Jan. 31, 1956 C. B. HARKER 2,732,989

DISPENSING APPARATUS FOR DOUBLE BAGS

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Fig. 1

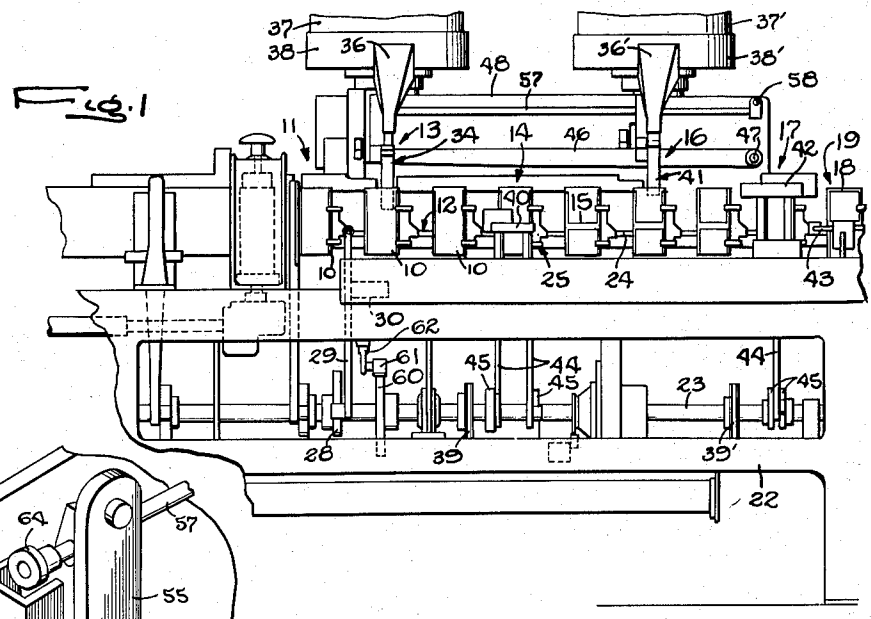


Fig. 2

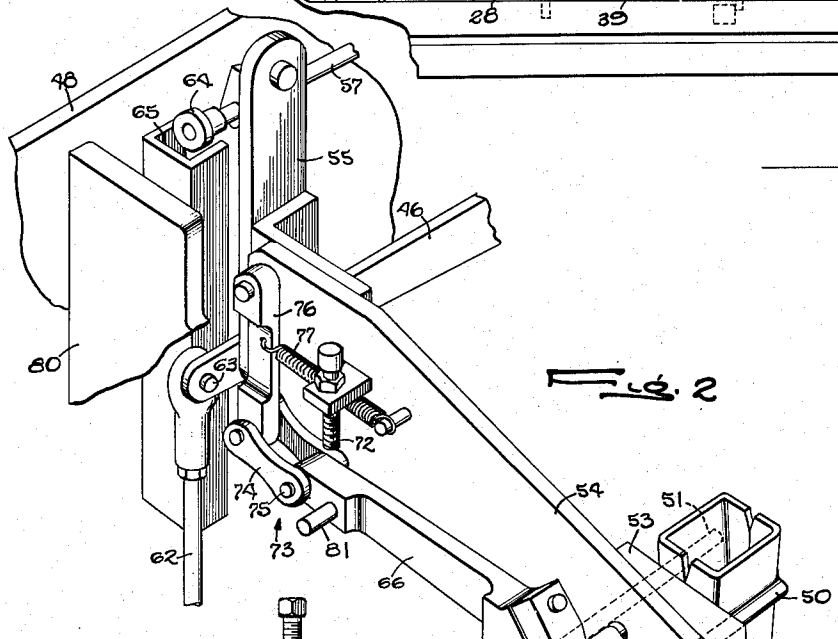
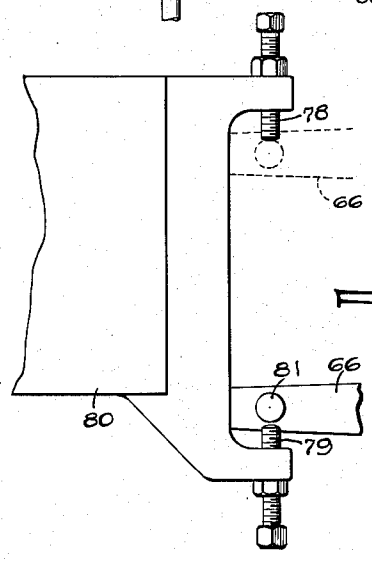


