METHOD AND APPARATUS FOR OPENING, FILLING AND CLOSING OF BAGS

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Filed Nov. 25, 1968, Ser. No. 775,419
Claims priority, application Sweden, Nov. 28, 1967, 16,331/67
Int. Cl. B65b 01/14

UNITED STATES PATENT OFFICE

3,543,466
Patented Dec. 1, 1970

ABSTRACT OF THE DISCLOSURE

Plastic hose is cut into sections of desired height, and each section is sealed at the bottom to form a bag. The bag is held in a flat upright position while strips of pressure-sensitive labels are fed to both sides of the bag on two carrier bands. Labels are glued to opposite sides of the bag at its upper end, with portions of the labels projecting above the opening end of the bag. The bag is then opened by using the projecting portions of the labels to pull the opposite sides of the bag apart. The bag is filled, and the projecting portions are released from their carrier bands and pressed against each other above the bag opening so as to close the bag.

BACKGROUND OF THE INVENTION

This invention relates to a method and apparatus for opening, filling, and closing of bags, and more particularly to the use of strips of adhesive material as a mechanical means for opening a bag before it is filled, and then closing the bag by using the adhesive strips as a seal.

At the present time, synthetic resins such as polyethylene and other transparent plastic materials are widely used in the flexible packaging market. The conventional method for opening, filling, and closing a polyethylene bag includes using a suction cup or the like for opening the bag, and applying a transverse heat seal to close the top of the bag after it is filled. Labels are applied to the bag in a separate operation, usually at the beginning of the process.

This invention makes it possible to continuously feed bags to a filling apparatus and to apply labels to the bag in one simple operation. Adhesive strips, preferably pressure-sensitive labels, are applied to the sides of the bag, and then the adhesion of the strips to the bag is used to pull the bag open for filling. The upper portions of the strips projecting above the bag opening are pressed against each other to close the bag after it is filled. No suction cup or its equivalent for opening the bags is required, and problems of product identification are eliminated.

SUMMARY OF THE INVENTION

In terms of method, this invention contemplates applying two adhesive strips to the sides of an upright bag at its opening end. The strips are applied so that their upper portions reach above the opening end of the bag without being pressed against each other. The bag is opened by using the projecting adhesive strips to pull the sides of the bag apart. After the bag is filled, it is closed by pressing the projecting adhesive strips against each other. The adhesive strips preferably comprise pressure-sensitive labels dispensed from carrying bands during the continuous feeding of bags to a filling apparatus. In order to facilitate suspending filled bags from horizontal carrying pins in a shop or market, holes are pierced through the adhesive strips and the bag walls.

In terms of apparatus, this invention contemplates a device for holding a bag in an upright position with its opening ends situated below a filling opening. Two spaced-apart dispensing edges support carrying bands which are fed over the edges. The bands carry successively-arranged adhesive strips, preferably pressure-sensitive labels. A means is provided for pressing the adhesive strips against the sides of the bag in the vicinity of its opening end so that upper portions of the strips project above the bag and remain stuck to the carrying bands. A carriage moves at least one dispensing edge away from the other to open the bag before it is filled. A means is provided for releasing the projecting portions of the strips from their carrying bands and pressing them against each other above the opening of the bag to seal the bag.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, an elongated cylindrical carriage 2 is mounted in the upper portion of the machine frame 1. Carriage 2 supports a storage roller 3 preferably comprising a hose of a transparent synthetic resin such as polyethylene. A plastic hose 6 is fed through a heating element 4 for applying a transverse heat seal 5 (FIG. 6) across the hose. A blade 7 is situated so as to receive the hose after the heat seal has been applied. The blade cuts the plastic hose in a transverse direction into pieces of equal length corresponding to the height of a bag 8.

Two substantially identical label-feeding devices 9 and 10 are mounted in the central portion of the machine with a space between them at 11. The two devices cooperate to feed strips of pressure-sensitive labels to the location 11 where bags are opened, filled and closed. The strips of labels preferably comprise a plurality of consecutively-arranged self-adhesive labels mounted on a backing strip carrying band. Feeding apparatus 9 includes a carriage 18 slideable back and forth in a horizontal direction. The carriage 18 supports a storage roller 19 for a strip of labels 21 conveyed on a carrying band 22. The carrying band 20 with the labels 21 is fed on the underside of a plate 22 over a roller 23 so that the labels 21 are carried on the underside of the band. The carrying band 20 moves over a dispensing edge 24 which strips the labels from the carrying band so that the labels are released one by one from the band. The body 18a of the carriage 18 supports plate
A bell crank 26 is journaled about the shaft 25, and one arm 27 of the bell crank is connected to the frame 18 of an electrical magnet 29. Another arm 30 projecting from the bell crank 26 carries a roller 31 for pressing a label 21 against the bag 8 after the label is released from the carrying band 20. A roller 32 is mounted on the carriage 18 for reeling the carrying band 20 and releasing from the labels 21.

The label feeding apparatus 10 cooperates with feeding apparatus 9 to convey labels to location 11, and is constructed in substantially the same manner as feeding apparatus 9, except that it is mounted in a stationary fashion on the stand 1. Consequently, feeding apparatus 10 has no carriage 18 displaceable back and forth.

