

June 24, 1930.

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1,765,416

FEEDER MECHANISM FOR ASSEMBLING AND PACKAGING MACHINES

Original Filed March 22, 1926 3 Sheets-Sheet 1

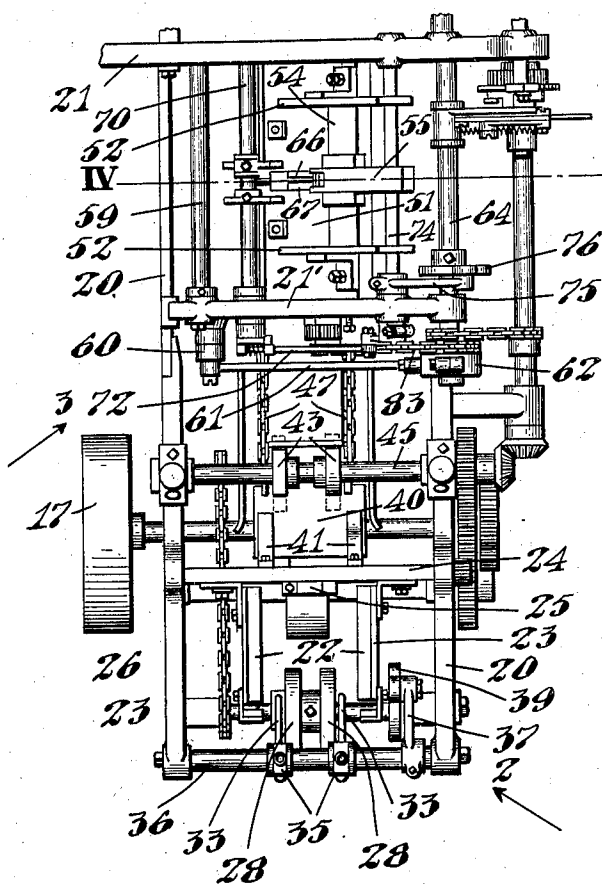


Fig. 1.

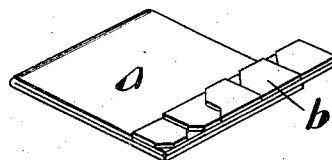


Fig. 7.

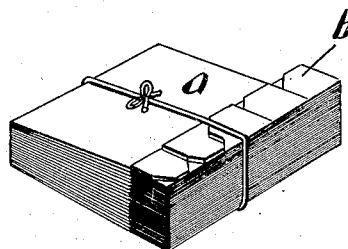


Fig. 8.

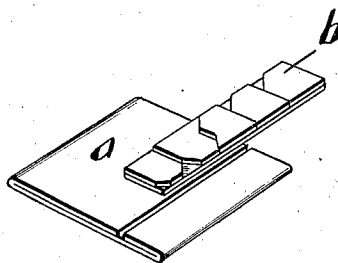


Fig. 6.

