May 5, 1942. J. R. WYSONG 2,282,278

PACKAGE CONVEYING, CLOSING, AND SEALING MACHINE

Filed Dec. 13, 1938 2 Sheets-Sheet 1

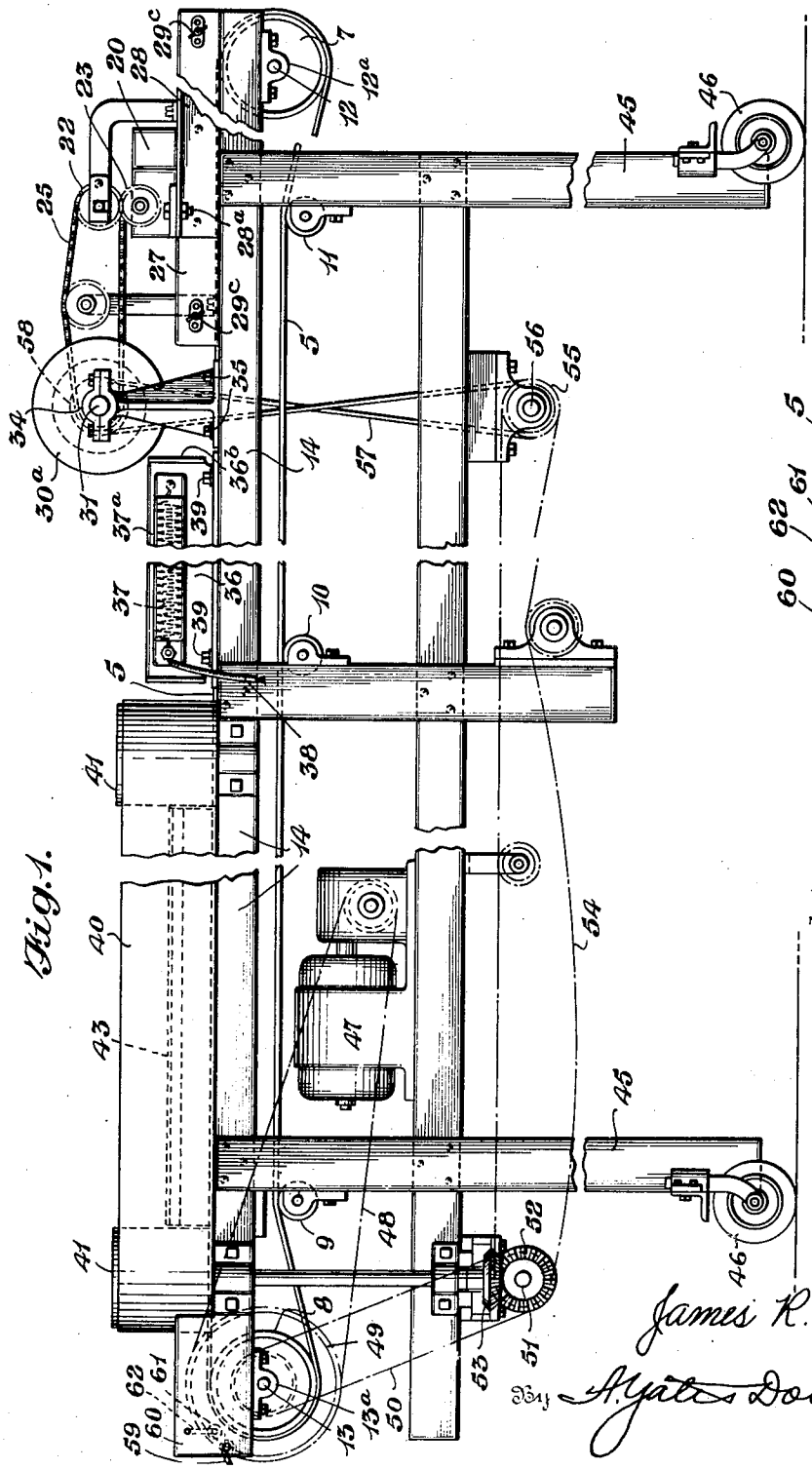


Fig. 1.

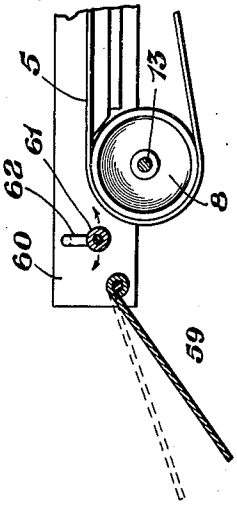


Fig. 5.

