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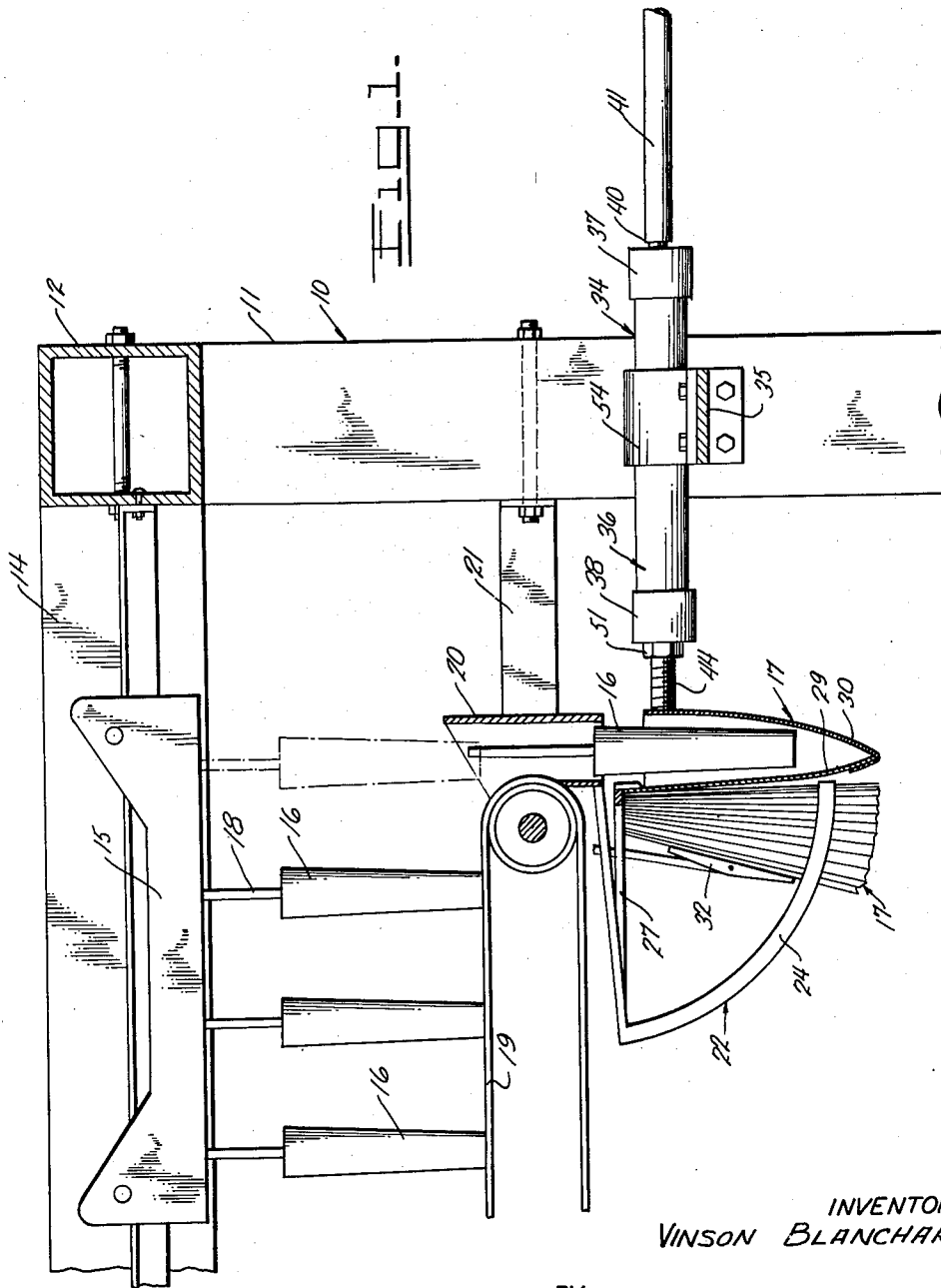
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CONFECTION PACKAGING MACHINE HAVING CONFECTION CONVEYING
MEANS AND A HORIZONTALLY ARRANGED SUCTION MEANS
FOR OPENING BAGS TO RECEIVE THE CONFECTIONS

