June 28, 1927.

1,634,078

M. McFAULL ET AL

CARTON HANDLING APPARATUS

Filed Aug. 22, 1924

2 Sheets-Sheet 1

Fig. 1.

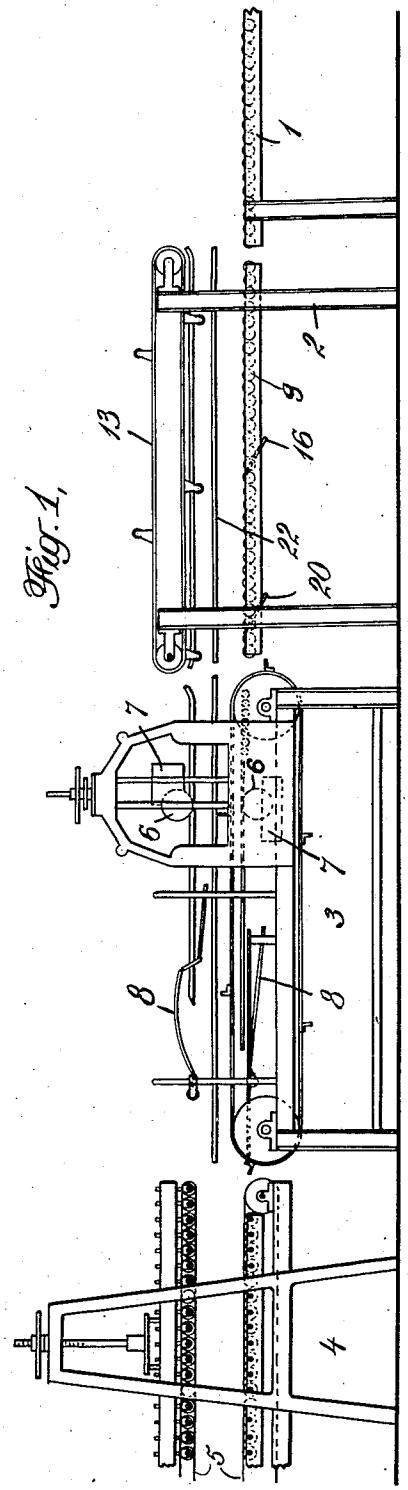
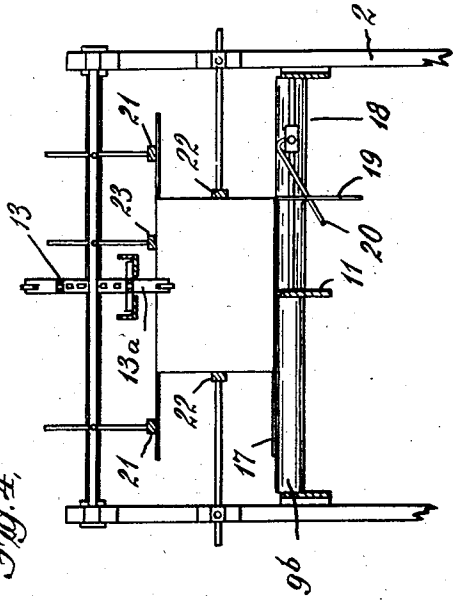


Fig. 4.



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Fig. 2.

