May 22, 1962 H. SCHWINGER 3,035,938

METHOD AND MEANS FOR APPLYING CEMENT TO THE CLOSURE PARTS OF FILLED BAGS

Filed Dec. 23, 1959 3 Sheets-Sheet 1

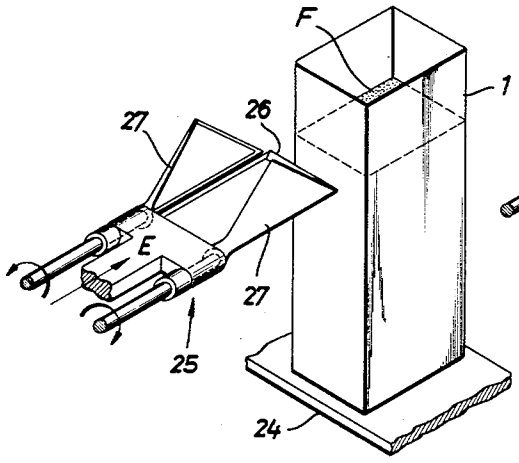


Fig. 1

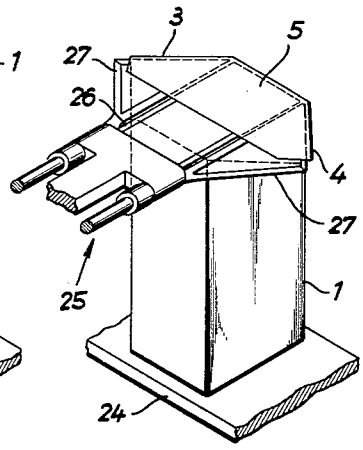


Fig. 2

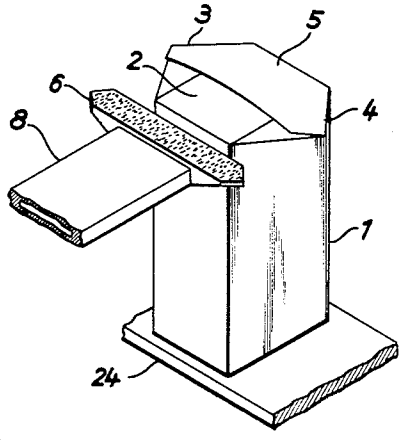


Fig. 3

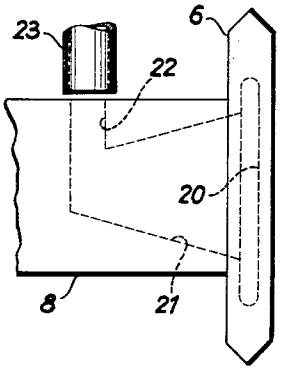


Fig. 6

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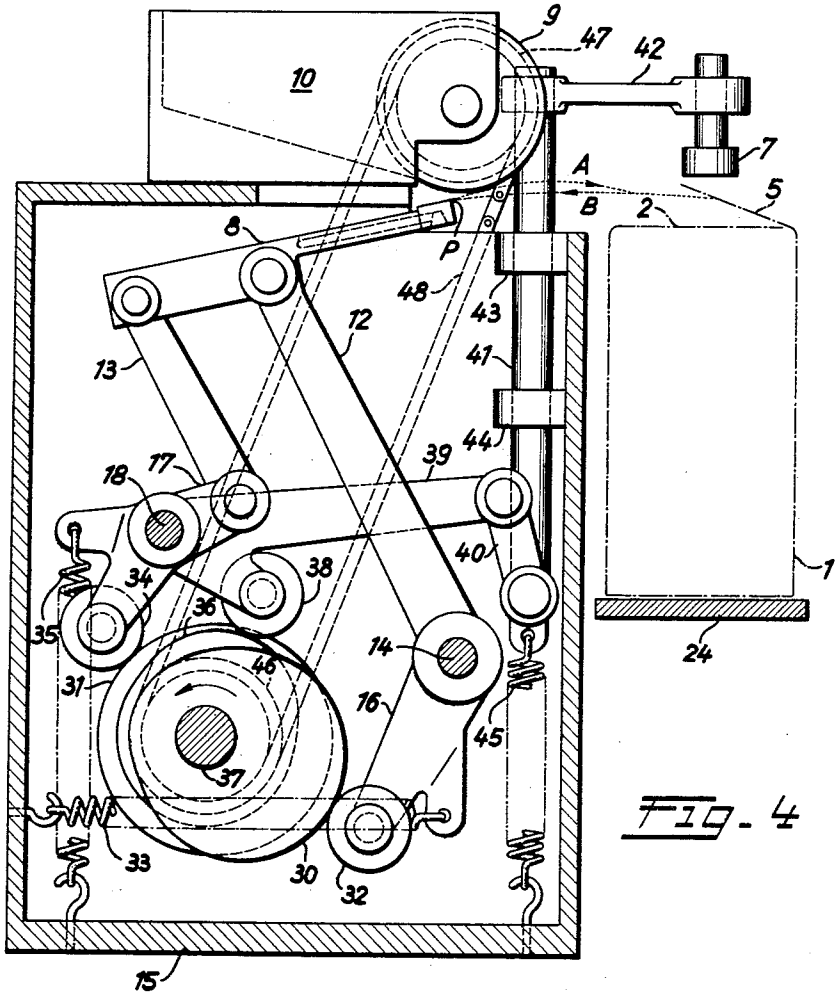