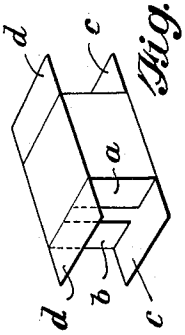


Fig. 6.

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PACKAGE CONVEYING, CLOSING, AND SEALING MACHINE

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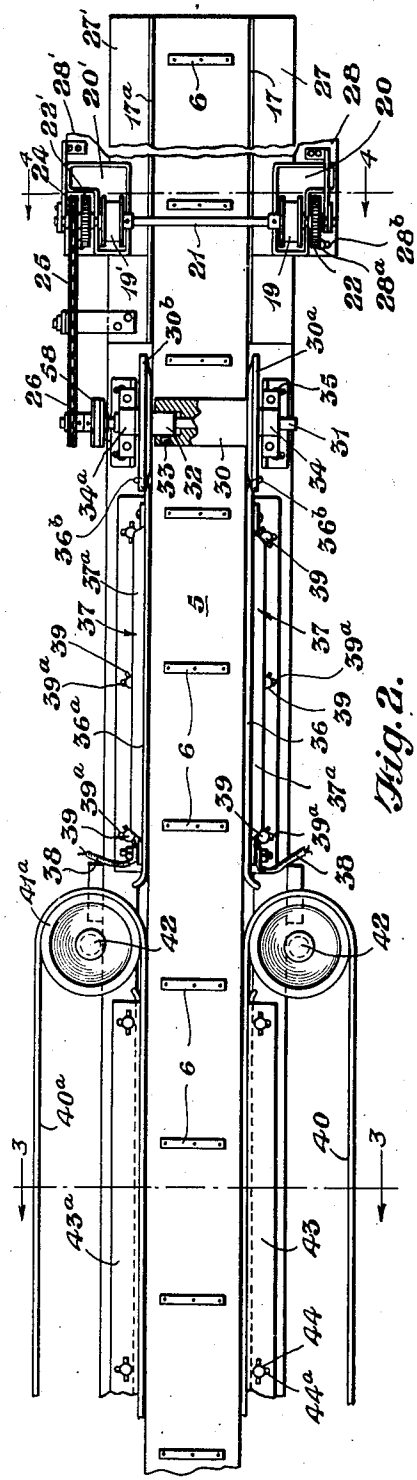


Fig. 2.

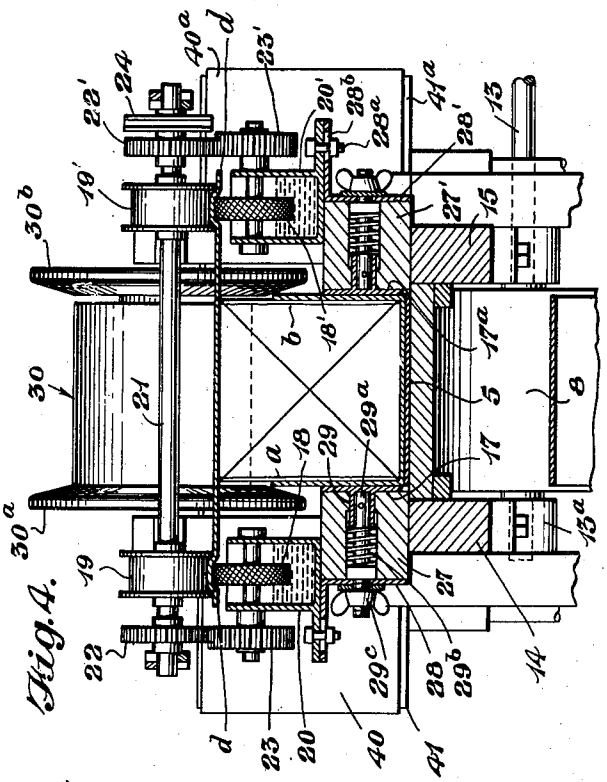


Fig. 4.

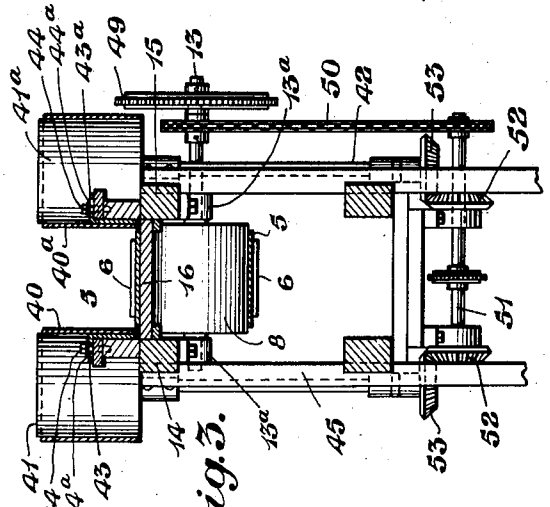


Fig. 5.

