June 18, 1957 C. B. HARKER 2,795,906

METHOD OF AND APPARATUS FOR INSERTING FLEXIBLE STRIPS INTO BAGS

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Fig. 1

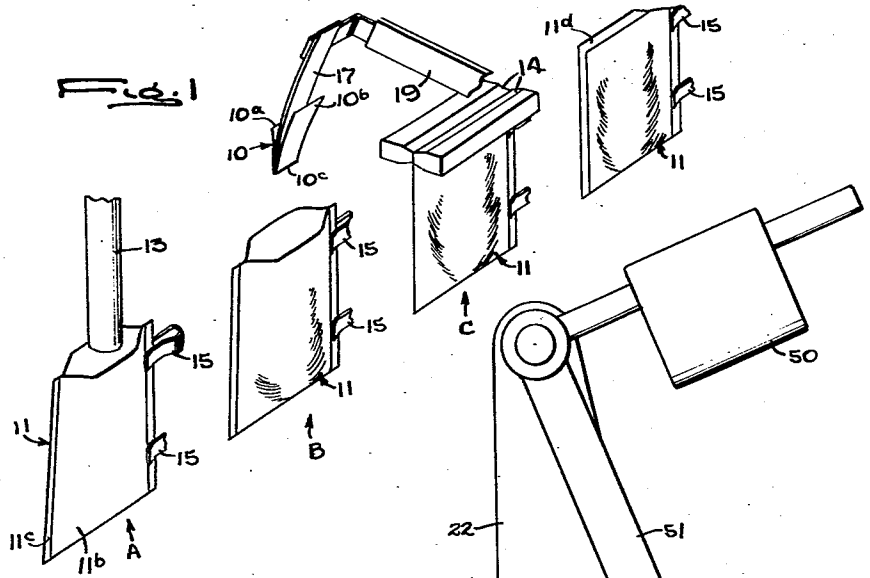
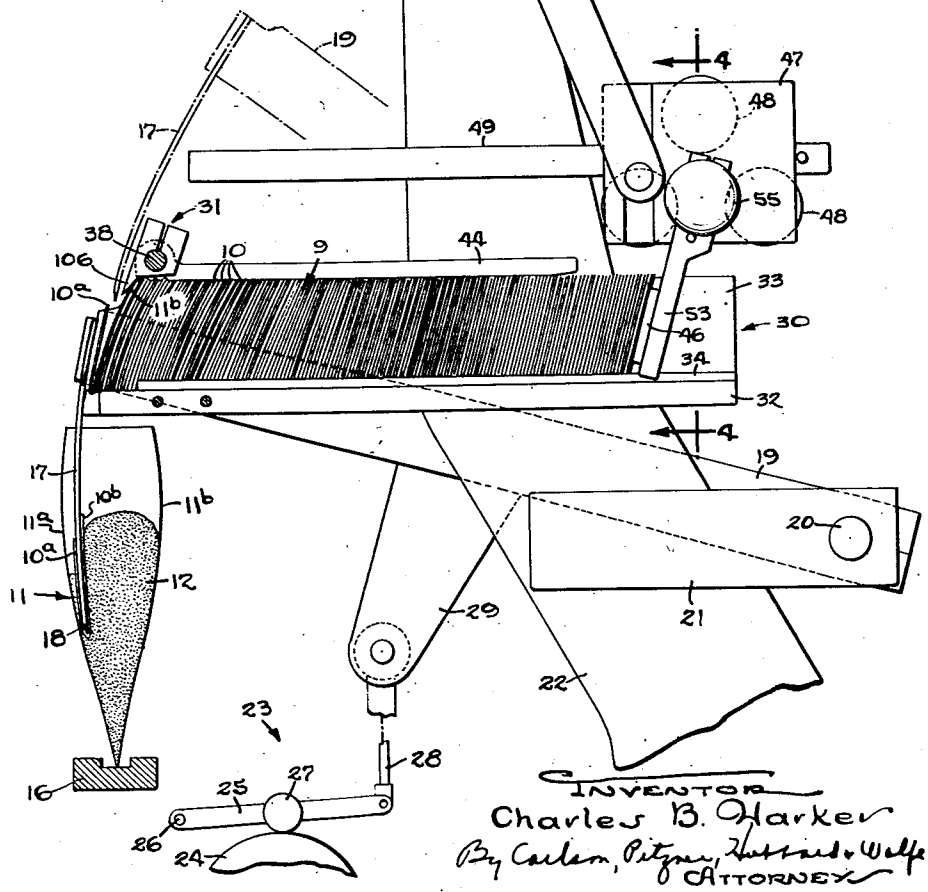