Filed May 20, 1949

2 Sheets-Sheet 1



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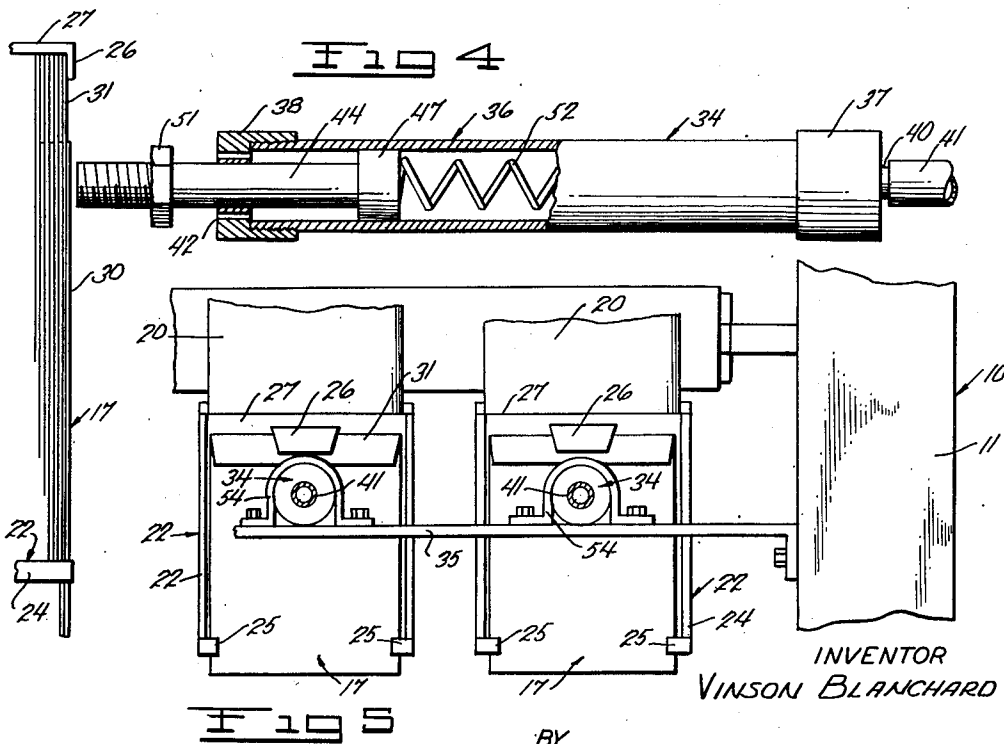
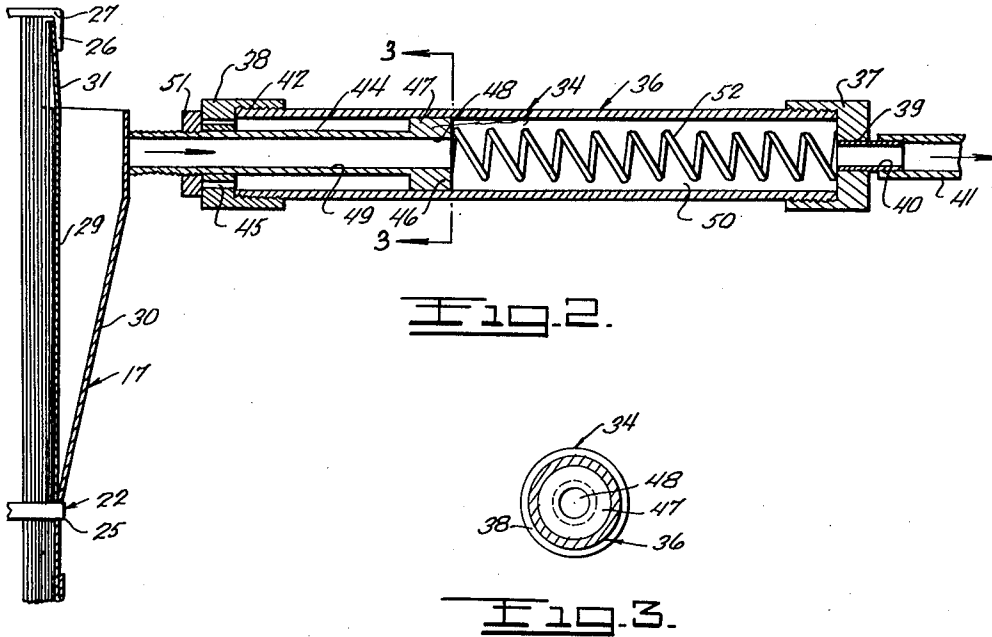
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CONFECTION PACKAGING MACHINE HAVING CONFECTION CONVEYING MEANS AND A HORIZONTALLY ARRANGED SUCTION MEANS FOR OPENING BAGS TO RECEIVE THE CONFECTIONS