A V-shaped bag support 14 is used to hold the bag in an upright position during the filling and closing sequence. The bag support 14 comprises a pocket shaped as a funnel, the pocket being displaceable vertically in three steps. FIG. 2 shows the upper step wherein the bag 8, having arrived through a chute 33 from the cutting device 7, is held in an upright position for filling. FIG. 3 shows the intermediate step wherein the bag opening is closed and a hole is pierced through the upper portion of the bag. In the lower step, the bag is discharged after it is filled and closed. The pocket formed by the bag support 14 has a discharge flap 35 journaled about a horizontal shaft 34. The flap 35 includes an arm 36 extending beyond the shaft 34. A stop means 37 is set in the vertical displacement path of the arm 36. The stop 37 is preferably adjustable in the vertical direction. When the bag support 14 is moved to the lowest of three displacement steps, the arm 36 strikes the stop 37, forcing the arm 36 and the flap 35 to be swung in a counter-clockwise direction according to the drawings so as to open the pocket. A piercing apparatus 15 mounted below location 11 comprises a mandrel 38 and a cushioning means 39 mounted opposite the mandrel 38. The mandrel and cushioning means are mounted on respective slides 41 and 42 slidably mounted on a horizontal guide 40. A rocker arm 43 is linked to the slides 41 and 42 by means of rods 44 and 45. The slides are moved toward or away from each other during the piercing operation so that a hole 46 (FIG. 5) is pierced through the upper portion of the bag.

When a bag 8 is separated from the plastic hose 6 by the blade, the bag falls into the bag support 14 which holds the bag in an upright position as shown in FIG. 2. The bag is sufficiently stiff to remain in the position shown. If the bag material is not sufficiently stiff, a means is provided for reinforcing the walls of the bag above the bag support 14. While the bag is held in an upright position, the carrying bands 20 carry their labels to location 11 so that the lower portions 47 of the labels are slightly below the upper end of the bag. When the machine is in this position, the upper portions 48 of the labels are still stuck to their respective carrier bands 20. The carriage 18 is then driven to the left according to the drawings by means of a motor 16 schematically illustrated in the lower left-hand portion of FIG. 1. The label 21 of the feeding apparatus 9 is a partly released and pressed against the upper portion of the adjacent side wall 49 of the bag 8. The opposite side wall 50 of the bag is concurrently pressed against a partly released label 21 carrying on feeding apparatus 10. Thus, the two labels 21 are applied to the upper outer portion of the bag at its opening end 51. The carriage 18 and feeding apparatus 9 are then driven to the right, causing the walls 49 and 50 to pull apart at the opening end 51 of the bag because the upper border portions 48 of the two labels 21 are stuck to their respective carrier bands 20. The bag 8 is then filled through the filling opening 12 located directly above location 11. After the bag is filled the carriage 18 is again driven to the left. The bag support 14 is lowered one step and at the same time the two arms extending from bell crank 26 are swung so that the rollers 31 press against the upper projecting portions 48 of the labels attached to the bag. Movement of the two levers 26 results from the attraction from the armatures 28 of the electrical magnets 29. During the lowering of the bag 8, the two projecting portions 48 of the labels are glued to each other by the pressing action of the rollers 31, thereby creating a transverse seal across the upper part of the bag. After the bag has been closed, the lower portion 7 of the labels 21 are positioned in front of the punch 38 and cushioning means 39 of the piercing apparatus 15. The slides 41 and 42 are moved toward each other and the punch 38 is passed through the labels and the bag walls to form a hole 46. The bag support 14 is further lowered and the arm 36 strikes the stop 37. This causes the flap 35 to be swung in a counter-clockwise direction so that the bags can slide on a guide sheet 52 down into a container 17 located directly below the guide sheet.

The various parts of the machine below the blade 7 return to their original position, and when a new bag is thereupon cut from the hose 6, the sequence of events described is repeated. This invention also contemplates a means for feeding bags from a pile or the like one by one to the bag support 14. Thus, the bags do not have to be cut from a hose or plastic material. The preferred hose of bags blanks may comprise a material other than synthetic resin.

This invention has been described for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

1. A method for opening, filling, and closing of bags, the method comprising the steps of applying at least two adhesive strips to opposite sides of a bag near its opening end so that portions of the strips project above the opening without being pressed against each other, pulling the projecting portions of at least one strip to separate opposed sides of the bag, filling the bag after it is opened, and closing the bag by pressing the projecting portions of the strips against each other.

2. The method according to claim 1, wherein the adhesive stripes comprise pressure-sensitive labels.

3. The method according to claim 1, including the step of piercing at least one hole through the adhesive strips and through the bag walls to provide means for suspending the bag after it is filled.

4. An apparatus for using successively-arranged strips of adhesive-backed material mounted on carrying bands to open, fill, and close a bag, the apparatus comprising a means for supporting the opening end of a bag below a filling apparatus, means for separately conveying two carrying bands to a location near the opening end of a bag, two spaced-apart dispensing edges supporting the carrying bands for separating a portion of each adhesive strip from its carrying band, means for pressing the separated portions of the strips against each other above the opening of the bag to form a seal.
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includes a pivotally mounted flap capable of rotating so as to create a discharge opening for the bag after it is filled.

8. The apparatus according to claim 5, wherein the means for supporting the bag below the filling opening includes a pivotally mounted flap capable of rotating so as to create a discharge opening for the bag after it is filled.

9. The apparatus according to claim 6, wherein the means for supporting the bag below the filling opening includes a pivotally mounted flap capable of rotating so as to create a discharge opening for the bag after it is filled.

References Cited

UNITED STATES PATENTS

2,597,634 5/1952 Grevich ------------- 53—131
2,671,587 3/1954 Vogt ------------- 53—137

THERON E. CONDON, Primary Examiner
E. F. DESMOND, Assistant Examiner

U.S. Cl. X.R.

53—29, 137, 384