

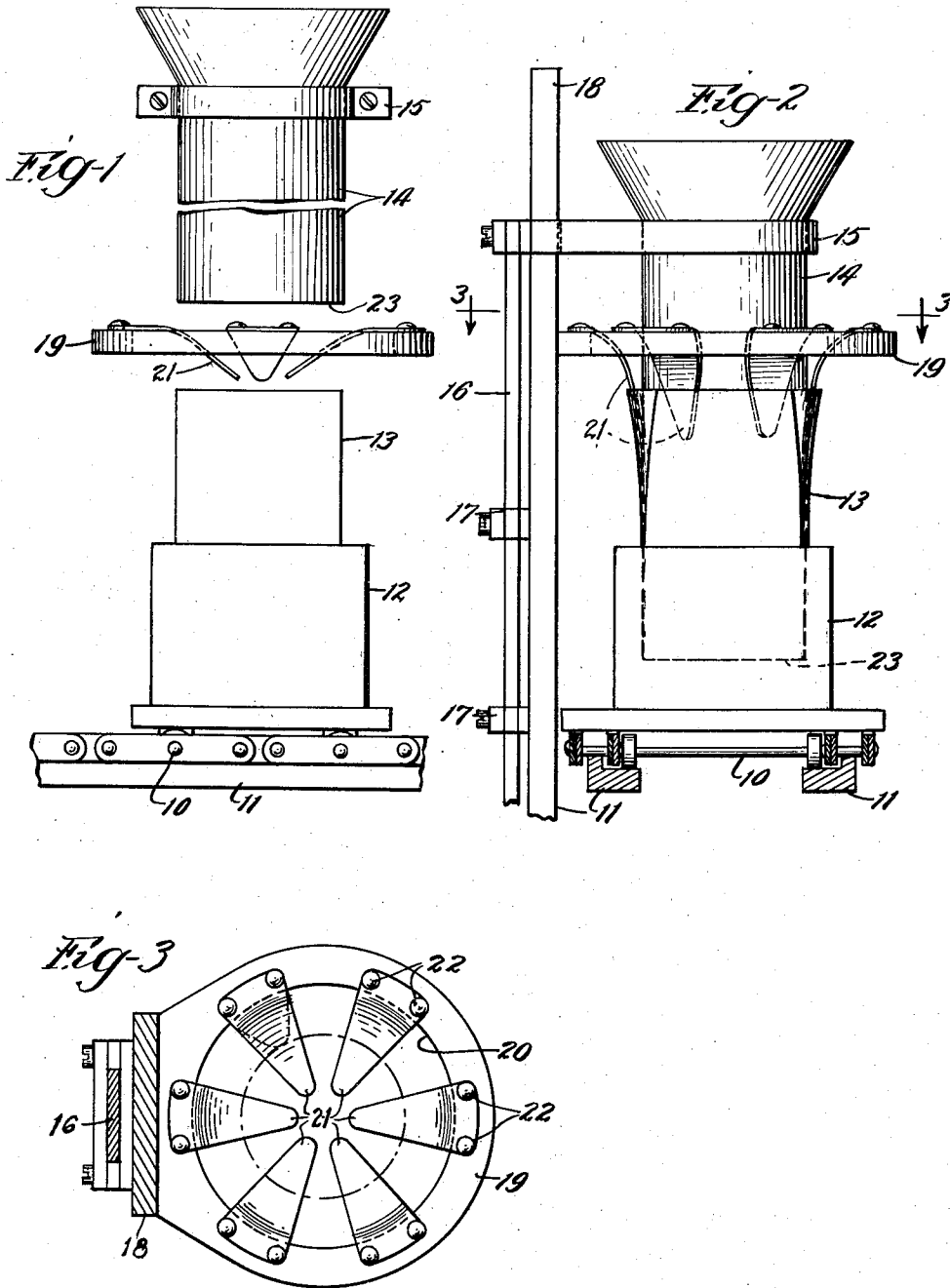
Aug. 14, 1956

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2,758,764

CONTAINER OPENING AND FILLING MECHANISM

Filed March 8, 1951



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2,758,764

CONTAINER OPENING AND FILLING MECHANISM

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Application March 8, 1951, Serial No. 214,535

3 Claims. (Cl. 226—59)

This invention relates to packaging machines for filling flexible bags or containers with merchandise and is more particularly concerned with a bag top opening or spreading mechanism.

It is a general object of the invention to provide a mechanism for spreading the top of a flexible container to fully open position and holding the same in such position while the container is filled with a quantity of the commodity being packaged.

It is another object of the invention to provide in a bag filling machine a reciprocable filling spout and mechanism cooperating with the filling spout for expanding the top of a bag positioned beneath the filling spout into fully open position upon movement of the filling spout therein.

It is a more specific object of the invention to provide in a bag filling machine having means for supporting a bag in open position and a reciprocable filling spout mounted for insertion within the open top of the bag, a plurality of bag top spreading members mounted in the path of movement of the filling spout which are automatically moved into top spreading position within the bag upon movement of the filling spout therein.