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2 Claims. (Cl. 226—2)

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This invention relates to an automatic bag-opening device, and more particularly to an automatic bag-opening device for an article-packaging machine.

It is an object of this invention to provide a novel bag-opening device for packaging articles, as ice cream bars and the like, the bag-opening device being spring pressed for engagement with the bags in a magazine and actuated by a vacuum-operated piston for opening the bag.

Another object of this invention is to provide an efficient bag-opening device of the kind to be more particularly described hereinafter, which is spring pressed into engagement with the end bag in a magazine and actuated by a vacuum to bag-opening position, the bag being positioned for coacting with the opening device to effect the opening movement.

Still another object of this invention is to provide a bag-opening device of this kind which depends for its operation upon the relative positioning of the bag to be opened. Heretofore, directed streams of air under pressure have been directed toward the open end of the bag and the misdirection of the air stream or slight out-of-line positioning of the end bag of a magazine would preclude the successive opening of the bags, thereby resulting in an inefficient packaging device requiring very close adjustment to obtain the operation. With the bag-opening device formed according to an embodiment of this invention, the bags will be successively opened on the magazine to receive an article to be contained therein and upon receiving the article the bag will be removed from the opening device resulting in the instantaneous actuation of the device for opening a following bag.

With the above and other objects in view, my invention consists in the arrangement, combination and details of construction disclosed in the drawings and specification, and then more particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a side elevation of a bag-opening device constructed according to an embodiment of my invention mounted on an article-packaging machine, the article-packaging machine being partly broken away and partly in section;

Figure 2 is a longitudinal section through the bag-opening cylinder and piston of this invention, showing the piston rod in engagement with a bag and the position of the piston and bag in the bag-opening position;

Figure 3 is a transverse section taken on the line 3—3 of Figure 2;

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Figure 4 is a side elevation, partly broken away and partly in section, of the bag-opening device showing the piston and piston rod in the extended position prior to engagement with a bag to be opened;

Figure 5 is a front elevation of the bag-containing magazine, showing the bag-opening device in its proper position relative to the bags contained in the magazine and showing the bag-opening device partly broken away and partly in section.

Referring to the drawings, the numeral 10 designates generally a packaging machine for packaging small articles in a bag or other expandable container. The article-packaging machine 10 is particularly designed for packaging small articles, as ice cream bars and the like. The packaging machine 10 includes supporting brace members 11 and 12 at one end thereof and longitudinally-extending bracing means 14 connected to the vertical supporting means 11 and 12, as at the corners. A conveyor member 15 is slidably supported on the longitudinally-extending frame members 14 for sliding along the length thereof, and is formed for securing a plurality of articles 16 to be packaged in the bags 17. The ice cream bars or candy 16 which are formed on a stick 18, are generally formed at the opposite end of the packaging machine 10, and the plurality of articles 16 are carried by the carrier or conveyors 15 to the end of the packaging machine 10 shown in the drawings, at which time the separate articles 16 are dropped from the carrier 15 into the opened bags 17 and will fall from the bag-opening device downwardly to a conveyor, not shown in the drawings, whence the packaged articles will be removed for storage or further packaging for distribution. A conveyor element or conveyor 19 is also formed on the packaging machine 10 and engages the lower ends of the ice cream bars 16 for moving the ice cream bars and the carrier along the length of the machine to the position where the bars or articles 16 will be released from the carrier 15.