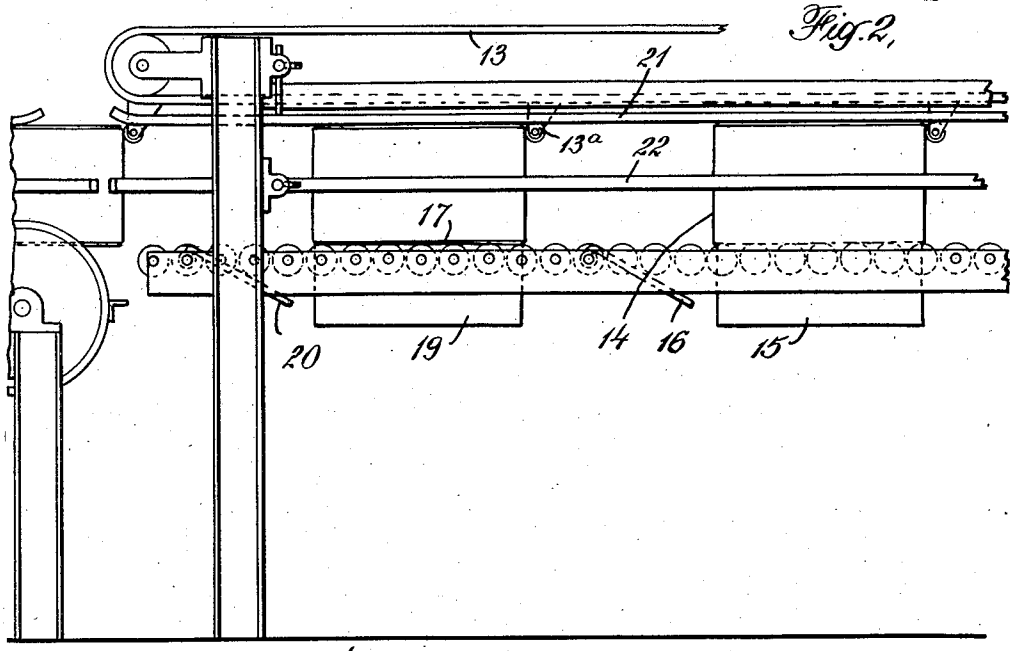
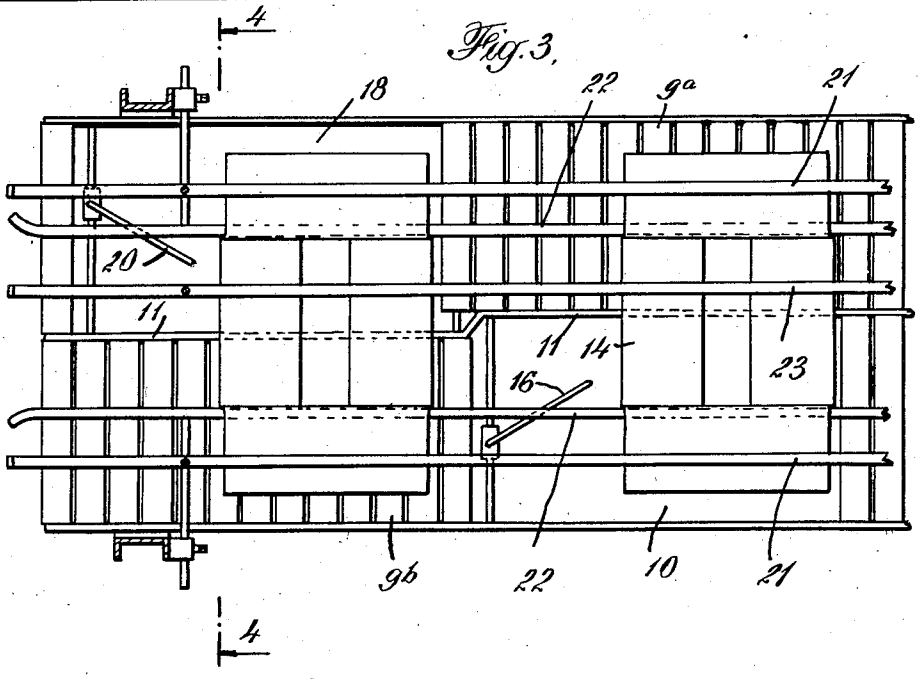


Fig. 3.



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UNITED STATES PATENT OFFICE.

MALCOLM McFAULL AND ARTHUR E. RIDEOUT, OF NEW YORK, N. Y., ASSIGNORS TO STANDARD SEALING EQUIPMENT CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CARTON-HANDLING APPARATUS.

Application filed August 22, 1924. Serial No. 733,510.

The present invention relates to apparatus for handling cartons in order to facilitate sealing of the cartons for shipment. It has to do particularly with the handling of filled cartons to bring them into condition for application of silicate or other sealing material by means of which the carton is to be sealed.