Fig. 4

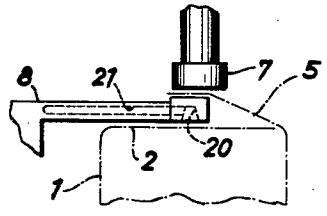


Fig. 5

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3 Sheets-Sheet 3

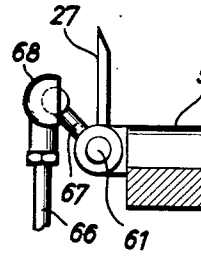


Fig. 8

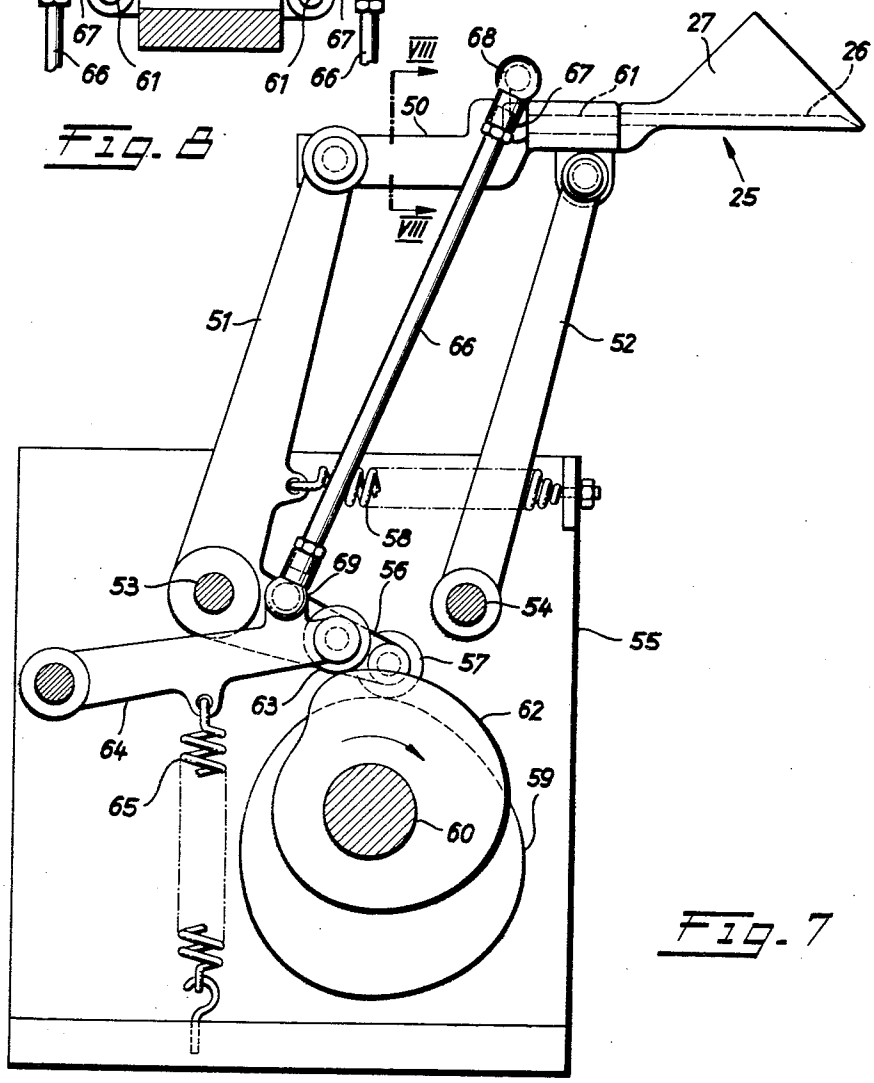


Fig. 7

United States Patent Office 3,035,938
Patented May 22, 1962

3,035,938

METHOD AND MEANS FOR APPLYING CEMENT TO THE CLOSURE PARTS OF FILLED BAGS

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Filed Dec. 23, 1959, Ser. No. 861,569
Claims priority, application Switzerland Dec. 27, 1958
6 Claims. (Cl. 117—44)

My invention relates to a method for applying adhesive to the closure parts of filled bags of paper or similar material, closed in a corner-folding fashion, and to an apparatus for performing this method.

In a known method of the present character, after the parts of the bag projecting above the charged contents of the bag have been pre-folded to form a horizontally-disposed pocket with lateral corners, the upper wall of the pocket is completely erected into a form of collar, and the inner margin of the collar is cemented by means of a movable, horizontally-applied, circular gumming disc to which adhesive has previously been imparted from a gumming roller. The mouth of the bag, prepared in this way, is then closed by folding down the collar and folding in the corners.

This method has the defect that additional tools, and a corresponding expenditure of time, are required for the complete erection of the upper wall of the pocket to form a collar and for the re-folding down of the collar on to the pocket. In addition there is the danger, during the folding down of the collar, that parts of the contents of the filled bag will be scattered on to the area which is subsequently to be cemented, with the result that the closure is then improperly sealed.

The aim of my invention is to remove the aforesaid disadvantages by means of a method which can be simply and rapidly carried out and ensures an effective, properly-sealed closure of the bag.