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Patented May 5, 1942

2,282,278

UNITED STATES PATENT OFFICE

2,282,278

PACKAGE CONVEYING, CLOSING, AND SEALING MACHINE

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Application December 13, 1938, Serial No. 245,530

5 Claims. (Cl. 93—6)

This invention relates to package conveying closing and sealing machines, and may be considered in the nature of an improvement over the machine disclosed in my prior Patent No. 1,763,493.

The type of machine with which the present invention is concerned performs the functions of conveying loaded cartons from a packaging machine, for example, to a suitable point of deposit or transfer and simultaneously effects closing and sealing of the sealing flaps of the cartons. The machine is used in the present instance in a tobacco factory for conveying, closing and sealing cartons containing individual packages of tobacco.

An object of the present invention is to provide a machine of the type specified which is of relatively simple construction and which at the same time is more flexible in its use than prior known machines for performing similar functions. More specifically, the invention contemplates a package conveying, closing and sealing machine in which the various operating members which effect closing and sealing of the carton are so constructed and arranged as to permit a limited amount of adjustment in accordance with varying sizes of cartons, and in conjunction with this feature, means rendering the machine portable whereby it may be used at will at different places and in operative relation with packaging machines or the like handling different sizes of cartons; improved means for effecting sealing of the sealing flaps after having the adhesive applied thereto; improved means for effecting discharge of the cartons; and other features of novelty and advantage which will become more apparent in view of the following description taken in conjunction with the drawings, wherein:

Fig. 1 is a view in broken side elevation of a machine constructed in accordance with the features of the present invention;

Fig. 2 is a top plan view thereof;

Figs. 3 and 4 are enlarged transverse sectional views;

Fig. 5 is a longitudinal section taken through the rear extremity of the conveyor, particularly showing the means for effecting discharge of the sealed cartons; and,

Fig. 6 is a perspective view of one of the cartons handled by the machine.

The packages to be sealed move into the machine from the right hand end of the latter as viewed in Figs. 1 and 2. The packages or cartons for which the machine is adapted are of that type having flaps *a*, *b*, *c* and *d* at opposite ends of the carton (note Fig. 6), the flaps *a* and *b* being first folded inwardly and the flap *c* then overlying these infolded flaps and being partially overlapped by the sealing flap *d*. In the present machine, the flaps *a*, *b* and *c* are folded before the carton or box enters the machine, leaving the sealing flaps *d* projecting laterally (note Fig. 4) to be moistened with an adhesive, folded down and sealed as the carton is conveyed through the machine.

The machine comprises a conveyor consisting of a belt 5 of flexible material having thereon spaced cleats 6 adapted to engage cartons placed on the conveyor. The conveyor belt 5 is trained over pulleys 7 and 8 located at opposite ends of the machine, the belt being kept under suitable tension by adjustable tension pulleys 9, 10 and 11 which engage the lower stretch of the belt.

The pulleys 7 and 8 are mounted on shafts 12 and 13 which are rotatably supported in bearings 12*a*, 13*a*, connected to longitudinally extending side frame members 14 and 15, which are cross connected by frame member 16 forming a supporting base for the upper stretch of the belt 5 (note Fig. 3).

Boxes or cartons disposed on the belt 6 at the right hand end of the machine pass into a runway defined by the belt 5 and side members 17 and 17*a* with the flaps *d* at opposite ends of the box overlying the side members and guided through adhesive-applying rolls 18—18' and coacting pressure rolls 19—19'. The rolls 18—18' run in glue pots or analogous containers 20 and 20' having therein a suitable adhesive. The rolls 19—19' are adjustably mounted on a shaft 21 having gears 22—22' secured on the ends thereof and meshing with gears 23—23' having a driving connection with the rolls 18—18'. On the one end of the shaft 21 is a sprocket 24 having trained thereon sprocket chain 25 which is driven from sprocket 26, as will subsequently appear.

The rolls 18, 18' have their active surfaces knurled or otherwise roughened to more readily take up the adhesive.