It is another object of the invention to provide in a bag filling machine having a pocketed conveyor for supporting therein a series of bags, a filling mechanism comprising a reciprocable filling spout arranged at a work station along the conveyor and mechanism, operated by movement of the spout to filling position, to open up or spread the top of the bag and hold it in opened position during the filling operation.

It is a further object of the invention to provide in a bag filling mechanism a reciprocating filling spout, means for supporting an open bag beneath the spout so that the end of the spout moves a substantial distance into the bag just prior to the filling operation, and a cooperating means arranged to move into the open bag top as the spout moves therein to spread the bag top and hold it in fully open position while the bag is filled with merchandise through the spout and the spout moves out of the bag.

It is another object of the invention to provide in a bag filling machine having a filling station and an intermittently operated conveyor having means thereon for supporting a series of bags and for successively positioning the same at the filling station, a reciprocable filling spout at the station, a fixed support having a central aperture therein and a plurality of resilient bag top expanding fingers connected to the support and extending within the central aperture thereof, the filling spout and the aperture in the fixed support being aligned with the open top of the bag as it is positioned by the conveyor at the filling station, so that upon movement of the filling spout through the aperture and into the top of the bag the inwardly extending fingers are pivoted downwardly and outwardly of their support into top expanding position within the bag.

These and other objects of the invention will be apparent from a consideration of the mechanism which is shown by way of illustration in the accompanying drawings, wherein:

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Fig. 1 is a side elevation of a bag top spreading mechanism embodying therein the principal features of the invention, with portions of a supporting structure and a bag delivery conveyor being shown therewith;

Fig. 2 is an end elevation of the bag top spreading mechanism, with the cooperating supporting structure and bag delivery conveyor being shown in section; and

Fig. 3 is a section, to an enlarged scale, taken generally on the line 3—3 of Fig. 2.

The mechanism in the accompanying drawings which embodies therein the principal features of the invention is shown, for convenience in illustrating the same, incorporated in a packaging machine of the type described in my copending application for Container Filling, Closing and Sealing Machine, Serial No. 81,154, filed March 12, 1949. Only those elements of the packaging machine are shown which are necessary for an understanding of the operation of the mechanism of the present invention. The present mechanism may of course be incorporated in or used in conjunction with any other packaging machine of a similar character where empty containers which are of relatively flexible material and which are in opened out or set-up condition, are presented to a filling device for inserting therein a quantity of merchandise.

In the packaging machine with which the device is shown in the drawings empty bags which are fabricated of relatively flexible material such as paper, Cellophane, etc. are received in open condition in the pockets of a conveyor which is intermittently moved to carry the bags past a series of work stations which include a filling station, a bag top folding station and a bag top sealing station. These mechanisms operate successively on the bags to fill each bag with merchandise, to fold into closed position the top thereof and finally to seal the folded top by application of heat and pressure.

Referring to the drawings, there is shown the filling station of a packaging machine at which the mechanism of the present device is located. A conveyor 10 is supported on a frame member 11 and provided with pockets or holders 12 which are mounted thereon so that they are in upright position extending above the top run of the conveyor 10. The conveyor 10 is arranged to move each successive bag holder 12 beneath a material hopper or feed mechanism (not shown) which feed mechanism is adapted to provide a predetermined charge of the material which is to be packaged for delivery to each bag 13 in timed relation to the movement of the conveyor 10. Suitable mechanism (not shown) is provided for controlling the operation of the conveyor 10 to position the successive bag holders 12 intermittently at the filling station for a sufficient length of time to receive a charge of material within each bag 13.

A delivery funnel or feed chute structure 14 is supported at the filling station on a horizontally extending bracket 15 which is secured to the top of a vertical reciprocating arm or rod 16. The rod 16 is supported in guide brackets 17 on an upstanding supporting post member 18 and reciprocated by a properly timed cam (not shown) or other operating mechanism.

The funnel or spout 14 is positioned at the filling station so that in retracted or elevated position it is above the top of the open bag 13 and in alignment with the same when a bag holder 12 is moved by the conveyor 10 into position for filling the bag 13 therein.

A horizontal plate 19 is arranged to extend into the path of movement of the filling spout 14 between the spout 14 in elevated position and the support for the bag 13 beneath the same. The bracket plate 19 is secured to the supporting post 18 which post extends vertically from and forms part of the machine support frame 11. The plate 19 is apertured at 20, the size of the aperture 20 being greater than the size of the open top of the bag 13