Cartons made of fibre board or the like of the type commonly used at the present time in the shipment of packaged goods are commonly sealed with a suitable cement, such as for instance silicate of soda. The carton blanks as supplied to the trade consist of a four-sided body part designed to ultimately constitute the four side walls of the sealed carton, together with four portions or flaps at each end depending from the body part. The depending portions at each end, constitute two inner flaps and two outer flaps to be folded over the inner flaps at right angles to them to ultimately constitute the ends of the sealed carton. For shipment, the flaps at both ends of the carton must be sealed. This is sometimes done by sealing the flaps constituting one end of the carton before the carton is packed. The empty cartons having their bottom closures formed are then packed for shipment after which the top flaps of the carton are sealed. For commercial reasons, however, it is preferable to seal both the bottom and the top flaps of the cartons after the cartons have been packed, and this is at present common practice.

The cartons are commonly packed at a point remote from the apparatus used in the sealing operation. The bottom flaps of the blanks are folded to constitute a closure at the bottom of the carton, whereupon the carton is filled and is then transported to the carton sealing apparatus. The problem of transporting the cartons to the sealing apparatus, unfolding both the top and bottom flaps, applying silicate to the flaps and then closing and sealing the flaps is a source of considerable difficulty in connection with the handling of carton packed goods. A particular difficulty arises in the handling of the filled carton to perform the necessary sealing operations without disarranging or otherwise disturbing the packages contained in the carton.

In case the gumming of the carton flaps is accomplished manually, the operator unfolds the top flaps, silicates the undersides of the outer top flaps and then closes the outer flaps upon the inner flaps into the position which they will occupy in the sealed carton. He then inverts the filled carton, being careful not to disturb its contents. With the carton then resting upon its freshly gummed flaps the operator silicates the flaps which are now at the upper end of the carton and folds them down into closed position, after which he introduces the carton into a suitable pressure applying unit where it is permitted to remain until the silicate on the flaps has set. In case automatic mechanism is employed to apply the silicate to the carton flaps, the carton must ordinarily be introduced into the silicate applying apparatus with its outer top and bottom flaps laterally extended. The operator receives the carton as it comes from the packing operation, folds out the outer top flaps, and then inverts the carton without disturbing its contents in order that he may fold out the flaps at the other end of the carton into condition for introduction into the silicate applying apparatus. The operation of inverting the filled cartons involves considerable manual labor and at the same time necessitates much care if the operation is to be performed without disturbing the contents of the package.

It is a principal object of this invention to provide an apparatus for receiving the unsealed cartons after they have been packed and facilitating the unfolding of the flaps for introduction into the silicating mechanism without necessity for inverting or otherwise manipulating the filled carton. Thus the cartons may be packed at a point distant from the sealing apparatus and conveyed to the sealing apparatus on any suitable conveyer, at which point the operator need merely fold out the outer top flaps and permit the carton to pass along directly into the silicating and sealing apparatus. The operator is capable of handling the cartons and passing them on with great rapidity with the result that a greatly decreased amount of time is required for handling the cartons preparatory to the silicating and sealing of the flaps.

It is also an object of the present invention to provide an apparatus for receiving

the packed unsealed cartons with their bottom flaps closed and unfolding the outer bottom flaps while the carton is passing continuously thru the apparatus. The unfolding of the outer bottom flaps is accomplished without the use of mechanism which must be inserted under the closed flaps. For this reason all likelihood of tearing or otherwise injuring the flaps is avoided.

We have illustrated a preferred embodiment of our invention in the accompanying drawings in which Figure 1 is an elevational view, somewhat diagrammatic, illustrating the apparatus embodying our invention thru which the unsealed filled carton is passed before it is ready for shipment;

Figure 2 is an elevational view illustrating our improved apparatus for unfolding the outer bottom flaps;

Figure 3 is a plan view of the apparatus shown in Figure 2; and

Figure 4 is a transverse sectional view taken on line 4—4 of Figure 3.