Fig. 3



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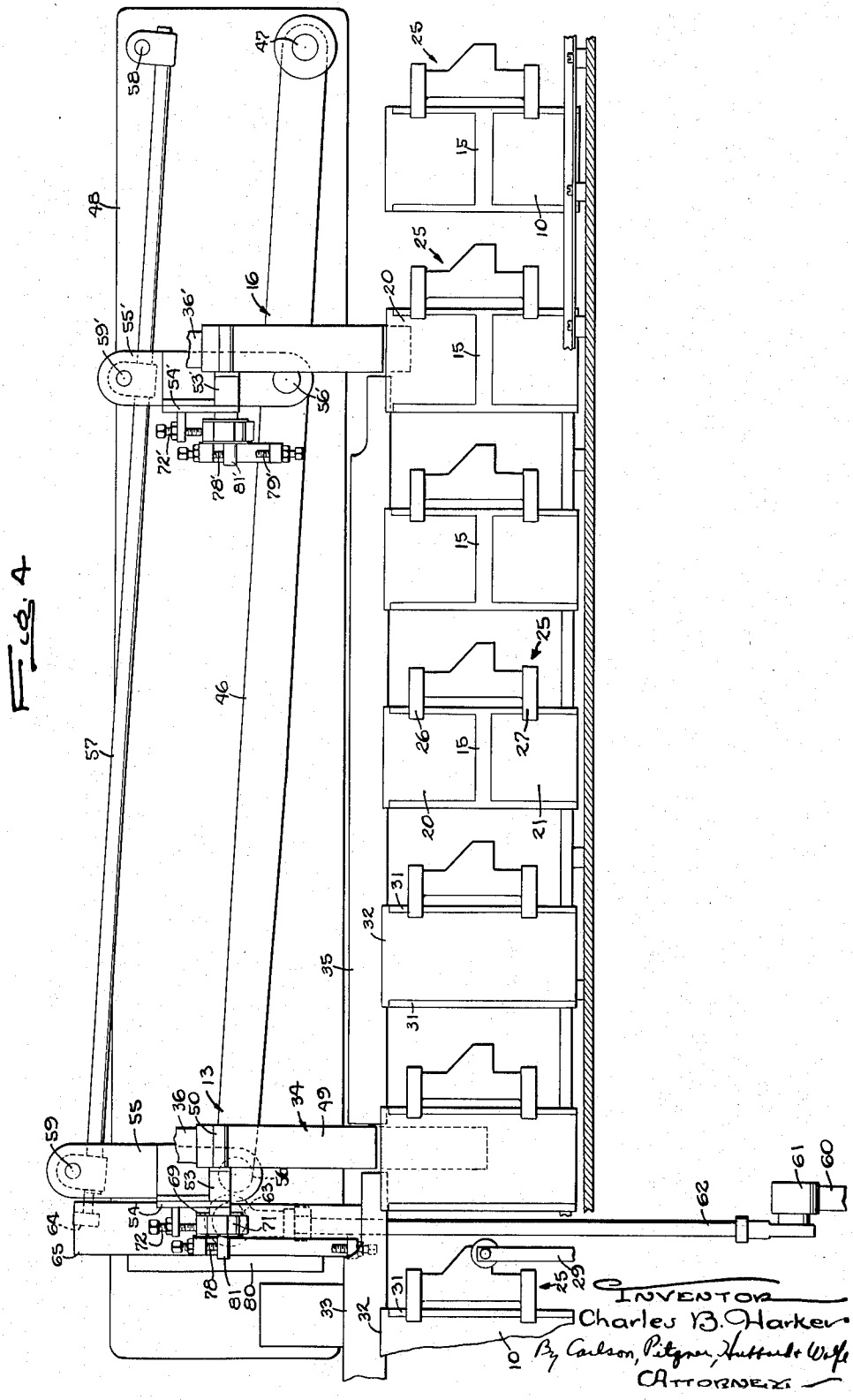


Fig. 4

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DISPENSING APPARATUS FOR DOUBLE BAGS

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Application September 27, 1952, Serial No. 311,905

3 Claims. (Cl. 226—59)

This invention relates to a dispensing apparatus for use in a packaging machine of the type in which a row of bags are supported open end up and advanced step by step to present each bag successively to a first filling station where the bottom portion of the bag is filled, then to a sealing station where the walls of the bag are joined together transversely intermediate the ends of the bag and then to a second filling station where the upper portion of the bag above the seal is filled. A machine of this general type is disclosed in the copending application of Harold L. Bartelt, Serial No. 283,962, filed April 23, 1952, now Patent Number 2,649,673. More particularly, the invention has reference to a dispensing device of the type in which a filling spout is lowered into a bag and then deposits the material to be packaged in the bag.