To this end, the method according to the present invention resides in the fact that the parts of the mouth of the bag projecting above the filling of the latter are pre-folded by suitable folding members to form a corner-provided pocket, and that there is inserted into the pocket, which re-opens somewhat after the withdrawal of the folding members on account of the resilience of the material of the bag, a cementing bar which is provided with cement and upon which the upper margin of the pocket is pressed and cement thereby transferred from the cementing bar to the margin of the pocket. The finishing of the closure is then performed in the usual way by pressing on the margin of the pocket and subsequently folding in the corners.

In apparatus devised for carrying out this method, the cementing bar is secured to an arm which is pivotally connected to a rockable bellcrank lever and pivotally to a second lever which is likewise rockable, these two levers being so controlled during the movement of the bar that the latter, during its working movement, tangentially contacts a cementing roller which carries adhesive on the surface thereof, and passes the cementing roller at a predetermined distance therefrom during its return movement to its starting position.

To avoid detrimental effects from such dust as may be deposited at the gumming zone during the initial folding of the corner-provided pocket, in accordance with a further feature of the invention the cementing bar has a suction orifice which can be brought into communication with a suction air assembly in such a way that any particles of dust located on the lower closure parts of the bag are drawn off by suction.

In the drawings:

FIGURE 1 is a side view of a part of an embodiment

of the apparatus for carrying out the method according to the invention,

FIGURE 2 is a plan view of the part shown in FIG. 1 in operative position,

FIGURE 3 shows the pre-folded bag top and an adhesive-carrying bar moved thereonto,

FIGURE 4 is a cross-sectional view of the driving mechanism for the adhesive-carrying bar,

FIGURE 5 shows the adhesive-carrying bar in a more advanced operating position than that shown in FIG. 4,

FIGURE 6 is a plan view of the adhesive-carrying bar,

FIGURE 7 is a side view of the drive means for the folding device,

FIGURE 8 is a sectional view taken on line VIII—VIII of FIG. 7.