A guide chute 20 is fixed on the supporting member 10 by a bracket 21 and the upwardly-opening tubular guide member 20 is disposed in a position for receiving the endmost article 16 as it is dropped or discharged from the carrier 15. The guide member 20 is substantially tubular in configuration, being open at the opposite ends thereof for guiding the article 16 as it is dropped from the carrier 15 into the bag 17 which is supported in an open position below the lower open end of the funnel or guide member 20.

A bag-containing magazine 22 is supported on the packaging machine 10 below the carrier 15 and conveyor 19 and is provided for supporting a plurality of bags 17 in a position where the bags may be moved from their closed folded position to an open extended position for receiving the article 16. The magazine 22 is formed for supporting a plurality of bags 17 therein and includes segmental arcuate side members 24 for engagement along the side edges of the package of bags 17 to be contained therein. Inturned lugs or fingers 25 are carried by the segmental frame members 24 at their forward ends for engagement over the side edge of a portion of the foremost bag 17 in the package contained within the magazine. A depending lug or finger 26 is supported above the inwardly-extending fingers 25 for engagement with the upper transverse edge of the most forward bag 17 in the magazine. The depending lug or finger 26 is carried by a supporting frame 27 which is fixed at its rear end to the rear upper ends of the segmental frame members 24 and extends over the top edge of the package of bags 17 contained within the magazine 22.

The bags 17 are of a substantially conventional configuration, being formed of a sheet of paper folded together to define a rear wall 29 and a forward wall 30. The front and rear walls 29 and 30 are either formed integrally along the side edges thereof or are secured together by other suitable fastening means, and the lower edges of the front and rear panels 29 and 30 are secured together by folding the forward panel 30 upwardly over the rear surface of the lower edge of the rear panel 29, as clearly shown in Figure 1 of the drawings. To provide for the ready opening of the upper open end of the bag 17 when an article 16 is contained therein, the rear wall 29 extends upwardly beyond the upper edges of the side walls and the front wall 30. The upward extension 31 of the rear wall or panel 29 is substantially greater than the downwardly-extending length of the depending finger 26, whereby the finger 26, when engaged with the upper edges of the forwardmost bag 17 will only engage over the upper edge of the rear wall or panel 29, leaving the upper edge of the front panel 30 free to be moved forwardly by the bag-opening device to be described hereinafter. As each of the bags 17 has this extension 31 at the upper edge thereof, a compact package of bags 17 will provide a substantially arcuate package, and, therefore, the side bars 24 of the magazine 22 are formed in an arcuate manner to substantially conform to the segmental configuration of the package of bags 17 to be contained within the magazine. A follower 32 is swingably supported on the packaging machine 10 and engages the rearmost bag 17 in the package for pressing the package forwardly in the magazine for engaging the forwardmost bag with the retaining fingers or members 25 and 26.

The foremost bag 17 within the magazine 22 is supported in substantial vertical alignment with the guide member 20, whereby the bag 17, when opened, will be suitably positioned for receiving the article 16 as it is guided through the guide member 20.

For opening the forwardmost bag 17 in the magazine 22, I have provided a bag-opening device 34, which is adapted to be secured to the frame 11 forwardly of the magazine 22 for engagement with the most forward bag 17. As a

plurality of magazines 24 and article carriers 15 may be contained on a single packaging machine 10, there is provided a transverse supporting bar 35 which is fixed to the vertical supporting member 11 for supporting the bag-opening devices 34 constructed according to an embodiment of my invention.