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FEEDER MECHANISM FOR ASSEMBLING AND PACKAGING MACHINES

Original Filed March 22, 1926 3 Sheets-Sheet 2

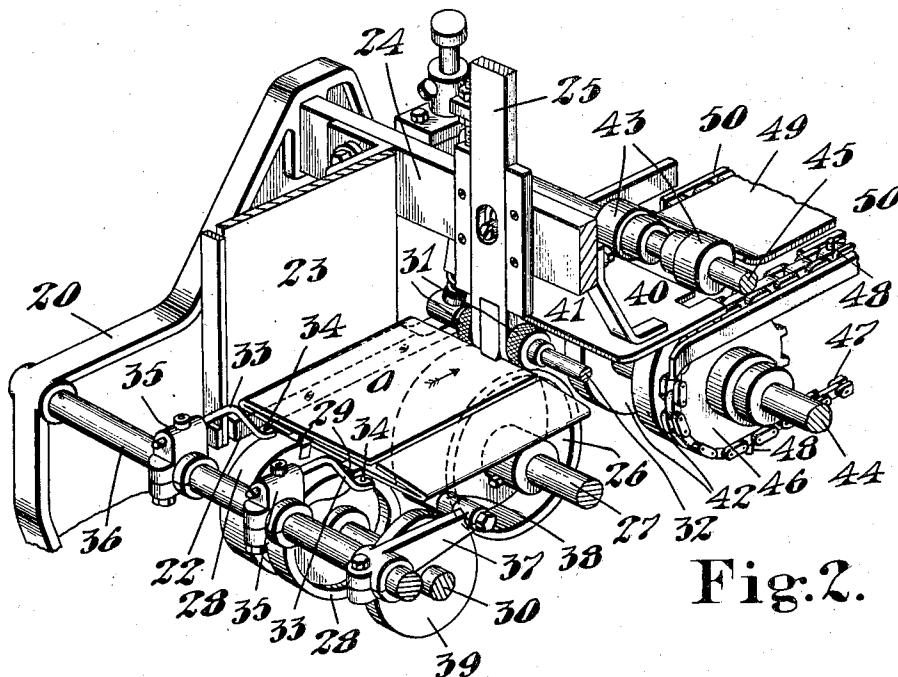


Fig. 2.

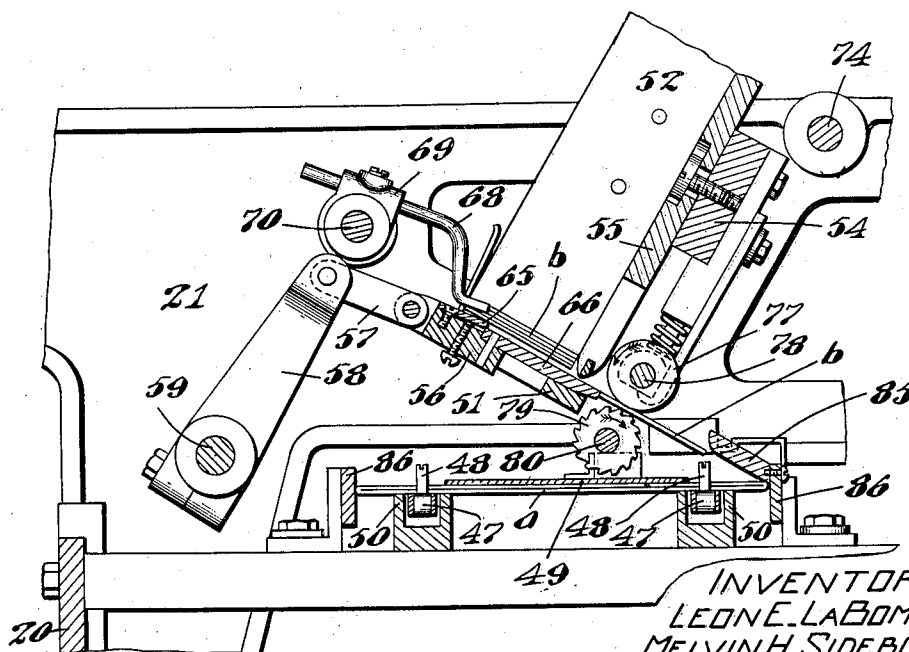


Fig. 4.