and being also of sufficient size to accommodate the portion of the spout 14 which moves into the same as the spout descends for the filling operation. It is arranged in alignment with the spout 14 and the top of the bag 13 so that upon vertical movement of the spout 14 in a downward direction a substantial portion of spout 14 will pass through the aperture 20. A plurality of inwardly extending relatively flexible plate-like bag top opening or spreading fingers 21 are secured at their outer ends at 22 to the support plate 19 and extend radially inwardly of the aperture 20. The fingers 21 are preferably formed of resilient material so that upon movement of the spout 14 through the aperture 20 the bottom edge 23 of the spout 14 will engage the upper surfaces of the fingers 21 and bend or pivot the same downwardly into the open top of the bag 13. As the spout 14 moves into the open top of the bag 13 the fingers 21 spread out radially and hold the margins of the bag 13 in a generally circular fully opened position insuring the entry of the bottom portion of the spout 14 into the bag 13 in proper position for the filling operation. The product or merchandise which is delivered by the weighing or other charge measuring mechanism (not shown) passes through the spout 14 and into the bag 13 while the spout 14 and the fingers 21 are in the position shown in Fig. 2. The spout 14 is withdrawn by upward movement of the rod 16 leaving the charge of merchandise in the bag 13, and the fingers 21, due to their inherent resiliency or their resilient mounting, move back into generally horizontal position, leaving the bag free for movement by the conveyor to the next station for further operations thereon.

The filling spout 14 is preferably formed with sufficient length to extend a substantial distance within the bag, especially when the material being packaged is in powdered form. With the bottom edge 23 of the spout 14 moved close to the bottom of the bag 13 the charge of merchandise may be deposited therein with a minimum of dust arising from the falling charge and with the mouth portions protected from any dust which does arise so that loss of material is minimized and also there is little or no tendency for dust to settle on the marginal walls of the bag mouth where it would interfere with the formation of a satisfactory heat seal.

While the fingers 21 are preferably formed of relatively thin, flat resilient spring plate material, they may be formed of suitable wire or of more rigid material and also they may be hingedly mounted in such a manner that they will be moved into the bag top upon descent of the spout 14 and out of the bag top upon withdrawal of the spout 14 through the aperture 20 of the supporting plate 19.

While the device of the present application has been illustrated in connection with a specific filling and closing machine, it will be understood that it may be incorporated in other structures of a similar character. Also it may be used as an independent filling arrangement in which the bag is positioned manually, or by a suitable conveyor or carrier, beneath the reciprocable spout for the filling operation and removed therefrom after it has received the desired contents.

The specific details of construction shown are illustrative only and other details of construction within the spirit of the invention are contemplated.

I claim:

1. In a bag filling machine, a filling station, a conveyor having pockets for supporting a plurality of open bags therein, said conveyor being mounted for intermittent movement to position the bags successively at the filling station, a vertically reciprocable filling spout mounted at said station with the lower end thereof positioned, when said spout is retracted, immediately above the top of a bag

carried in a pocket of said conveyor, a fixed support member extending horizontally into the path of movement of said filling spout, said fixed support member being positioned adjacent the top of a bag supported in a conveyor pocket at said filling station and having an aperture therein for accommodating the filling spout, and generally V-shaped bag top expanding fingers of resilient material fixedly mounted at the wider end thereof on said support member in spaced relation around the periphery of the aperture therein with the narrower ends extending in a generally horizontal direction into said aperture, said fingers having their free ends movable downwardly into a generally vertical position within a bag top positioned in a pocket of the conveyor when said pocket is positioned at said filling station to spread the mouth thereof upon movement of the lower end of the filling spout into engagement with said fingers and through said aperture in said fixed support member.

2. In a bag filling machine, a filling station, a filling spout mounted for reciprocable vertical movement at the filling station, an intermittently operated conveyor having pockets for supporting bags successively in upright position beneath said filling spout, a support member extending horizontally in a plane beneath the lower end of said filling spout when said spout is in retracted position and having an aperture therein for accommodating the lower end of the filling spout when said spout moves downwardly, and a plurality of bag top spreading members of relatively thin flat resilient plate material rigidly secured at one end on said support member, said bag top spreading members extending in peripherally spaced generally horizontal position into the aperture in said support member whereby said conveyor may be operated to move bags positioned in the pockets thereof in a lateral direction to a filling position beneath said support with the top edges of the successive bags moving into proximity to the lower face of said support, said fingers being adapted to have the free ends thereof bowed downwardly into a generally vertical position within the bag top to spread the mouth thereof upon movement of the lower end of the filling spout through said aperture.

3. In a bag filling machine, a filling station, a filling spout mounted for reciprocable vertical movement at the filling station, means for supporting successive bags in upright position with the top edges at the mouth of the bags adapted to remain in fixed position relative to the vertical path of movement of said filling spout during the filling operation, a fixed support extending across the path of movement of said filling spout with the lower face thereof adjacent the top edges of the bags, said support having an aperture through which the filling spout passes as it descends into the mouth of a bag and bag top spreading members arranged in generally radial and horizontal extending relation in said aperture, said top spreading members being of resilient material and having their inner free end portions projecting into the path of said filling spout in non-engaging spaced relation whereby said top spreading members are moved into the bag by engagement therewith of the lower edge of said spout as it descends into the bag.

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