One object of the invention is to provide in a machine of the above character a new and improved dispensing apparatus in which a filling spout is disposed at each of the filling stations and the two spouts are lowered together but the spout at the first station is lowered farther than the other spout so that it discharges the material near the bottom of the bag while the other spout deposits the material in the top of the bag.

A more detailed object is to obtain the differential lowering of the filling spouts by mounting the two spouts on a lever which extends along the path of the bags and which is fulcrumed at a point beyond the second filling station so that the spout at the first filling station is farther from the axis of the lever than is the other spout.

Another object is to connect the two spouts by a parallelogram linkage to maintain the spouts upright as they are lowered into their respective bags.

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 side view of a packaging machine incorporating the novel dispensing apparatus of the present invention.

Fig. 2 is a fragmentary perspective view of a portion of the dispensing apparatus.

Fig. 3 is a fragmentary side view of the stops used to open the filling spouts.

Fig. 4 is an enlarged fragmentary elevation of the dispensing apparatus.

For the purposes of illustration, the invention is shown in the drawings embodied in a packaging machine in which a succession of bags **10** are delivered one by one at a loading station **11** to a carrier **12** for gripping and supporting the bags in spaced relation open end up and advancing the bags edgewise step by step through a filling station **13**, a station **14** at which a horizontal seal **15** is formed across the center of the bag, a second filling station **16**, a closing station **17** where a top seal **18** is formed and a cut-off station **19** where the cross seal **15** is severed intermediate its edges. At the first filling station, the material to be packaged is deposited in the bottom of the bag while, at the second filling station, the bag is filled

above the cross seal so that cutting the seal divides the bag into separate sealed bag sections or packages **20** and **21** (Fig. 4).

The various mechanisms used in the packaging operations are mounted on an elongated horizontal frame **22** and are operated in timed relation to each other from a horizontal camshaft **23** driven continuously by a suitable motor (not shown). As disclosed more fully in the aforesaid application, the carrier or conveyor **12** is in the form of an endless chain **24** driven intermittently from the camshaft through a suitable mechanism (not shown) and carrying a plurality of grippers **25** spaced at equal intervals along the conveyor. As shown in Fig. 4, each gripper comprises a pair of vertically spaced spring closed clamps **26** and **27** which grip respectively the upper and lower bag sections **20** and **21** along the leading edge of the bag. When a gripper is dwelling at the loading station **11**, a cam **28** (Fig. 1) on the shaft **23** acts on an upright follower lever **29** to rock the latter about a fulcrum **30** and open the clamps **26** and **27** in order to receive a bag delivered to the loading station. Before the next advance of the conveyor, the lever is rocked back permitting the clamps to close and grip the bag.

When a bag **10** is delivered to the loading station **11**, the margins of the front and back panels are sealed together as indicated at **31** (Fig. 4) from the bottom of the bag to a point short of the upper end so that the upper edge portions **32** of the bag may be held apart by a splitter blade **33** disposed above the bags and extending to the first filling station **13**. Thus, when the bag reaches the first filling station, its mouth is held open to receive a filling spout **34** which is lowered into the bag to fill the latter and then is lifted out of the bag. The spout is disposed in an opening between the splitter blade **33** and a similar splitter blade **35** mounted on the machine frame **22** and extending all the way to the second filling station **16**.

Material to be packaged is delivered to the filling spout **34** through a tube **36** disposed above and alined with the upper end of the spout. The material is stored in a hopper **37** and is measured out and delivered to the tube periodically in timed relation to the up and down movements of the spout by a suitable mechanism **38** of well known construction. Proper timing is achieved by driving the filler mechanism from a cam **39** on the shaft **23**.