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FEEDER MECHANISM FOR ASSEMBLING AND PACKAGING MACHINES

Original Filed March 22, 1926 3 Sheets-Sheet 3

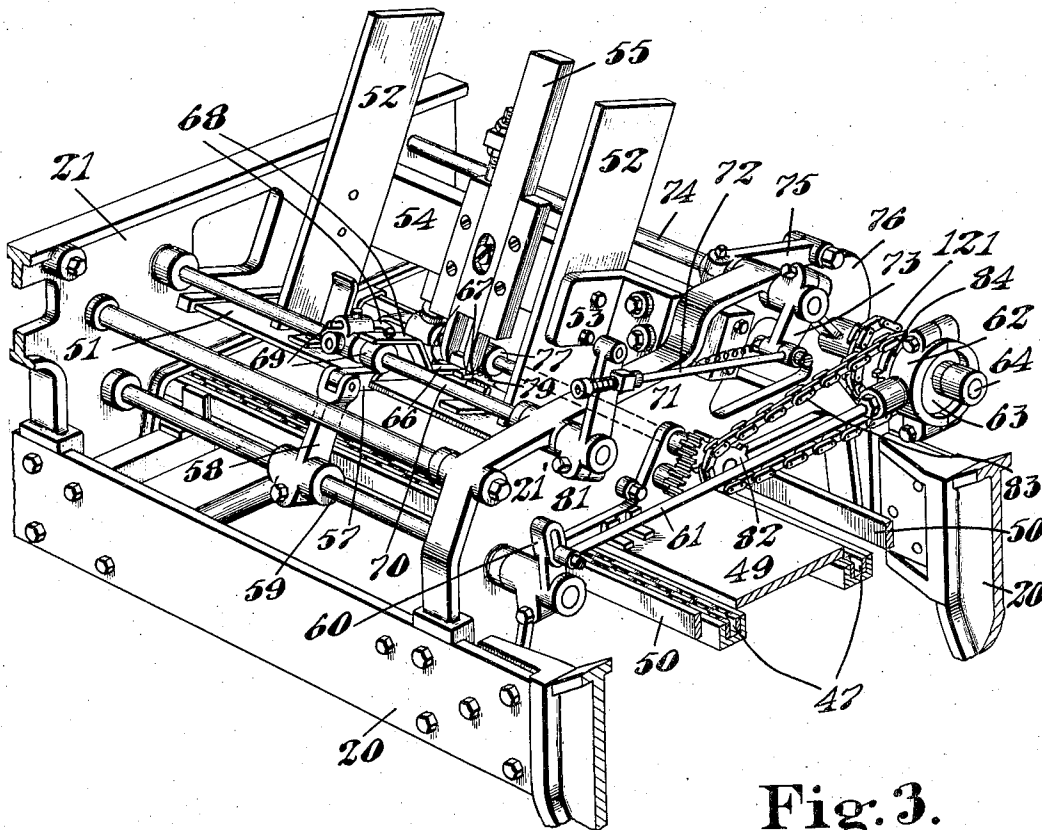


Fig. 3.

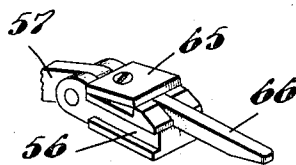


Fig. 5.

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UNITED STATES PATENT OFFICE

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FEEDING MECHANISM FOR ASSEMBLING AND PACKAGING MACHINES

Original application filed March 22, 1926, Serial No. 96,649. Divided and this application filed July 3, 1928. Serial No. 290,220.

This invention relates to mechanism for feeding articles from a plurality of sources of supply such as hoppers or magazines, and the invention has particular reference to means for so feeding flat-folded paper egg boxes and an equal number of fillers or racks that the boxes and racks can be automatically assembled as explained in our application which became Letters Patent No. 1,717,696 dated June 18, 1929, of which former application the present one is a division.

In the use of egg boxes, partitioning is required to separate the eggs. Such partitioning is known as fillers or racks. To save space when storing or shipping, it is customary to produce the boxes and fillers in flat folded form as illustrated, for instance, respectively, by Figure 19 of Letters Patent No. 1,488,756, granted to us April 1, 1924, and Figure 6 of Letters Patent No. 1,534,006, granted to us April 14, 1925. When the fillers have been put in packages separate from the flat boxes, users had more or less trouble when preparing to pack eggs; and sometimes the fillers and boxes reaching the users were not equal in number. This led to the custom of associating one filler with each box, doing this by hand which took time, with the filler inside the box.

A particular object of the present invention is to feed the fillers and boxes into assembled relationship and in such manner that there will be one filler adjacent to each flat folded box, in order that packages may be made of numbers of the fillers and boxes as explained in the application hereinbefore referred to.

With said object in view, the invention consists in mechanism substantially as hereinafter described and claimed.

Of the accompanying drawings:—

Figure 1 is a plan view of so much of the complete machine as is necessary to refer to in connection with the feeding mechanism.

Figure 2 is a perspective view looking in the direction of the arrow 2, Figure 1, illustrating the mechanism for feeding the flat folded boxes.

Figure 3 is a perspective view of the mechanism for feeding fillers such as shown at b, Figure 6, said Figure 3 being a view looking in the direction of the arrow 3, Figure 1.

Figure 4 represents a section on line 4—4, Figure 1.

Figure 5 is a detail perspective view of parts shown in Figure 4.

Figure 6 is a perspective view of a flat folded box and filler in the relative positions which they occupy as they are fed to proper relationship.

Figure 7 is a perspective view of the same articles when both are fed to superposed relationship.