Fig. 2



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Fig. 3

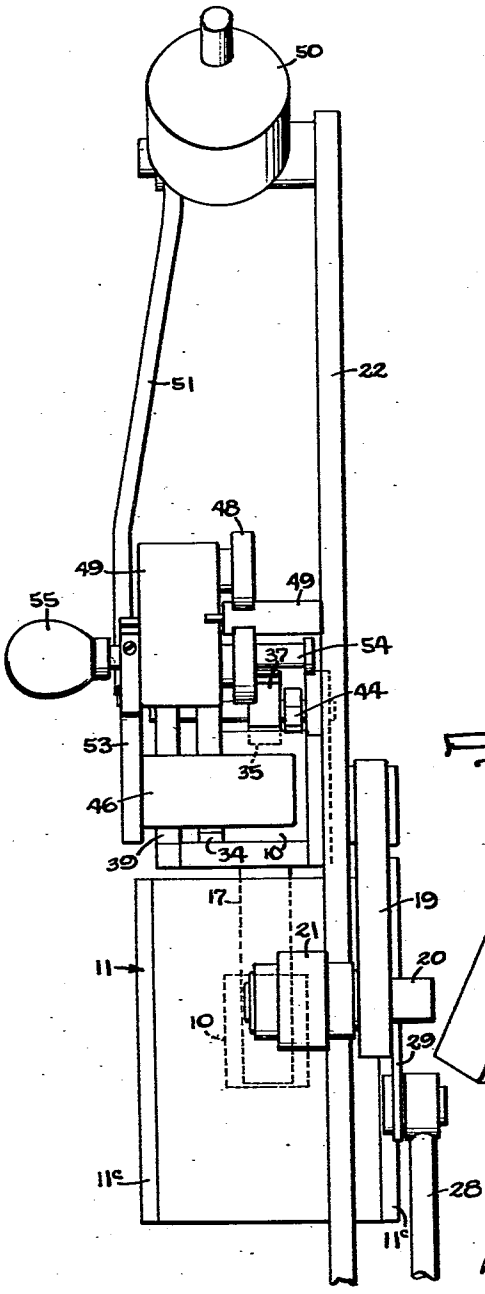


Fig. 4

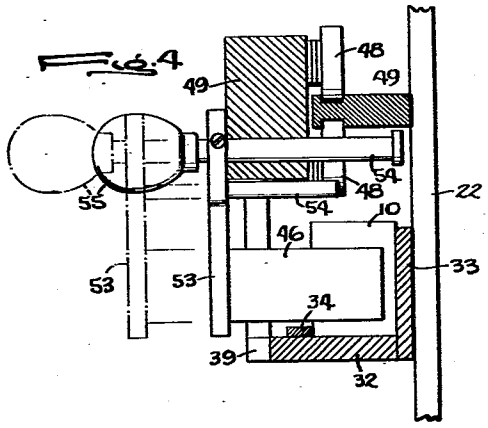


Fig. 5

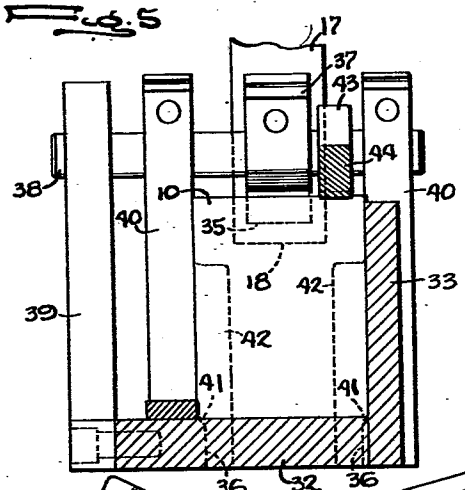
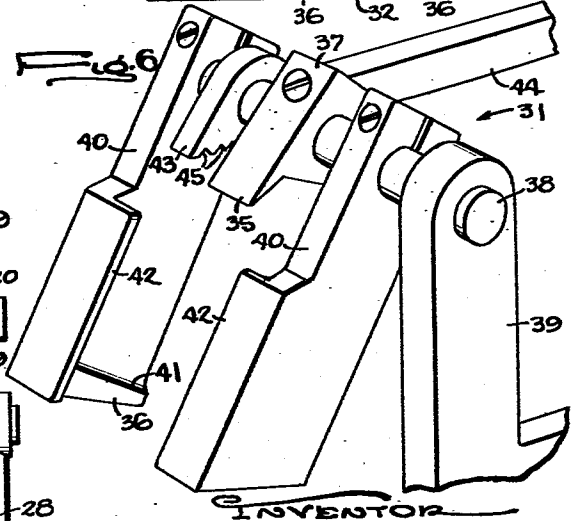


Fig. 6



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METHOD OF AND APPARATUS FOR INSERTING FLEXIBLE STRIPS INTO BAGS

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Application October 1, 1953, Serial No. 383,440

4 Claims. (Cl. 53—26)

This invention relates to the insertion of flexible strips such as coupons into bags and the primary object is to provide a novel method and apparatus by which flexible strips may be picked up one at a time and deposited in successive bags in the reciprocation of a carrier member into and out of each bag.

Another object is to deposit each coupon in its bag with a minimum disturbance of the material partially filling the bag.

A more detailed object is to employ a V-shaped folded coupon and project the same folded end first into the bag and along one side wall of the bag.

A further object is to support the folded coupons in a novel manner to facilitate picking up of the successive coupons in the bag entering movements of the carrier member.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a fragmentary perspective view illustrating the improved method of inserting a flexible strip into a bag.

Fig. 2 is a fragmentary side elevational view of the strip inserting mechanism with some parts broken away.

Fig. 3 is a rear elevational view of the strip inserting mechanism.

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary elevational view of the strip positioning apparatus.

Fig. 6 is a fragmentary perspective view of the strip positioning apparatus.