The bag-opening device 34 constructed according to an embodiment of this invention is formed of an elongated cylindrical body or casing 36 open at the opposite ends thereof having a cap or cover member 37 closing one end, the outer end, and a cap member 38 closing the other inner end. The cap 37 is threadably engaged over the outer threaded end of the cylinder 36 and is formed with a central aperture 39 therein within which a nipple or conduit means 40 may be engaged. The nipple 40 is securely fastened in the aperture or opening 39 and extends outwardly beyond the rear end of the cover 37. A suitable flexible tube 41, or other suitable air or suction-conducting means is adapted to be connected to the outwardly-extending portion of the nipple 40 to provide a vacuum within the cylinder 36.

The cap 38 at the inner end of the cylinder 36 is threadably engaged on the inner end of the cylinder and is formed with a central aperture 42 therein through which the tubular piston rod 44 is adapted to be slidably engaged. Air vent openings 45 are also formed in the front wall of the cap 38 to provide for the proper venting of the cylinder 36 forwardly of the piston 46 upon sliding of the piston within the cylinder. A piston element 47 is fixed to or formed on the inner end of the tubular piston rod 44 and is formed with a central opening 48 in communication with the longitudinally-extending opening 49 through the center of the piston rod 44. The longitudinally-extending opening 49 and the aperture 48 provide a continuous passage through the length of the piston rod 44 and the piston 47 communicating the outside conditions with the outer end 50 of the cylinder 36. A stop element or nut 51 is threadably engaged on the forward end of the piston rod 44 for suitable adjusted positioning along the length thereof, the stop element or nut 51 being engageable with the forward end of the cylinder 36, the forward wall of the cap 38, for limiting the inward extension of the piston 47 and piston rod 44 as effected by the vacuum applied to the cylinder 44 through the tubular element 41 and connector 40. A resilient coil spring 52 is contained within the cylinder 36 for constantly biasing the piston 47 and piston rod 44 to outwardly-extending, extended position. The forward end of the coil spring 52 engages the inside or rear end of the piston 47 and the other or outer end of the spring 52 engages the inside wall of the outer cover member 37.

The cylinder 36 is secured along the length of the supporting bar 35 by suitable supporting brackets 54 or other suitable fastening and positioning devices which are fixedly secured along the length of the supporting bar 35. The bag-opening device 34 is so positioned on the supporting bar 35 that the forward open end of the piston rod 44, in its fully-retracted position within the cylinder 36, will be disposed in substantial vertical alignment with the forward vertical side of the guide member 20 for properly positioning the opened bag 17 below the lower open end of the chute 20.

The spring 52 engaging between the cylinder

36 and piston 47 will constantly bias the piston 47 and piston rod 44 outwardly through the inner open end for engaging the inner open end of the rod 44 with the front wall 30 of the most forward bag 17 contained within the magazine 22. The vacuum means, not shown in the drawings, may be then applied to the outer end 50 of the cylinder 36 for continually forming a vacuum in the outer end of the cylinder 36. With the piston rod 44 in its extended position, as shown in Figure 4 of the drawings, the front wall 30 of the most forward bag 17 will engage the forward end of the rod 44 and close the opening therein, whereby the vacuum within the cylinder 36 will draw the piston 47 inwardly of the cylinder. The vacuum will effect the secure fastening of the front wall 30 to the forward end of the piston rod 44 and as the front open end of the piston rod 44 is then closed, the vacuum in the rear end of the cylinder 36 will draw the piston inwardly until stopped by the stop member 51 engaging the forward end of the cylinder. Upon retraction of the piston rod 44 within the cylinder 36, the front wall 30 of the bag 17 will be moved forwardly in spaced relation to the rear wall 29, as clearly shown in Figure 2 of the drawings, and as the upward extension of the rear wall 29 is engaged in the retaining lug 26, the bag 17 will be suitably supported in its open condition below the article-guide-chute 20. As the articles are dropped from the carrier 15, they will be engaged through the guide member 20 and into the upper open end of each of the forwardmost bags 17 and the weight of the article 16 within the bag 17 will effect the downward sliding of the bags 17 out of engagement with the retaining lug 26 and out of engagement with the forward open end of the piston rod 44. The bag 17 containing the articles 16 is then dropped onto a suitable conveyor, not shown in the drawings, for conveying the packaged articles for further processing for distribution. As the forwardmost bag 17 is slid downwardly out of engagement with the retaining lugs 25 and 26 and out of engagement with the forward open end of the piston rod 44, the piston-retracting effect of the vacuum within the rear end 50 of the cylinder 36 is broken and the spring 52 will again press the piston 47 and piston rod 44 to outwardly-extending position for engaging the next and succeeding bags 17.