Figure 8 is a perspective view illustrating the final product of the complete machine illustrated and described in the Patent 1,717,696 referred to.

Similar reference characters designate similar parts or features in all of the views.

The side walls 20 of the frame of the machine support two hoppers and feeding mechanisms for the flat boxes a and the flat or collapsed fillers b. To support a pile of the boxes a, strips 22 are provided, said strips being carried by side wall members 23 of the hopper, said side members being supported by a cross bar 24 of the frame (Figs. 1 and 2). Also supported by said cross bar is a vertically adjustable gate strip 25 the lower end of which is spaced from a wheel 26 carried by shaft 27 to provide an outlet for the lower box of a pile in the hopper.

To advance the flat folded boxes singly from the bottom of a pile in the hopper, we provide a pair of wheels 28, each having a pushing shoulder 29, said wheels being carried by a shaft 30. Each time that the wheels 28 revolve, a box is started forward through the outlet under the gate strip 25 so that said box will be gripped by the coaction of wheel 26 and a pair of small driven wheels 31 carried by a shaft 32 which is suitably driven as by gearing indicated in Figure 1.

Owing to the fact that the flat folded boxes are not of uniform thickness, because

there are so many portions of each box-blank over-folded, one upon another, there is always a liability of a second box following the first one as soon as the first or bottom one has advanced partly through the hopper outlet, unless some provision is made to prevent such a following and result in jamming the outlet. To prevent any second box from being started through the outlet until the bottom one has passed entirely through the outlet, we provide a pair of oscillating fingers 33 (Figs. 1 and 2), each having a sharp pin 34 rising from its tip. Each finger is adjustably mounted in a block 35 which is clamped upon a rock shaft 36 having an arm 37 carrying a roll 38 which rides on the periphery of a cam 39 carried by shaft 30.

In the operation of this feed mechanism, the shaft 36 is actuated so that the pins of the fingers 33 will be lowered below the plane of the bottom box when the shoulders of the feed wheels 28 engage the rear edge of the box and start it forward, said fingers then rising so as to slightly lift the rear edge of the next box, the pins 34 puncturing the material of the said next box sufficiently to prevent it from being started forward through the hopper outlet, due to the friction of the bottom box under it during the movement of the latter while it is being completely carried forward by the coaction of the wheels 26 and 31.

Each box fed from its hopper passes under a plate 40 supported by arms 41 depending from the cross bar 24, said box then passing to the nipper rolls 42, 43, the former being carried by a shaft 44 and the latter by a shaft 45. The shaft 44 carries, loosely mounted thereon, a pair of sprockets 46 for chains 47 having pushing pins 48. The chains 47 are closer together than the width of the folded boxes so that the said folded boxes extend over the chains as indicated in Figure 4. To retain the boxes on the chains a suitably supported plate 49 is provided, and there are smooth surfaced bars 50 on which the boxes ride so that each box is frictionally held back by the plate 49 and bars 50, and after it leaves the nipper rolls 42, 43, it will remain substantially stationary until a pair of the pins 48 carried by the chains 47 catch up with the rear edge of said box and cause it to travel forward and pass under the mechanism which delivers one filler *b* in proper position on top of a box *a*. The mechanism for so feeding and depositing the fillers is best shown in Figures 3 and 4. It is supported by suitable portions of the frame of the machine including a cross casting 21'. The bottom of the hopper for the fillers comprises a plate 51 (Fig. 3) the ends of which are rigidly mounted in the frame. The side walls 52 of the hopper are supported by brackets 53

secured to a cross bar 54. Also supported by the cross bar 54 is an adjustable gate strip 55. Mounted to reciprocate in a guideway in the hopper plate 51 is a slide 56 (Figs. 4 and 5) which is connected by a link 57 with an arm 58 of a rock shaft 59 (Fig. 3) suitably mounted in the frame and having an arm 60 connected by a link 61 with the eccentric strap 62 of an eccentric 63 carried by a shaft 64, said shaft being actuated by gearing that will operate it in proper time to cause the slide 56 to effect feeding of a filler *b* through the outlet of the hopper each time that a box *a* arrived under the filler hopper.

