July 2, 1946. R. J. WILLIAMS ET AL 2,403,149

BAG FILLING APPARATUS

Filed Nov. 15, 1943

FIG. 1.

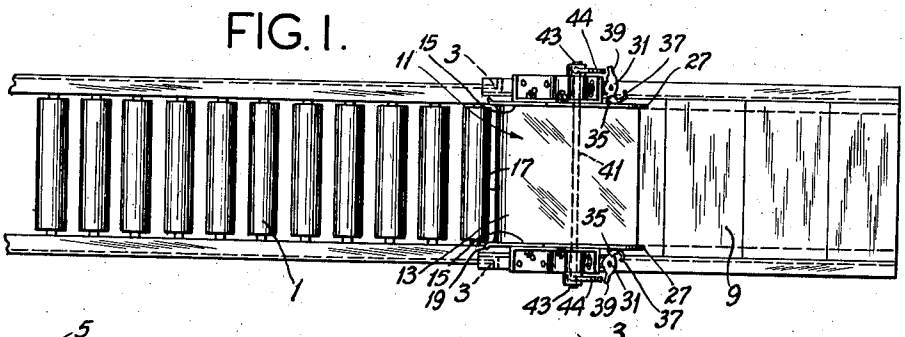


FIG. 2.

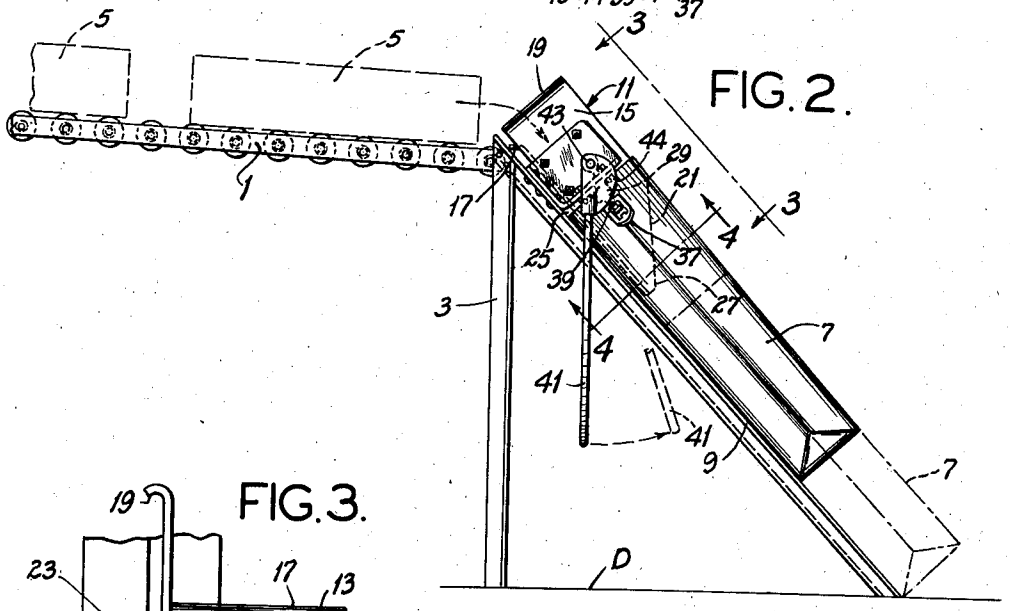


FIG. 3.

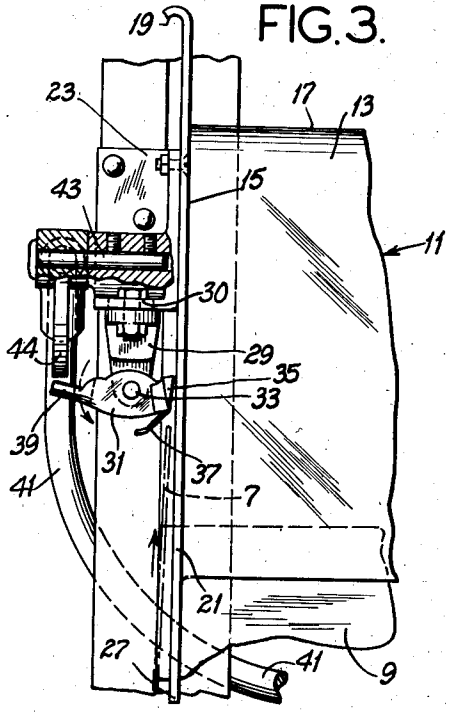
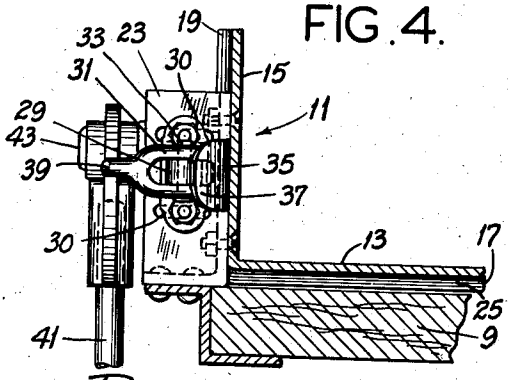


FIG. 4.



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BAG FILLING APPARATUS

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Application November 15, 1943, Serial No. 510,262

1 Claim. (Cl. 226—18)

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This invention relates to bag filling apparatus, and with regard to certain more specific features, to filling chutes for filling bags with solid slabs of material, boxes, cartons and the like.

Among the several objects of the invention may be noted the provision of convenient means for mounting and holding open bags in position to receive articles which it is desired to package; and the provision of apparatus of the class described which will conveniently release the bags for removal and closure. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claim.