The rolls 18—18' together with the glue pots 20—20' are supported for lateral adjustment on frame members or blocks 27—27' and flanged plates 28—28', each glue pot being adjustably secured on the flange of its supporting plate by means of bolts 28*a* passing through slotted openings 28*b*. Plates 17 and 17*a* each has secured thereto sleeve 29 in which thread bolt 29*a* projects and has thereon spring 29*b*, the latter abutting against said sleeve and exerting an inward

thrust on the plate to which the sleeve is attached. Stud bolt 29a projects through plate 28 (or 28') and at its inner end is secured in said sleeve 29. A wing nut 29c is threaded on the outer end of stud or bolt 29a, and by adjusting this nut, plates 17 and 17a may be adjusted laterally toward and from one another. In the position shown, they are adjusted to full-width runway. By this means, the width of the runway is adjustable to accommodate varying sizes of boxes or cartons. With the type of carton being handled, this adjustment need only be within a relatively small range, although it may obviously be as great as is necessary. Gears 23, 23' are of a width to accommodate a reasonable range of adjustment of the glue pot assemblies associated therewith.

After the adhesive has been applied to the sealing flaps *d* of the cartons, the latter are advanced to a folding spool or roller generally indicated at 30 and having folding flanges 30a, 30b, each of which is preferably formed with an outwardly beveled contour or folding surface and whereby the flaps are more effectively guided between the said folding flanges 30a, 30b, note particularly Figs. 2 and 4. The spool is mounted on a shaft 31, and the arrangement is such that the folding flanges 30a, 30b of the spool may be adjusted laterally to accommodate varying lengths of cartons. With this in view, the flange 30b is provided with a bearing hub 32 which telescopes into the main hub of the spool, and the main hub is adjustably secured on hub 32 as indicated at 33. Both folding flanges 30a and 30b are supported in bearings 34 and 34a which are adjustably secured on the frame members of the machine through the medium of bolts 35 passed through slotted openings therefor. By loosening the bolts 35, the bearing assembly for the flanges 30a, 30b together with the latter may be adjusted to space the flanges the proper distance apart.

After the sealing flaps *d* have been folded by the flanges 30a, 30b and the spool 30, they are engaged by side members 36, 36a each in the form of an elongated shoe having an outturned end 36b serving to guide the box or carton therebetween; and in connection with these members 36, 36a heating means 37 is provided in the form of a unit or housing 37a secured to the outer side of the members 36, 36a. In the present instance, the heat is obtained through the medium of an electric coil or resistance unit supplied with current through conductors 38 extending to a suitable source of electric power. The heating and setting members 36, 36a together with their heating units 37 are adjustably supported on the frame of the machine through the medium of bolts 39 extending through slotted openings 39a and whereby these members may also be adjusted in accordance with the adjustment of the units previously described and also in accordance with the dimensions of the carton passing therebetween.

From the heating units 36, 36a, the boxes advance into a U-shaped runway defined by bottom belt conveyor 5 and side belts 40 and 40a trained over pulleys 41, 41a mounted on vertically extending shafts 42. The belts 40, 40a are backed up by side members 43, 43a which are adjustably mounted on the frame of the machine as by means of bolts 44 passing through slotted openings 44a. These side members serve to hold the sealing flaps closed while the adhesive finally sets.

The entire machine is portable and accordingly is supported on legs 45 provided with rollers or wheels 46. In this manner the machine as a whole may be moved in any place where its services may be desired. This feature is of considerable importance where one machine is to serve a number of packaging machines, and in conjunction with this feature of portability, it is of prime importance that the spacing of the various sealing instrumentalities be adjustable to conform to different sized cartons since certain of the packaging machines may be handling cartons of varying dimensions.

The machine may be driven through the medium of motor 47, drive chain 48, sprocket 49, the latter connecting through sprocket chain 50 with sprocket gear secured on shaft 51. Shaft 51 has secured on the opposite ends thereof beveled gears 52, which mesh with coacting beveled gears 53 secured on vertically projecting shafts 42 to which the pulleys 41, 41a for driving the side belts 40, 40a are secured. Also from the shaft 51 the drive is taken to sprocket chain 54, thence to pulley 55 mounted on shaft 56, and from this latter pulley through belt 57 to pulley 58 secured on shaft 31.

A discharge chute or tail board 59 is pivotally mounted on side members 60 at the rear extremity of the machine, and to ensure a smooth uninterrupted transfer of the cartons from the rear end of the conveyor 5 to the said chute, a member in the form of a roller 61 is suspended from brackets 62 pivotally mounted in the side members 60. Thus, as each carton reaches the rear end of the belt 5, it moves on to the roller 61 and a succeeding box or carton abutting the carton on the roller causes the latter to swing rearwardly and upwardly onto the chute or tail board 59. The board 59 may be propped on a table or other member adapted to receive the cartons, and due to its pivoted action, is adaptable to varying heights. By this means, the boxes or cartons are prevented from blocking free discharge of the conveyor.