As illustrated in the drawings, the present invention is particularly useful for inserting a flexible strip **10** such as a coupon into a flexible walled open topped bag **11** after the latter has been partially filled with a measured quantity of granular or powdered material **12**.

The coupon shown is an elongated strip of paper folded into a V-shape and having legs **10a** and **10b** projecting different distances from a fold **10c**. The bag **11** comprises two side walls **11a** and **11b** of suitable thermoplastic material joined together along a bottom fold and at their side edges by heat seals **11c**. As shown in Fig. 2, the bag contents **12** being granular or powdered, completely fill the space between the bag walls **11a** and **11b** in the lower and intermediate portions of the bag.

Insertion of a coupon **10** into a bag **11** preferably is effected during the dwell of the bag at a station B after the measured amount of the material **12** to be packaged has been deposited in the bag by a filling mechanism including a spout **13** at a station A. From the filling station A, the bag is advanced step by step along a path extending through the coupon inserting station B and to a closing station C where the side walls **11a** and **11b** of the bag adjacent the open end are pressed between heated shoes **14** to form a top seal **11d** and close the bag.

To advance a series of bags successively through the filling, inserting, and closing stations, A, B and C, the leading side seals of the bags are engaged by pairs of grippers **15** spaced along and carried by a conveyor (not shown) which is advanced intermittently along a path extending through the stations A, B and C, the bag bottoms resting in a channel-shaped track **16** (see Fig. 2). The conveyor, the grippers **15**, the filling mechanism, and the heat sealing shoes **14** are constructed and actuated in timed relation in the manner shown and described in Patent 2,649,674 to which reference may be made for further details.