Referring to Figure 1 of the drawings, 1 indicates the conveyer upon which the filled unsealed cartons are transported from the place at which they are packed to the carton sealing apparatus. The frame work or supporting structure indicated at 2 serves to support the apparatus which receives the carton from the conveyor 1 and serves to unfold and laterally extend the outer bottom flaps. The cartons with their flaps thus extended are then passed into the apparatus indicated generally at 3 which serves the function of silicating the flaps and folding them into closed position. The closed and silicated cartons then pass along into the pressure unit 4 in which the gummed flaps are subjected to pressure by means of presser belts 5 which engage the flaps along their fold lines. The silicating of the flaps is accomplished thru the medium of feed rolls 6 which withdraw the liquid silicate from the reservoirs 7 and apply it to the carton flaps as the cartons pass thru the apparatus. Further movement of the cartons brings the flaps into engagement with the closing members 8 which serve to close both the upper and lower flaps and put the carton into condition for introduction into the pressure unit 4. Any conventional type of silicate applying means and flap closing means may be employed. The unit here shown is similar to that disclosed in the copending application of Wallace D. Kimball, Arthur E. Rideout and Malcolm McFaull for Carton sealing apparatus filed concurrently herewith. No claim is made in the present application to the specific construction of the apparatus for silicating and sealing the carton flaps.

The apparatus for unfolding and extending the bottom flaps of the carton comprises a roller table or other suitable support in alignment with the conveyor 1. This table preferably consists of two roller table sections 9^a and 9^b. Near the initial end of the roller table section 9^b a gap 10 occurs. At this point the dividing partition 11 between the table sections 9^a and 9^b is offset slightly toward the side adjacent the section 9^a. The carton is held positioned centrally of the table thru the medium of suitable side guides 22, the carton being driven by an endless chain 13, having upon it suitable downward projections 13^a adapted to engage with the rear edge of the carton and thus propel the carton thru the apparatus. Upon movement of the carton over the whole or gap 10 into the position indicated at 14, the lower bottom flap 15 of the carton will drop down under its own weight into substantially vertical position as shown, the offset partition 11 affording ample clearance for the carton flap to thus swing downwardly. As the carton proceeds thru the apparatus the downwardly extending flap 15 is engaged by a guide arm 16 which turns the flap 15 up into horizontal position extending out laterally at the side of the carton as indicated at 17.

A gap 18 is provided in the table section 9^a at a point beyond the gap 10. At this point the middle partition 11 is offset in the opposite direction to furnish ample clearance so that the other outer bottom carton flap 19 may swing down into vertical position as shown. Further movement of the carton brings the downwardly extending flap 19 into engagement with a guide arm 20 which moves the flap up into horizontal position extending out at the side of the carton. The carton is then in condition for introduction into the sealing and flap closing unit 3.

Upon passing of the carton onto the supporting table 9 the operator folds out the outer top flaps so that they are maintained in laterally extended relation under the action of guide bars 21 extending along the length of the apparatus. A guide 23 is also preferably provided for the purpose of holding down the inner top flaps, while the side guides 22 serve to properly center the carton with respect to the supporting table 5 and at the same time furnish the necessary lateral support to maintain the carton upright when it passes over the gaps 10 and 18 in the roller tables. Since slightly more than half of the carton overhangs the edge of the table, during the time it is passing the gaps 10 and 18, there will be a slight tendency for the carton to overturn, but this tendency is immediately checked by the side guides 22.

The invention therefore contemplates an apparatus for receiving filled unsealed cartons and providing for the opening of the outer bottom flaps under the influence of their own weight and the turning of the

flaps up into laterally extended position for introduction into the silicate applying mechanism. This operation of folding out the outer bottom flaps is accomplished while the carton is in continuous movement thru the apparatus. It is accomplished without necessity of inverting or otherwise disturbing the carton with the consequent danger of damaging or disarranging the contents of the carton, and without danger of injury to the carton flaps. No attention or manual effort is required in thus folding out the bottom flaps to receive the silicate.

We claim:—

Carton handling apparatus of the class described comprising a support for filled unsealed cartons including conveyer rolls arranged in two parallel longitudinally extending sections, each of said sections being discontinued at different points lengthwise of the support, a dividing member extending longitudinally between said roll sections and offset laterally at said respective discontinuities so that the widthwise extent of said supporting sections falls short of the center opposite said discontinuities, and means for moving the carton along said support centrally positioned with respect to the width of the support, whereby upon passage of a carton over said discontinuities the outer bottom flaps of said cartons are permitted to swing into open position.

In testimony whereof we affix our signatures.

ARTHUR E. RIDEOUT.
MALCOLM McFAULL.