In operation, assuming the machine is to be fed manually, an atttendant takes a carton with the flaps *a*, *b* and *c* already folded and disposes it in the runway at the right hand end of the machine with the flaps *d* extending laterally. As the carton advances the flaps *d* pass between the adhesive-applying rolls 18 and 19, at which point an adhesive is applied to the under side of each flap. As the cartons are advanced further along the runway, the flaps *d* are engaged by the folding flanges 30a, 30b of the folding spool 30 and folded inwardly onto the flaps *c*. From this point the cartons advance between the heating units 36, 36a where the flaps are set, the heat applied through the units 37 being adjusted to obtain the most effective setting operation. The cartons then advance between the belts 40 and 40a, where the flaps become finally set and sealed, after which the cartons are discharged onto swinging roller 61 and chute or tail board 59.

The machine is capable of handling a large quantity of boxes or cartons expeditiously with a sure and effective flap folding and sealing action, and due to the particular construction and arrangement of parts, the conveyor runway is adaptable to a range of different sized cartons. Furthermore, the machine is relatively simple in construction and economical in operation.

It will be understood that advantages other than those enumerated herein are inherent in

the improved machine, and that in obtaining these advantages the machine may be varied in construction and design within certain limits without departing from the spirit or scope of the invention as defined by the appended claims.

What is claimed is:

1. In a machine for conveying, closing and sealing cartons, a conveyor, means defining in conjunction with the conveyor a runway for the cartons, means for sealing the flaps of the cartons while being conveyed, and means at the discharge extremity of the conveyor adapted to receive the cartons from the conveyor, said receiving means including a bodily movable and rotatable member on which each carton is deposited by the conveyor and propelled thereover through contact with succeeding cartons.

2. In a machine for conveying, closing and sealing cartons, a conveyor, means defining in conjunction with the conveyor a runway for the cartons, means for applying an adhesive to certain flaps of the cartons, means for sealing said flaps while the cartons are being conveyed, a chute or tail board pivotally mounted at the discharge end of the conveyor in spaced relation to the latter, and a transfer member swingably mounted in said space and adapted to receive the cartons from the conveyor and transfer them to the tail board.

3. In a machine for conveying, closing and sealing cartons, a conveyor, means defining in conjunction with the conveyor a runway for the cartons, means for applying an adhesive to certain flaps of the carton, means for sealing said flaps while the cartons are being conveyed, a chute or tail board pivotally mounted at the discharge end of the conveyor in spaced relation to the latter, a roller positioned between the pivoted end of the tail board and the discharge end of the conveyor to receive the cartons from the conveyor and effect transfer of the cartons to the tail board, and means swingably mounting said roller.

4. A carton sealer comprising an elongated supporting frame structure, a main cleated conveyor extending substantially the entire length of the machine for conveying cartons therethrough, means at the entrance extremity of the machine for applying an adhesive to the sealing flaps of the cartons including upper and lower rollers providing therebetween a pass for the flaps to be sealed, a rotatable folding member located beyond said adhesive applying means and driven in synchronism with said rollers for folding said flaps, side shoes beyond said folding member for applying pressure to the sealing flaps while the carton is being conveyed to facilitate setting of the flaps, heating means associated with said shoes, side conveyors of less length than the main conveyor located beyond said pressure applying and heating means, said side conveyors having opposed upright runs adjacent the opposite sides of the main conveyor to hold the sealing flaps closed while the adhesive sets, and means for driving said main and side conveyors in unison.

5. A carton sealing machine comprising an elongated supporting frame structure, a main conveyor extending substantially the entire length of the machine for conveying cartons therethrough, means at the entrance of the conveyor for applying an adhesive to the sealing flaps of the cartons including upper and lower rollers providing therebetween a pass for the flaps to be sealed, a rotatable folding member located beyond said adhesive applying means for folding said flaps, side shoes beyond said folding member for applying pressure to the sealing flaps while the carton is being conveyed to facilitate setting of the flaps, heating means associated with said shoes, side conveyors of less length than the main conveyor located beyond said pressure applying and heating means, said side conveyors having opposed upright runs adjacent the opposite sides of the main conveyor to hold the sealing flaps closed while the adhesive sets, and means for advancing said main and side conveyors in unison.

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