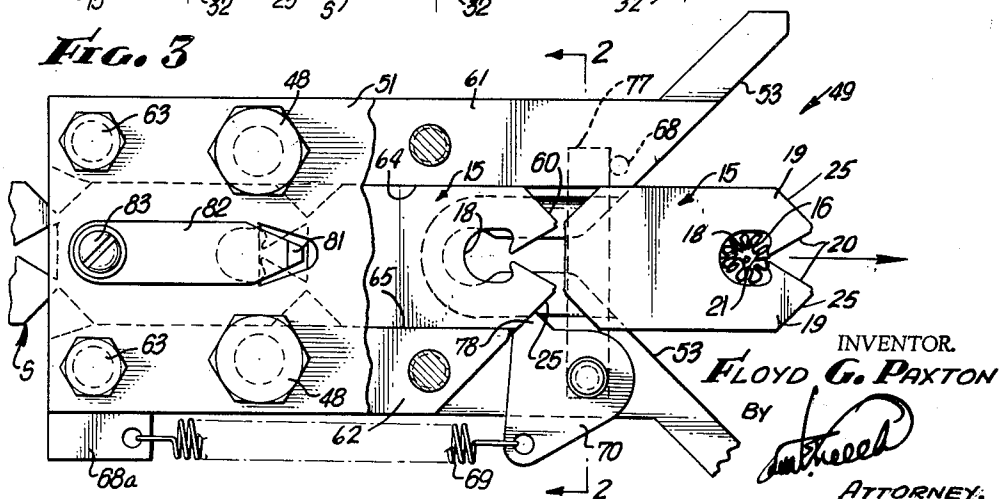


FIG. 3



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BAG CLOSURES UNITED IN STRIP FORM
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3 Claims. (Cl. 206—56)

This invention relates to bag closures and particularly to the arts of producing such bag closures and dispensing the same for application to flexible bags.

Bag closures of the general type sold under the trademark "KWIK LOK" by KWIK LOK Corporation, Yakima, Washington, comprise a sheet of relatively stiff but springy plastic material $\frac{7}{8}$ of an inch wide, $1\frac{3}{8}$ inches long and about .011 inch thick with a bag-neck-receiving mouth formed therein between two closely spaced co-planar jaws with diverging lips. The neck of a partially filled flexible plastic bag is adapted by any of several methods to be introduced between said jaws so as to be compactly trapped in said mouth, thus closing the bag. The "KWIK LOK" closure, and two methods of and a machine for applying the same to close a flexible bag is shown in my U.S. Patent No. 2,705,100.

Bag closures of the "KWIK LOK" type have heretofore been manufactured by punching these from a strip of plastic sheet material $\frac{7}{8}$ of an inch wide, and packaged as individual separate closures stacked in column form. These columns have been conveniently held together by metal straps inserted through the mouths of the closures in each column and the latter then transferred from these straps to magazines of dispensing machines designed for applying the individual closures to flexible bags.

One of the major problems in heretofore dispensing "KWIK LOK" type closures to present the same individually for application to flexible bags was the need for feeding these closures edge to edge from the lower end of a magazine holding a vertical column of closures. Adjacent closures being thus fed tended to become overlapped and thus jam the dispenser.

It is an object of this invention to provide said closures in the form of a continuous strip that may be rolled up on a reel without the resulting bending breaking the closures apart and yet in which the tractive force produced by pulling on a plastic bag neck trapped in the mouth of the endmost closure will separate said closure from the strip.

Another object of the invention is to provide such a strip which is adapted for lengthwise feeding from a reel to bring the closures thereof respectively into position to receive a bag neck and in which means is provided along side edges thereof for temporarily halting forward movement of each individual closure, when it becomes the second closure in the strip, to facilitate the pulling of the foremost closure therefrom as aforesaid.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which

FIG. 1 is a plan view of a closure dispenser and illustrates the start of the withdrawal of the foremost closure from the dispenser by withdrawing the bag, the neck of which is trapped in the mouth of said closure.

FIG. 2 is a cross-sectional view taken on the line 2—2 of FIG. 3.

FIG. 3 is a view similar to FIG. 1 and illustrates the separation of the foremost closure from the strip of closures with which it had theretofore been integrally embodied.

FIG. 4 is a full scale view of a preferred form of the strip of bag closures of the invention.

FIG. 5 is a fragmentary perspective view illustrating a bag closure of the present invention after it has been ap-

plied to the neck of a plastic bag and then separated from the strip in which it is originally formed.

Referring specifically to the drawings and particularly to FIG. 5, a bag closure 15 is here shown applied to the bunched neck 16 of a plastic bag 17 so as to close the later. The closure 15 represents a preferred form of the "KWIK LOK" type of closure which it is the primary object of the present invention to produce and effectively apply to plastic bags for closing the same as shown in FIG. 5. The closure 15 is formed of flat sheet material of relatively stiff but springy plastic and is about $\frac{7}{8}$ of an inch wide, $1\frac{1}{2}$ inches long and about .032 inch thick with a bag-neck-receiving mouth 18 formed therein between two closely spaced co-planar jaws 19 with diverging lips 20 which diverge outwardly from a narrow passage 21 which separates the jaws 19 and affords entrance to the mouth 18.