After the spout **34** is retracted out of the bag **10**, the latter is advanced to the sealing station **14**, which herein is two steps from the filling station. At the sealing station, the cross seal **15** is formed by a sealing element **40** and the bag then is carried to the second filling station **16** where a spout **41** is lowered into the bag to fill the section **20** above the cross seal and then lifted out of the bag. As in the case of the spout **34**, material from a hopper **37'** is deposited in the spout **41** through a tube **36'**. From the second filling station, the bag is advanced to the sealing station **17** where the mouth of the bag is closed by a sealing element **42** and then to the cut-off sattion **19** where the bag sections **20** and **21** are severed by a knife **43**. The sealing elements **40** and **42** and the knife **43** are mounted on the upper ends of upright levers **44** which are similar to the lever **29** and are rocked during dwelling of the bags by cams **45** on the shaft **23**.

To lower each filling spout into the bag section in which the material it is carrying is to be deposited, the present invention contemplates the provision of a novel mechanism which moves the spouts **34** and **41** together during a dwell of the bags but which lowers the spout **34** down into the bag section **21** while lowering the spout **41** only a short distance to enter the bag section **20**. Herein this mechanism comprises an elongated lever arm **46** extending over the path of the bags from the first filling station **13** to a point **47** (Fig. 4) beyond the

second filling station 16 where it is fulcrumed on an upright frame plate 48 to swing about a horizontal axis normal to the bag path. The arm 46 carries the spouts 34 and 41 and, since the former is a greater distance from the fulcrum 47 than the latter, it is lowered farther into its respective bag when the arm is swung down about its axis.

Preferably, the two spouts 34 and 41 are of the so-called clam-shell type and, during vertical movement into and out of the bag, are respectively opened and closed. As shown in Fig. 2, the spout 34 comprises two clam-shell buckets 49 of channel cross section gradually tapering downwardly to a point and opening toward each other to form a closed and elongated receptacle when the flanges abut against each other. Near their upper ends, the buckets are welded or otherwise secured to parallel rockshafts 50 and 51 projecting through and journaled in a block 53 on the outer end of an arm 54 which is rigid with and projects forwardly from a vertical link 55. The lower end of the latter is connected to the lever arm 46 as indicated at 56 (Fig. 4) thus mounting the spout 34 on the arm for bodily movement therewith.

Means is provided for maintaining the spout 34 upright as it is lowered and raised into and out of the bag and, herein, is in the form of a parallelogram linkage. To provide the linkage, a second elongated lever arm 57 paralleling the first lever arm 46 and fulcrumed to the plate 48 at 58 above the fulcrum 47 is pivoted to the upper end of the link 55 as indicated at 59 and the connection 56 between the lower end of the link and the lever arm 46 also is in the form of a pivot. The pivots 56 and 59 are equal distances from the fulcrums 47 and 58 of their respective arms so that the two lever arms and the link constitute the parallelogram linkage. With this arrangement, the link remains vertical thus maintaining the spout 34 in an upright position as it is raised and lowered.

The lever arms 46 and 57 move downwardly by gravity and are raised by a cam 60 (Fig. 1) acting on the roller 61 of a follower link 62 which is pivotally connected at 63 (Fig. 2) to the outer end of the lever arm 46. In the upper position of the arms, the lower or sharpened end of the spout 34 is disposed, as shown in full in Fig. 4, slightly above the upper open end of the bag dwelling at the station 13. Since the upper edge portions 32 of the bag panels are held apart by the splitter blades 33 and 35, the tip of the spout enters the mouth of the bag and separates the bag panels as the spout is lowered to the position shown in broken lines. To guide the arms and maintain the lower end of the spout when closed in the plane of the bag one or more rollers 64 secured to the link 55 ride in a vertical channel 65 on the plate 48.

In the present instance, the up and down motions of the spout support are utilized to open the spout 34 after entry into the bag and close the spout as it is retracted from the bag. For this purpose, an elongated lever 66 (Fig. 2) lies alongside the spout support 54 and near its forward end is secured to the rockshaft 51 which forms the fulcrum of the lever. The outer short end 67 of the lever is pivotally connected at 68 to one end of a link 69 inclined upwardly and across the dividing line between the buckets 49 and pivoted at 70 to the free end of a crank 71 fast on the rockshaft 50 and of a length equal to that of the arm 67. By rocking the lever 66 vertically through a small angle, the rockshafts 50 and 51 will be turned opening and closing the buckets 49. The spout closing movement is limited by engagement of the bucket edges while a stop 72 on the support 54 engages the lever 66 to determine the extent of the opening movement.