In the accompanying drawing, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a plan view on a reduced scale showing our chute applied to the end of a gravity roller conveyor;

Fig. 2 is a side elevation of Fig. 1 on a larger scale; and,

Figs. 3 and 4 are further enlarged detail sections taken respectively on lines 3—3 and 4—4 of Fig. 2.

Similar reference characters indicate corresponding parts throughout the several views of the drawing.

In filling paper bags and the like with closely fitting slabs of material such as synthetic rubber, there is usually considerable confusion on the part of the operator in producing a precisely rectangular bag mouth shape which will easily receive the slabs without requiring an undue size of bag, which would leave slack material around the article after packaging. Difficulty is also encountered in slowly enough gravitating the slabs to the bag bottoms without damaging the bags. The invention avoids these difficulties and speeds packaging operations.

Referring now more particularly to the drawing, there is shown at numeral 1 a gravity type roller conveyor, the lower end of which is on a support 3. Down this conveyor come slabs of material 5 (synthetic rubber slabs for example) which need to be packaged at high speed in bags such as indicated at 7 without damage to the bags. To provide for this we arrange an operatively fixed sloping slide platform 9 located at about a 45 to 60 degree angle to the datum D.

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At 11 is shown a right-angular trough-shaped guide member which has a flat bottom 13 and vertical side walls 15. The upper inlet end of the bottom 13 is curved as shown at 17 to provide a fulcrum for the oncoming slabs 5. The upper ends of the walls 15 are flared outward as shown at 19. The lower ends of these walls are tapered downward toward the bottom 13 as indicated at 21. The lower wedge ends 27 are not flared.

The bottom 13 is supported above the platform 9 by means of laterally located supports 23. This is done in such a way as to allow space 25 between the bottom 13 and said platform 9. Thus a partially opened bag may readily be applied to the lower wedge portions 27 on the walls 15. Then, as the bag is pushed up, its bottom wall is accommodated between the guide bottom 13 and the platform 9 while it is expanded into rectangular shape.

In order to hold a bag in the attained position above described which is shown by solid lines in Fig. 2, the lateral supports 23 are provided with forwardly directed lugs 29 on which pivot clutch dogs 31. The pivots are shown at 33. The lugs 29 are attached by laterally adjustable bolt-and-slot connections 30.

Each dog 31 carries on its inner end (toward the adjacent wall 15) a wedge-shaped clutching segment 35, having a bag-guiding tail piece 37. On the other end each dog carries a release finger 39. Clockwise rotation of the dog shown in Fig. 3 causes contact between its clutch member 35 and the adjacent side wall 15. Counter-clockwise rotation separates said contact. Motion of the bag upward over the walls 15 causes its mouth end to be guided by the tail piece 37 to a position in between the clutch member 35 and the wall 15. The direction of the bag motion for such action is shown by the arrow in Fig. 3 in connection with the dotted-line showing of the bag wall. Reverse motion of the bag tends automatically frictionally to close the clutch 35. Thus a bag, when once applied, is held in position against axial force applied to it by an entering article which seats against its bottom.

To rotate the dog 31 to release position a bail 41 is pivoted behind and above the dogs as indicated at 43. The bail has two collinear pivots on opposite sides of the guide or chute 11 and loops under the platform 9. At its upper end it carries cams 44, which, when the bail is swung forward to the dotted line position shown in Fig. 2, will contact the fingers 39 to move the dogs 31 to release positions. The bale is easily reached for movement by an operator working near the

platform 9. The lugs 29 being adjustable on the bracket 23 by the slot and bolt combination 30 allow for taking up any wear of the clutch 35 and also allow for initial adjustments for variations in bag wall thicknesses.

After a bag has been slipped up into position, as shown in solid lines in Fig. 2, an oncoming slab 5 is tilted onto the fulcrum 17 and slides down between the guide wall 15 into the bag and against its bottom. The slope of the apparatus is arranged so that the velocity of the slab is low enough to avoid damage to the bag bottom (and to avoid tearing at the clutches 35). This action seats the slab (or bundle of slabs) in the bag and shapes the bag automatically, its mouth having already been properly shaped by the chute. Next, the operator pulls forward the bale 41, causing the clutches 35 to release, whereupon the filled bag slides down under frictional control to the dotted line position shown in Fig. 2. From this position it may be tilted upward for closing and removal.

Advantages of the invention are a convenient means for bringing a bag mouth up over the chute, whereupon the bag is automatically opened into proper slab-receiving, rectangular shape of the mouth, and wherein it is automatically held until conveniently filled simply by tilting an article and allowing it to slide down under control. It will be noted that the slab does not fall freely by gravity, the sloping chute having some friction which allows the slab to descend into the bag at a speed which is slow enough to prevent bag damage but fast enough to effect a proper seat on the bottom of the bag. Furthermore, the filled bag does not drop freely by gravity but is frictionally retarded in its descent over the platform 9. The convenient rotation of the bag into vertical position after its descent is also an advantage. In addition, the ball is quite easily reached for release of the filled bag.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

We claim:

Bag filling apparatus comprising an operatively fixed slide platform sloping up from a datum toward an article-receiving point, an operatively fixed chute mounted on said platform near its upper end and comprising a bottom spaced over and substantially parallel to the platform to accommodate between it and the platform one side of a bag, side walls on the chute tapered at their lower ends to function as spreaders for a bag mouth, the bottom of which mouth is placed on the platform and moved up under the chute bottom while the sides of the mouth become placed flatwise outside of said side walls and the top of the mouth spans between said walls, friction clutch means at the outsides of said walls and biased thereto, both of said clutch means when biased freely admitting said mouth sides but preventing retraction of the bag when loaded, being thereby operable automatically to hold a bag applied to the chute from the bottom, and manual means for simultaneously overcoming the biases of the clutch means for simultaneously releasing both of said automatic clutch means at the will of an operator.

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