Generally, the improved method comprises supporting a bag **11** with its open end up at the inserting station B, placing the flattened folded coupon **10** on a carrier member or blade **17** with an edge **18** of the latter seated in the fold **10c** of the coupon as shown in Fig. 1, projecting the blade edgewise through the bag opening and downwardly into the bag, and withdrawing the blade from between the bag walls **11a** and **11b** to leave the coupon deposited within the bag. The blade **17** is reciprocated in timed relation to the presentation of bags to the inserting station B and moves back and forth along a predetermined path from a retracted position above the bag as shown in phantom in Fig. 2 to an advanced position between the bag walls as shown in full in Fig. 2 and during such advance picks up the leading coupon **10** from a stack **9** and carries the same downwardly into the bag where the coupon remains as the blade is retracted. To minimize disturbance of the material **12** when a coupon **10** is inserted into a partially filled bag, the blade path extends along one side wall **11a** of the bag so that, in its movement to the advanced position which is below the level of the material, the blade separates the latter and the bag wall, the coupon remaining wedged between the two upon withdrawal of the blade.

In the present instance, the blade **17** is a flat slightly curved rectangular member terminating at its lower end in a horizontally disposed edge **18** and projecting downwardly from the end of a generally horizontal arm **19** to which the upper end of the blade is secured. Preferably, though not necessarily, the reciprocation of the blade is achieved by mounting the arm **19** to swing about a pivot **20** on a projection **21** rigid with a stationary post **22** forming a part of the frame of the machine. The pivot is positioned to locate the arm in a vertical plane extending transversely through the coupon inserting station B and to define the predetermined path above referred to through which the blade edge **18** is reciprocated.

Swinging of the blade **17** in timed relation to the advance of the bags **11** and during the dwell of a bag at the inserting station B is effected by oscillating the arm **19** through a suitable linkage **23** (Fig. 2) connecting the arm and a cam **24** on a camshaft of the machine. Herein, this linkage comprises a straight lever **25** having a fixed pivot **26** at one end and carrying intermediate its ends a follower roller **27** engageable with the periphery of the cam **24**. At its other end, the lever **25** is pivotally connected through a link **28** to a boss **29** projecting downwardly from an intermediate portion of the arm **19**. The cam **24** is shaped so that, once during each revolution of its shaft, the blade **17** is dropped from its normally retracted position to its advanced position and then swung upwardly and back into the retracted position.

To enable one coupon **10** to be picked off from the stack **9** in each downward stroke of the blade, the coupons of the stack **9** are arranged face to face in a horizontal row with the leading coupon of the row always disposed between the open end of the bag **11** and the retracted position of the blade edge **18**, the fold of the leading cou-

pon pointing downwardly and having its legs 10a and 10b disposed on opposite sides of the path of the blade. In the downward movement of the blade from its retracted position, the edge 18 becomes seated in the fold 10c of the terminal coupon and strips the latter from the row. Due to the rapid downward movement of the blade, the stripped coupon adheres to the blade and moves therewith in between the side wall 11a of the bag and the material 12. In the retracting movement of the blade, the latter slips out from its position between the legs of the coupon which remains wedged against the bag wall.

The coupons 10 of the stack 9 are supported in a horizontal chute or storage device 30 mounted on the post 22 and are urged by yieldable means 46 along the chute toward one end thereof which terminates adjacent the path of the blade 17 and between the advance and retracted positions of the latter, the coupons being disposed in the chute in side by side relation with the shorter leg 10a of each coupon disposed on the leading side of the latter facing toward the blade path. The chute is disposed in the vertical plane of swinging of the blade and comprises a horizontal bottom wall 32 on which the folds 10c of the coupons rest, a vertical wall 33 upstanding from the bottom wall 32 and secured to the post 22, and a rib 34 on the bottom wall parallel to and spaced from the vertical wall 33 a distance equal approximately to the width of the coupons.