Each closure 15 is formed symmetrically about its axis lengthwise with the mouth 18 and jaws 19 located at the right or forward end of each closure as these are illustrated in the drawings. Each closure 15 has parallel side edges 22 and 23, a transverse back edge 24 and angled corner edges 25 which preferably are disposed at angles of 135° relative to the side edges 22 and 23.

The invention includes a novel method of economically producing closures 15 so that a multiple of these closures are united end to end in strip form, as in a strip S, a preferred form of which is shown in FIG. 4. The connection between contiguous closures 15 in strip S is temporary and intended to be pulled apart to separate the foremost closure in the strip from the balance of the closures therein when applying the foremost closure to a bag 17.

In this method the preferred manner of partly connecting contiguous closures in strip S is to die-cut the closures 15 out of a continuous plastic tape of the same width as the closures 15 so as to leave certain partible portions 30 of the tape in the form of a pair of webs integrally connecting adjacent closures. The partible portions or webs 30 lie in transverse planes T which mark the front and back ends of contiguous closures. Each plane T contains the back edge 24 of the closure 15 and this back edge forms the front boundary of a keyhole shaped hole 31 which forms the bag-neck-closing mouth 18, the passage 21 and the diverging lips 20 of the jaws 19 of the closure 15 in which this hole is formed. Also formed in each die-cutting operation is a pair of like triangular notches 32 which are cut from side edges 22 and 23 symmetrically with the planes T. The apices of notches 32 thus lie in planes T and are directly adjacent the webs 30 of the strip S which unite contiguous closures 15. These notches also form the corner edges 25 of the closures 15. Successive die-cutting operations in forming the strip S are preferably performed in a punch press in which the blank tape from which the strip S is to be formed is fed automatically $1\frac{1}{2}$ inches at timed intervals, each of these movements taking place between successive die-cutting operations.

The strip S travels intermittently, between die-cutting operations, in a direction from right to left as this strip is illustrated in FIG. 4. In other words this movement is in a reverse direction to that in which the strip travels incidental to the application of individual closures 15 to flexible bags 17.

A closure dispenser head 49 is provided which includes a bottom plate 50 which is relatively thick, and a top plate 51 which is relatively thin, these plates being identical in plan outline. This plan is fairly well shown in FIG. 1, with each plate being rectangularly shaped at the left end and provided with guide arms 52 at the right end, these arms having interior converging guide faces 53 which terminates at their inner ends at side walls of a slot 54

which extends a short distance longitudinally into the plate and terminates in an enlarged circular end portion 55. In addition to having the features above described in common with plate 51, plate 50 has its upper flat surface tooled away adjacent the slot 54 as shown in FIGS. 2 and 3 to provide an elongated cup-shaped recess 60, the purpose of which will be made clear hereinafter.

Plates 50 and 51 are held in spaced relation by spacer plates 61 and 62 which are shaped in plan as shown in FIG. 3 all of the aforesaid plates being provided with suitable aligned holes for receiving the bolts 48 and four bolts 63 which hold these plates in rigidly assembled relation. Plates 61 and 62 have parallel inner edges 64 and 65 which cooperate with the lower surface of plate 51 and the upper surface of plate 50 to form a straight closed guideway 66 for closure strip S, entrance of strip S to said guideway being facilitated by chamfered end portions 67 of edges 64 and 65. The front end of plate 61 conforms to the adjacent guide face 53 and this plate and bottom plate 50 have aligned holes for receiving a pin 68 which extends downwardly a short distance below plate 50. Plate 62 has a short spring anchor arm 68a on which one end of a contractile spring 69 is anchored. The front or right end of plate 62 terminates to provide a flat open space between bottom and top plates 50 and 51 to accommodate a rockable latch 70 which is fixed to the upper end of a shaft 75 which journals in a suitable hole provided in bottom plate 50 and has fixed to the lower end thereof an arm 77 which is long enough to engage pin 68 when the latch 70 is rotated in a clockwise direction. Latch 70 extends laterally beyond the adjacent edge of bottom plate 50 and has the other end of spring 69 connected thereto which normally rocks latch 70 to swing arm 77 into contact with pin 68 as shown in FIG. 3. When the latch is so positioned, a stop lug 78 provided on latch 70 extends inwardly past edge 65 of plate 62 into guideway 66 and into the path of a closure strip S being fed along said guideway. The upper end of shaft 75 may have a head 79 (FIG. 2) which may have a hole 80 provided in plate 51 to accommodate this. The stop lug 78 is adapted to be swung laterally out of guideway 66 by engagement of the arm 77 from the front as shown in FIG. 1 so as to swing said arm rearwardly out of contact with stop pin 68.

As shown in FIG. 2, guideway 66 may be considerably deeper than the thickness of a closure strip S, but this guideway is only slightly wider than said strip so as to confine the latter closely in a lateral direction to the straight path formed by said guideway. The cup-shaped recess 60 is somewhat narrower than guideway 66 so as to leave marginal areas 79 of the flat upper surface of plate 50 between recess 60 and lateral side faces 64 and 65 of passageway 66.