I do not mean to confine myself to the exact details of construction herein disclosed, but claim all variations falling within the purview of the appended claims.

I claim:

1. In an article packaging machine, a first horizontally disposed conveyor adapted to support and convey a plurality of confections in upright position to the discharge end thereof, a second conveyor positioned in parallel spaced relation with respect to said first conveyor and engageable with the adjacent ends of said confections, a vertically disposed guide chute positioned adjacent the discharge end of said first conveyor, a magazine adapted to contain a plurality of bags in side by side vertical stacked position positioned below said first conveyor and said chute and facing toward said chute, and a horizontally disposed bag opening device having one end facing said magazine and mounted for movement toward and away from said magazine, said device comprising a horizontally disposed closed ended hollow casing positioned in

end to end relation with respect to said magazine and spaced from the latter, a piston positioned within said casing and mounted for sliding movement therein, a hollow piston rod extending through one of the closed ends of said casing and having one end extending through and secured to said piston, the other end of said piston rod projecting out of and terminating at a point beyond said one closed end of said casing, port openings formed in said one closed end of said casing, spring means positioned within said casing and having one end bearing against said piston and having the other end bearing against the other closed end of said casing for biasing the projecting end of said piston rod toward said magazine, and conduit means extending through the other end of said casing and adapted to be attached to a source of suction conducting means.

2. In an article packaging machine, a first horizontally disposed conveyor adapted to support and convey a plurality of confections in upright position to the discharge end thereof, a second conveyor positioned in parallel spaced relation with respect to said first conveyor and engageable with the adjacent ends of said confections, a vertically disposed guide chute positioned adjacent the discharge end of said first conveyor, a magazine adapted to contain a plurality of bags in side by side vertical stacked position positioned below said first conveyor and said chute and facing toward said chute, and a horizontally disposed bag opening device having one end facing said magazine and mounted for movement toward and away from said magazine, said device comprising a horizontally disposed closed ended hollow casing positioned in end to end relation with respect to said magazine and spaced from the latter, a piston positioned within said casing and mounted for sliding movement therein, a hollow piston rod extending through one of the closed ends of said casing and having one end extending through and secured to said piston, the other end of said piston rod projecting out of and terminating at a point beyond said one closed end of said casing, port openings formed in said one closed end of said casing, spring means positioned within said casing and having one end bearing against said piston and having the other end bearing against the other closed end of said casing for biasing the projecting end of said piston rod toward said magazine, conduit means extending through the other end of said casing and adapted to be attached to a source of suction conducting means, and stop means on the projecting end of said piston rod and engageable with said one closed end of said casing for limiting the movement of said piston rod away from said magazine.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,589,800	Frank	June 22, 1926
2,051,483	Jones	Aug. 18, 1936
2,183,293	Leach	Dec. 12, 1939
2,215,458	Backhouse	Sept. 24, 1940
2,247,787	Schmidt	July 1, 1941
2,341,521	Baker et al.	Feb. 15, 1944
2,355,500	Anderson	Aug. 8, 1944