Preferably, the buckets 49 are opened and closed with a snap or over-center action and, for this purpose, the rear end portion of the lever 66 constitutes one link of a toggle 73 which includes a second link 74 pivotally connected at 75 to the lever and at its other end to the end of an arm 76 pivotally suspended from the support 54. A contractile spring 77 acts on the arm 76 to hold the toggle flexed with the spout 34 either open or closed. Flexing of the toggle links 66, 74 past the dead center position is effected by opposed stops 78 and 79 (Fig. 3) adjustably mounted in vertically spaced relation on a projection 80 extending forwardly from the plate 48. Near the upper limit of the retracting movement of the spout 34, a pin 81 on the lever 66 encounters the stop 78 causing the lever in the final retracting movement of the spout to be swung downwardly relative to the arm 54 and past the dead center position thus bringing the edges of the buckets 49 together. In a similar way, the stop 79 blocks the movement of the pin 81 as the arms 46, 57 are swinging downwardly to lower the spout 34 into the bag, the toggle links 66 and 74 being flexed upwardly and then over-center to a position against the stop 72. The spout thus is opened allowing the charge of material carried thereby to fall by gravity into the bag.

The mechanism for opening the spout 34 as described above forms the subject matter of my copending application Serial No. 313,145, filed October 4, 1952.

The spout 41 at the second filling station 16 is constructed, mounted and actuated in the same manner as the spout 34 and the corresponding parts thereof are indicated by the same but primed reference numerals. In this case, however, the link 55′ cooperates with the lever arms 46 and 57 to form the parallelogram linkage for holding the spout upright. Since, as previously described, the link 55′ is secured to the arms 46 and 57 closer to the fulcrums 47 and 58 than the link 55, the spout 41 is moved through a correspondingly shorter distance and therefore enters the bag to a point above the cross seal 15. Thus the spout moves up and down between the positions shown in full and dotted outline in Fig. 4.

From the foregoing, it will be apparent that, since both filling spouts 34 and 41 are raised and lowered together in response to the movement of the single actuating link 62, the dispensing mechanism is comparatively simple and is easy and inexpensive to manufacture. At the same time, each spout is lowered the proper distance, the spout 34 into the bag section 21 and the spout 41 into the section 20, so that each charge of material is dispensed directly into the section in which it is to be packaged. By using the two lever arms 46 and 57 to form a parallelogram linkage, the spouts are held upright for accurate entry into the bags.

I claim as my invention:

1. In a packaging machine having first and second stations horizontally spaced successively along a path of advance of bags to be filled, the combination of, a frame, a lever disposed above said path and fulcrumed on said frame at a point beyond said second station to swing about a horizontal axis extending transversely of the path, a filling spout disposed above said second station and mounted on said lever for bodily movement therewith, a second filling spout similarly mounted on said lever and disposed above said first station, a camshaft journaled on said frame, a cam carried by said camshaft, and a follower connected to said lever and engaging said cam to swing said lever about said axis thereby to lower said first spout a predetermined distance into a bag dwelling at said second station and said second spout a greater distance into a bag at said first station.

2. In a dispensing apparatus, the combination of, a first lever fulcrumed at one end to swing about a first horizontal axis, a second lever paralleling said first lever and fulcrumed adjacent said first axis to swing about a second and parallel axis, a first link pivoted to said first lever a predetermined distance from said first axis and to said second axis the same distance from said second axis, a second link disposed between said first link and said axes and similarly pivoted to said levers, a pair of filling

spouts, one mounted on each of said links, and mechanism for swinging said levers about said axes.

3. In a dispensing apparatus, the combination of, a frame, a lever fulcrumed at one end on said frame to swing about a horizontal axis, a first filling spout mounted on said lever, a second filling spout mounted on said lever between said first filling spout and said axis, mechanism for swinging said lever about said axis, and a link paralleling said lever and pivotally connected to said spouts to form with the lever a parallelogram linkage for maintaining the spouts vertically disposed during swinging of the lever.

References Cited in the file of this patent

UNITED STATES PATENTS

648,138 Adams et al. ---------- Apr. 24, 1900