Provided centrally in top plate 51 is a hole 80 for receiving a backstop 81 mounted on the front end of a light leaf spring 82 the rear end of which is secured to plate 51 by a screw 83. The spring 82 lightly urges the backstop 81 downwardly so that when this is not held up by engagement with an upper surface of a closure strip S it rests on the flat upper surface of bottom plate 50 as shown in FIG. 3.

Operation

As above noted, the closure dispenser 49 receives one end of the closure strip S and provides a means for performing the final step of producing individual bag closures 15 and applying these to the necks 16 of flexible bags 17 for closing the latter. The dispenser 49 is mounted in a rigidly fixed position. When a bunched bag neck 16 is held vertically and pressed into the dispenser 49 it is guided by surfaces 53 and slot 54 into engagement with the diverging faces of jaws 19 of the foremost closure 15 so as to flex these downwardly thereby increasing the spacing of these jaws and permitting the bunched bag neck 16 to enter the closure mouth 18. As the bunched bag neck

is thus manually advanced into the dispenser 49 it engages arm 77 and rotates the rockable latch 70 to withdraw stop lug 78 from its normal position blocking withdrawal of the foremost closure 15. Completion of the delivery of the bunched bag neck 16 into the closure mouth 18 thus frees the foremost closure 15 for withdrawal forwardly merely by pulling forward on the back neck. This not only withdraws the foremost closure 15 from the dispenser 49 but pulls the closure strip S further into said dispenser so as to move the next closure to the foremost closure into the position of the latter as shown in FIG. 3.

An intermediate step in the withdrawal of the foremost closure is shown in FIG. 1, wherein it is noted that as the bunched bag neck 16 leaves contact with the arm 77 the stop lug 78 comes to rest on the right side edge 23 of the foremost closure 15 and rides on this edge during the balance of the movement of withdrawing the foremost closure from the dispenser. As soon as this withdrawal brings the right hand notch 32, located between the foremost and next closures of the strip S, opposite the stop lug 78, the tension of the spring 69 swings the latch 70 to bring the arm 77 against stop pin 68 and extend stop lug 78 into guideway 66 and into the aforesaid notch 32 so as to be engaged by the adjacent corner edge 25 of the next closure 15 in said strip. This causes the next to the foremost closure 15 to be suddenly halted while the foremost closure 15 is still being withdrawn from the dispenser by pulling on the bag neck 16 trapped in the mouth of said closure. The webs 30 of the strip S connecting the foremost closure with the closure next thereto are thus pulled apart (FIG. 3) thereby completing the production of a separate closure 15 after this has been applied to the bunched neck of a plastic bag 17 in closing relation with the latter.

The closure 15 formerly referred to as the next to the foremost closure is now the foremost closure in strip S and occupies the same position in head 49 as the closure just pulled from strip S formerly occupied. This new foremost closure is thus in readiness for a repetition of the steps just described for the application of a bunched bag neck 16 thereto and the subsequent separation of said closure from the balance of the multiple closure strip S.

In handling the strip S, of course, care must be taken not to bend this at too sharp an angle as this tends to cause the untimely parting of the webs 30 of the strip which unite adjacent closures.

What is claimed is:

1. A matrix in strip form for consecutively producing a series of bag closures comprising a strip of relatively thin and stiff but springy flat sheet plastic material, said strip being weakened at regularly spaced longitudinal intervals along a transverse line normal to the side edges of said strip by means eliminating the material of said strip bordering said transverse line, with the exclusion of a pair of narrow webs located on said line, said means including a hole bordering said line and having opposite extremities located on said line, said webs being readily frangible upon the imposition of a moderate amount of traction to said strip on opposite sides of said line to separate said strip along said line, said strip having, adjacent each of said holes, an internal aperture which communicates with said hole through a narrow passageway, whereby the separation of said strip along a given line as aforesaid, converts the portion of said strip adjacent said line having said aperture into a bag closure.

2. A matrix in strip form for consecutively producing a series of bag closures as recited in claim 1, wherein said strip is coiled in such a direction that when said strip is separated along any of said transverse lines as aforesaid, as said strip is being unwound from said coil, a closure is formed as aforesaid on the part of said strip remaining on said coil.

3. A strip of relatively thin and stiff but springy flat sheet plastic material, said strip being weakened at regu-

larly spaced longitudinal intervals along a transverse line normal to the side edges of said strip by a hole bordering said transverse line and having opposite extremities located on said line, and by two notches, one in each of said side edges, with the apices of said notches lying in said line and spaced respectively from said extremities by two narrow webs of unbroken sheet plastic, which webs are readily frangible upon the imposition of a moderate amount of traction to said strip on opposite sides of said line to separate said strip along said line, said strip having adjacent each of said holes an internal aperture which communicates with said hole through a narrow passage, whereby the separation of said strip along a given line as aforesaid converts the portion of said strip adjacent said line having said aperture into a bag closure.

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