To apply adhesive to the closure parts of the bag, these latter are prefolded by means of a folding member **25**, as illustrated in FIGS. 1 and 2. The procedure is that a front flap **2** is folded in upon the contents of the bag **1**, and thereafter the two laterally-adjoining folding corners **3** and **4** are turned over outwards in the horizontal plane. In this procedure, the flap **5** opposite the flap **2** is folded down upon the flap **2** and partially covers the latter, so producing a corner-provided pocket.

The folding member **25** is moved, at the height of the contents F if the bag **1**, from one of the narrow sides of the later in the direction of arrow E (FIG. 1) towards the bag standing on a rail **24** or the like, whereby the folding slide **26** of the folding member **25** folds the flap **2** down onto the contents of the bag **1**. Following this, the triangular folding wings **27** which are pivotally mounted and arranged laterally of the folding slide **26** and are at first in a vertical position as shown in FIG. 1, are swung outwardly into a horizontal position (FIG. 2), whereby the above described corner-provided pocket is formed.

As shown in FIGS. 7 and 8, the folding member **25** is secured to a bar **50** which is carried by a bell-crank lever **51** and a lever **52**. The bell-crank lever **51** and the lever **52** are both rockably mounted on pivots **53**, **54** of a supporting frame **55**. The arm **56** of the bell-crank lever carries a roller **57** which is urged against the periphery of a cam disc **59** by the force of a tension spring **58**. The cam disc **59** which is fixed mounted on a drive shaft **60**, during its rotation controls the advance and return movements of the folding member **25**.

The pivotal movement of the folding wings **27** which are supported in bores of the bar **50** by means of pivots **61**, is controlled by a further cam disc **62** which is also fixedly mounted on shaft **60**. A roller **63** provided on the extremity of a lever arm **64** is urged against the periphery of cam disc **62** by the force of a tension spring **65**, and the rocking movement of lever arm **64** is transmitted by means of rods **66** to crank arms **67** which are fixedly mounted on the rear end of the pivots **61** of the folding wings **27**. The rods **66** are articulated to the crank arms **67** and to the lever arm **64** by means of ball joints **68**, **69**.

After withdrawal of the folding member **25**, the said pocket opens somewhat as a consequence of the resilience of the material of the bag.

To obtain a sealed closure, adhesive may be applied to one of the two flaps **2** or **5** in the region of the registering parts of the margins of the corner-provided pocket. In the present instance, adhesive is applied to flap **5**. This is performed by introducing a bar **6**, which is coated at its upper side with adhesive, into the pocket defined by the flaps **2**, **5**, and pressing down the upper flap **5** by means of a descending plunger **7** (FIGURE 5) on to the bar **6**. Adhesive is thus transferred to the flap **5** so that, after the bar **6** is withdrawn, the two flaps **2**, **5** are caused to adhere together by subsequent pressing down of the upper flap **5** against the flap **2**.

The transfer of adhesive to the bar 6 is carried out by conducting the bar, which is secured to an arm 8, tangentially at each operating step of the machine, against a cementing roller 9 which rotates in an adhesive containing reservoir 10, cf. FIG. 4. A thin layer of adhesive is, thereby applied to the surface of the bar 6. This movement of the bar 6 is indicated, as regards the point P thereof, by the direction of the arrow A in FIGURE 4. After transfer of the adhesive to the flap 5, the bar 6 is moved back to its starting position in the direction of arrow B, without contacting the cementing roller 9, so that no cement can collect at the rear edge of the bar 6.