Mounted on the end of the chute 30 adjacent the path of the blade 17 is a positioning device 31 which engages the terminal or leading coupon 10 of the stack 9 and is constructed to take advantage of the difference in the lengths of the legs 10a and 10b of the leading coupon to insure disposal of the latter in the blade path for pick-up by the blade in its downward movement. Generally, the positioning device comprises two vertically spaced stops 35 and 36 engageable respectively with the free edge portion of the long leg 10b and the fold 10c of the leading coupon to limit advancing movement of the long leg to a position on the chute side of the blade path. The spacing between the stops is greater than the length of the short leg 10a of the leading coupon to permit the latter to pass under the upper stop 35 and bend outwardly and across the blade path to the opposite side thereof. In this instance, the upper stop 35 is a downwardly extending pointed projection formed on a split ring 37 which may be tightened around a stationary horizontal pin 38 disposed above the row of coupons and carried by a bracket 39 upstanding rigidly from the edges of the bottom chute wall 32. This upper stop 35 projects downwardly far enough to engage the free ends of the long coupon legs 10b but short of the paths of the shorter legs 10a whose upper ends may pass freely beneath the stop.

The other or lower stop 36 for engaging the coupon folds 10c comprises two ledges straddling the blade path and projecting inwardly toward each other from the lower edges of two parallel flat arms 40 secured at their upper ends to the pin 38 and spaced apart a distance equal approximately to the widths of the coupons which pass between them. Along their top edges 41, the ledges 36 constitute extensions of the bottom chute wall 32, these edges engaging the bottom fold 10c of the leading coupon as the latter advances from the bottom chute wlal 32. To enable the top edges 41 of the ledges to restrain outward movement of the fold 10c of the leading coupon while permitting the fold to advance toward and into the blade path, these edges are inclined upwardly as shown in Fig. 6. It has been found that due to the action of the stops 35 and 36 and the pressure of the stack behind the leading coupon, the long leg 10b of the latter bows outwardly resulting in bending of the shorter leg across and to the opposite side of the blade path.

Outward swinging movement of the short leg 10a of the terminal coupon preferably is limited by flanges 42 projecting inwardly toward each other from the outer edges of the stop arms 40. To permit its passage between the ledges 36 and inside of the flanges 42, the blade 17 is narrower than the lateral spacing of the ledges.

Additional restraint against outward movement preferably is applied to the free edge portions of the long coupon legs 10b by another stop member 43 pivoted on the pin 38 and having an arm 44 lying along the tops of the coupons in the chute 30. Adjacent the pivot, this stop member projects downwardly to terminate in an inclined serrated edge portion 45 engageable with the long coupon legs 10b.

The yieldable means 46 urging the coupons 10 of the stack 9 along the chute 30 toward the blade path, in this instance, is a plate 46 engageable with the coupon at the rear end of the stack 9 and mounted on a carriage 47 which carries rollers 48 to engage a horizontal track 49 secured to the post 22 and disposed above the chute for movement of the carriage above the row of coupons. The yieldable force for urging the carriage and plate 46 toward the blade path is a weight 50 which is adjustable along one leg of a bell crank 51 fulcrumed on the post and having the free end of its other leg pivotally and slidably connected to the car as indicated at 52. To enable the plate 46 to be retracted from behind the row of coupons to facilitate the deposit of new coupons in the chute, the plate is a part of a slide 53 movable relative to the carriage on pins 54 and laterally of the coupon row between the position shown in full and in phantom in Fig. 4. A suitable handle 55 may be attached to the slide to effect such movement.

In the operation of the novel apparatus described above, let it be assumed that a bag is dwelling at the inserting station B and the blade 17 is in its retracted position as shown in phantom in Fig. 2, with the short leg 10a of the leading coupon 10 in the chute 30 projecting across the blade path. As the cam 24 turns, the blade 17 moves downwardly to its advanced position shown in full in Fig. 2. During this descending movement, the blade passes first between the legs 10a and 10b of the terminal coupon to seat the blade edge 18 in the fold 10c thereof, next enters the open bag end, and then slides along the inner side of the bag side wall 11a to separate this wall and the contents 12 of the bag. When the blade edge 18 has passed a substantial distance below the level of the bag contents, the arm 19 and the blade 17 are raised to leave the coupon wedged between the contents and the bag side wall.