For the purpose of ejecting each bottom filler out from the hopper, the slide 56 is provided with a pushing ledge 65, preferably mounted as indicated in Figures 4 and 5 so that it can be adjusted to cause its pushing edge to be raised more or less according to the thickness of the articles to be ejected from the hopper. Projecting forward from the slide 56 is a flat-surfaced finger 66 which reciprocates or slides between a pair of blocks 67 (Fig. 3) said blocks cooperating with the bifurcated lower end of the gate strip to form the outlet for a filler *b*. The finger 66, by reciprocating between the blocks 67 as described, always ensures accuracy in the vertical width of the outlet for the fillers, and prevents the existence of any shoulders that might interfere with the feeding passage of a filler. In other words, this structure provides smooth surfaces which permit free passage of the fillers although the latter, collapsed as shown in Figure 6, has several transverse edges that would readily catch against any shoulder existing in the gate outlet.

To avoid liability of a second filler being started through the outlet by the passage of a lower filler, we provide a pair of fingers 68 (Figs. 3 and 4) adjustably mounted in blocks 69 carried by a rock shaft 70, the tips of the fingers being located in position to engage under the rear edge of a second filler immediately after a lower filler has been started forward. To cause the tips of the fingers 68 to rise and fall at the proper times, the rock shaft 70 has an arm 71 connected by a link 72 with an arm 73 of a rock shaft 74 (Figs. 1 and 3). The rock shaft 74 has another arm 75 provided with a roll which is acted upon by a cam 76 carried by the shaft 64, said cam 76 acting through the connections just described to raise and lower the fingers for the purpose described which is substantially the same as the purpose of the fingers 33 employed in connection with the feeding of the boxes illustrated by Figure 2.

Each filler *b* ejected through the outlet of the filler hopper, under the gate strip 55,

is positively transferred to proper position upon a marginal portion of a box *a* which arrives and temporarily stops beneath it, a succession of such operations resulting in the fillers and flat boxes alternating with each other when superimposed in a pile such illustrated by Figure 8. To effect such ejection of the fillers *b*, we provide one or a pair of rolls 77 (Fig. 4) carried by a shaft 78, and one or a pair of toothed disks 79 carried by a shaft 80. Said toothed disks, shafts, and rolls are rotated in the directions indicated by the arrows (Fig. 4) by means of intermeshing gears 81 (Fig. 3), a sprocket 82 carried by one of them, and a chain 83 driven by a sprocket 84 carried by the shaft 64.

Each filler *b* that is fed from its hopper and deposited by the mechanism just described, arrives with its lower edge under an inclined strip 85 (Fig. 4). At the same time a box *a* is being brought to position by the pins of the chains 47, with the side margins of the box guided by vertical strips 86. The lower edge of the filler *b* is arrested by the coaction of the strip 85 and the margin of the box *a*, with the rear edge of the filler still in engagement with the teeth of the disks 79, so that said teeth will push the filler edgewise and then carry it down flat upon the upper surface of the box in the relative positions illustrated by Figure 7.

As the mechanism which effects temporary stoppage of the movement of the chains 47 while a filler *b* is being deposited upon a box *a* is illustrated and described in the Patent 1,717,696 hereinbefore referred to, and is not claimed herein, detailed reference thereto herein is unnecessary.

Having now described our invention, we claim:

1. In a machine of the character described, a hopper for a pile of the articles, means for feeding the articles singly from the bottom of the pile, and means for temporarily and substantially lifting an edge portion of the article next to the bottom one during the advance of the bottom one to prevent feeding of more than a single article at one time.

2. In a machine of the character described, a hopper for a pile of the articles, means for feeding the articles singly from the bottom of the pile, a rock shaft having arms extending under the rear of the pile, and means for actuating said shaft to cause the tips of the arms to substantially lift the rear edge of the article next to the bottom one after the start of the feed of the bottom article.

3. In a machine of the character described, a hopper for a pile of the articles, means for ejecting the articles singly from the bottom of the pile, and means for positively pressing each article down after it leaves

the hopper, said pressing means including a rotary toothed disk in position to engage and act on the rear edge of said article and press it down.

4. In a machine of the character described, a hopper for a pile of articles, means for ejecting the articles singly from the bottom of the pile, means for determining the limit to which said bottom article is ejected from the hopper, and rotary toothed disks in position to engage the rear edge of the ejected article and press it down.

In testimony whereof we have affixed our signatures.

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