To enable the bar 6 to perform the motion described, the arm 8 is mounted on a bellcrank lever 12 and on a lever 13, and the advance and return movement of the bar 6 is brought about through the lever 12, and the required heightwise position of the bar 6 is secured by the lever 13 through cam discs 30, 31. The bellcrank lever 12 is pivotally mounted on a pin 14 in the housing 15 and is operatively connected through the cranked arm 16 and roller 32, by means of a spiral spring 33, with cam disc 30. The lever 13 is pivotally connected to a lever 17 which is pivotably mounted in the housing 15 on a pin 18 and operatively connected with its roller 34, by means of a spiral spring 35, with the cam disc 31.

The depressing movement of plunger 7 is controlled by a cam disc 36 which, like the aforementioned cam discs 30 and 31, is mounted on a drive shaft 37. A roller 38 rotatably mounted on a lever 39 is in operative contact with the periphery of cam disc 36. The lever 39 is pivotably mounted on the pivot 18, and through the intermediary of a link 40 is connected with a rod 41. This rod 41 is guided in bearings 43, 44 and carries of its upper end an arm 42 on which the plunger 7 is mounted. The roller 38 is urged against the cam disc 36 by a tension spring 45 which is anchored to the lower extremity of rod 41.

The cementing roller 9 is driven from the drive shaft 37 through chain gearing comprising sprockets 46, 47 and a chain 48.

To remove dust, the bar 6 is provided at its lower side with a suction slot 20. This slot is connected to a duct 21 in the arm 8 and opens laterally of the arm as a slot 22. When the bar 6 is inserted into the pocket of the bag 1 defined by the flaps 2 and 5, the slot 22 passes in front of the orifice of suitable suction duct indicated at 23 in FIG. 6, so that any particles of dust which may be present on the flap 2 are carried off by the suction flow through the duct 21 and the slot 20. As will be understood, the suction duct 23 may be arranged permanently on the arm 8 through a flexible tube.

What I claim is:

1. A method of applying cement to an open mouth container having an inner and outer surface comprising folding the bag blank at the open mouth to form two partially overlapping polygonal flaps defining a pocket which is disposed in a plane parallel to that of the open mouth and whereat the inner surface of one of the flaps is adjacent the outer surface of the other of the flaps, inserting a cementing bar adapted for having a supply of cement thereon between said flaps and urging the outer flap and the cementing bar together to transfer cement to the inner surface of the outer flap.

2. A method of applying cement to the closure parts of filled bags comprising folding an open mouth of a bag blank to form a pocket in a plane parallel to that of the open mouth and provided with lateral corners, then inserting a cementing bar adapted for supporting a supply of cement thereon into said pocket, and pressing the upper margin of the pocket against said bar, to transfer cement from the bar to the margin of the pocket.

3. A method of applying cement to an open mouth container including four sides and an edge in which the sides are vertically disposed comprising folding inwardly one of the sides, simultaneously folding outwardly the sides adjacent said one side, and folding inwardly the remaining side to form a cross fold closure defining a transverse pocket which is longitudinally disposed; inserting a cementing bar having a supply of cement supported thereon under the influence of gravity into said pocket and urging said remaining side and the cementing member together to transfer cement to the remaining side.

4. Apparatus for applying cement to a filled bag blank, comprising a pair of parallel rockable bellcrank levers, a cementing bar pivotally connected to said levers, means operatively associated with said levers to define a closed path of movement for said cementing bar, a cementing roller having a supply of cement thereon, said cementing bar contacting the roller only once for each traversal of said closed path, the cementing bar contacting said bag blank subsequent to the contact with said roller and in a substantially horizontal plane.

5. Apparatus for applying cement to a filled bag blank, comprising a cementing bar adapted for lateral movement in two directions, a cementing roller adapted for having cement thereon, means attached to said cementing bar for urging the same against the roller in one of the directions of movement and away from the roller in the other direction of movement, said cementing bar being engageable with the filled bag blank in said one direction of movement, said cementing bar being provided with a suction orifice; and suction means adapted for engagement with the suction orifice for applying a suction force to the bag blank.

6. Apparatus as claimed in claim 5, wherein said cementing bar is provided with an opening of slot shape and a duct in communication with said opening, said slot and duct providing a suction passageway engageable with the suction means with said cementing bar in contact with the bag blank.

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