As soon as the terminal coupon 10 has been stripped from the row in the chute, the row advances under the action of the weight 50 to move the next coupon into the terminal position. The next coupon advances until the free end portion of its long leg 10b engages the upper stops 35 and 43 and the fold 10c engages the lower stop ledges 36, the short leg 10a remaining on the chute side of the blade path until the blade moves to its retracted position above the coupons. As soon as the blade edge moves above the upper edge of the short leg 10a of this next leading coupon, the short leg swings outwardly across the blade path and against the stop flanges 42 in a position for the coupon to be stripped from the row in the chute 30 in the next downward movement of the blade.

It will be apparent that, with the novel method and apparatus described above, a coupon 10 may be inserted in a bag 11 after the latter has been filled with little disturbance of the material in the bag. This is made possible by folding the coupon and projecting the same endwise into the bag between the bag wall 11a and the bag contents 12. With one coupon leg 10a shorter than the other leg 10b, a plurality of coupons may be supported easily in a row with the short leg of the terminal coupon projecting beyond the row to facilitate stripping of this

coupon from the row by the blade during its bag entering movement past the end of the row. This novel apparatus may easily be added to and used in automatic packaging machines of the type in which open ended bags are advanced intermittently through a series of operating stations.

I claim as my invention:

1. In apparatus for inserting a flexible strip into an open topped bag, the combination of, a strip inserting station, conveyor means for supporting a plurality of open topped bags in a row and advancing the same edgewise and step by step to present the bags one by one to said strip inserting station, a blade movable back and forth along a path extending through the open top of a bag dwelling at said station, means operable in timed relation to advance of said bags by said conveyor means and during dwelling of a bag at said station first to advance said blade along said path from a retracted position spaced from the bag to an advanced position within the bag and then to move the blade reversely and back into said retracted position, and means at said station adapted to support a series of folded flexible strips and position the terminal strip in said path of said blade between said positions of the latter for removal of the terminal strip from the series and insertion of the strip into said bag in the movement of the blade from said retracted position to said advanced position.

2. In apparatus for inserting a flexible strip into a partially filled bag, the combination of, means for supporting a partially filled bag in a predetermined position with its open end up, a blade swingable edgewise along a predetermined path and back and forth between a retracted position spaced from said open end of a bag in said predetermined position on said supporting means and an advanced position within the bag and below the level of the contents thereof, a chute for storing a series of said strips with the terminal strip extending across said path between said positions of said blade for pick up by the blade and advance edgewise with the latter into said bag during the movement of the blade from said retracted position to said advanced position, and actuating mechanism for said blade operable first to advance the blade

to insert a strip into a bag in said predetermined position and then to retract the blade leaving the strip within the bag.

3. In apparatus for inserting a flexible strip into a partially filled bag, the combination of, means for supporting a partially filled bag in a predetermined position with its open end up, a blade swingable edgewise along a predetermined path and back and forth between a retracted position spaced from said open end of a bag in said position on said supporting means and an advanced position within the bag and below the level of the contents thereof, said path extending along the inner side of said side wall between the latter and said bag contents, means disposed between said positions of said blade and operable to support a flexible strip with portions thereof disposed on opposite sides of said path for pick up by the blade and advance edgewise with the latter between said bag side wall and said contents in the movement of the blade from said retracted position to said advanced position and actuating mechanism for said blade operable first to advance the blade to pick up said strip and wedge the same between said bag wall and said contents and then withdraw the same from the bag to leave the strip within the bag.

4. The method of inserting a folded coupon into a partially filled bag which comprises supporting said bag at a coupon-inserting station with its open end up, placing said coupon on a blade with the edge of the blade seated in the fold of the coupon, projecting said blade edgewise through said open end of said bag and downwardly into the latter and along one side wall thereof to separate the side wall and the contents of the bag, and, while maintaining said bag at said coupon-inserting station, moving said blade reversely to withdraw the blade from within said bag to leave said coupon wedged between said bag wall and the bag contents.

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