

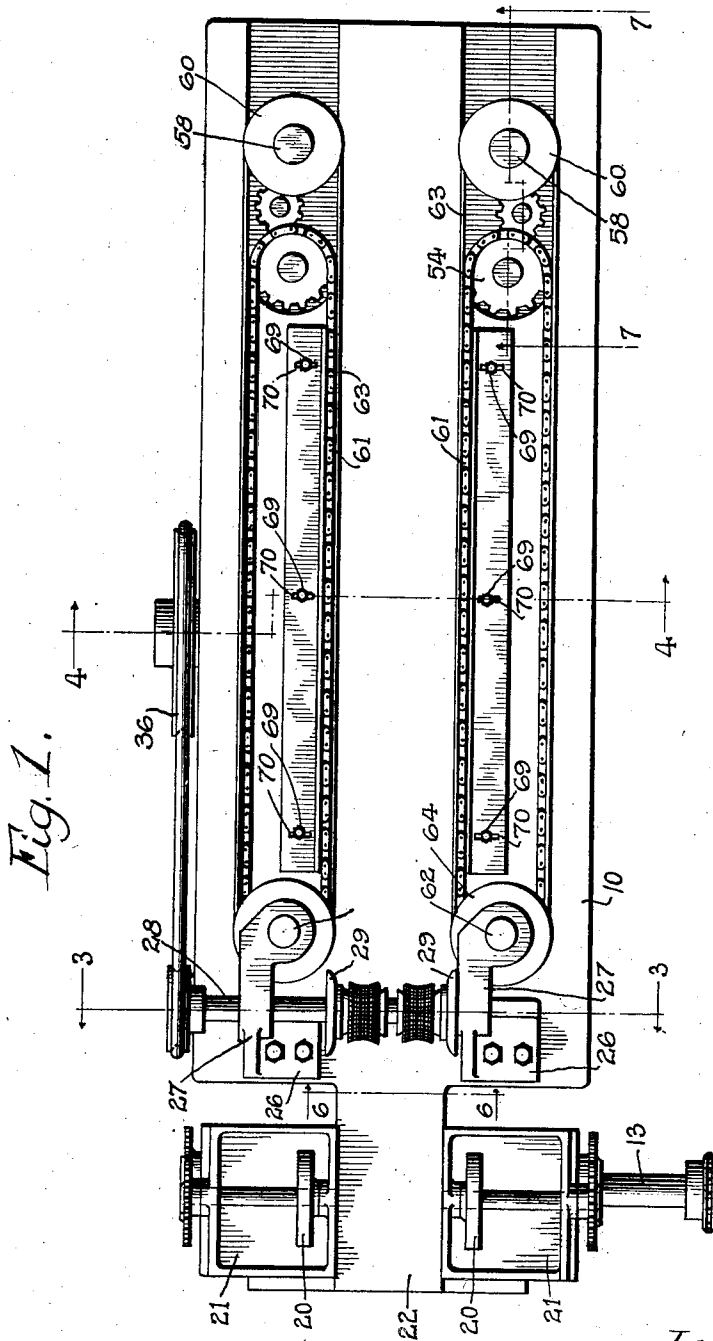
July 31, 1923.

M. J. MILMOE
CARTON SEALING MECHANISM

1,463,627

Filed Jan. 7, 1920

5 Sheets-Sheet 1



Inventor:
Michael J. Milmo
By Brown & Nissen Attys

July 31, 1923.

1,463,627

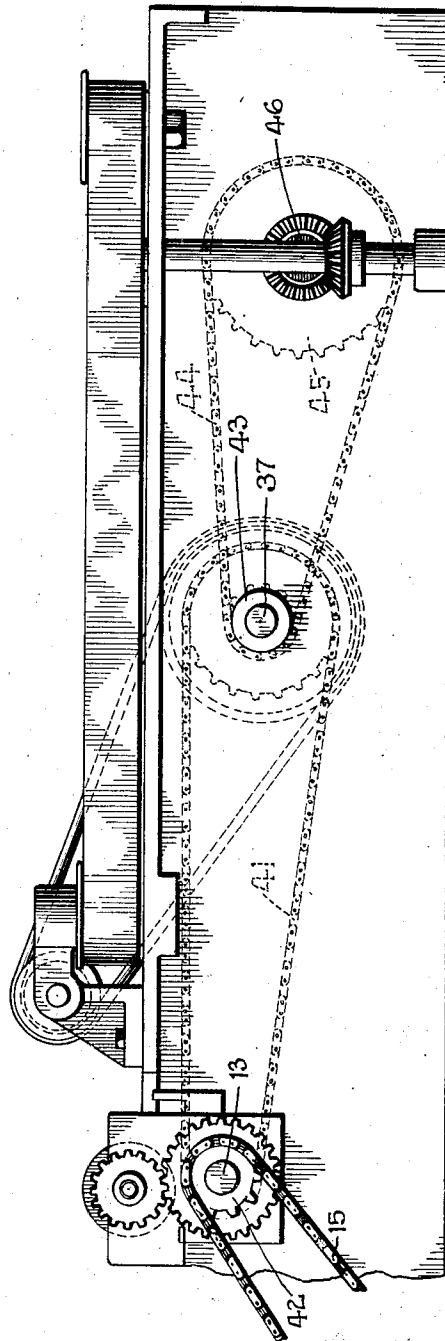
M. J. MILMOE

CARTON SEALING MECHANISM

Filed Jan. 7, 1920

5 Sheets-Sheet 2

Fig. 2



Inventor
Michael J. Milmo
By Brown & Tissen
MJS

July 31, 1923.

1,463,627

M. J. MILMOE

CARTON SEALING MECHANISM

Filed Jan. 7, 1920

5 Sheets-Sheet 3

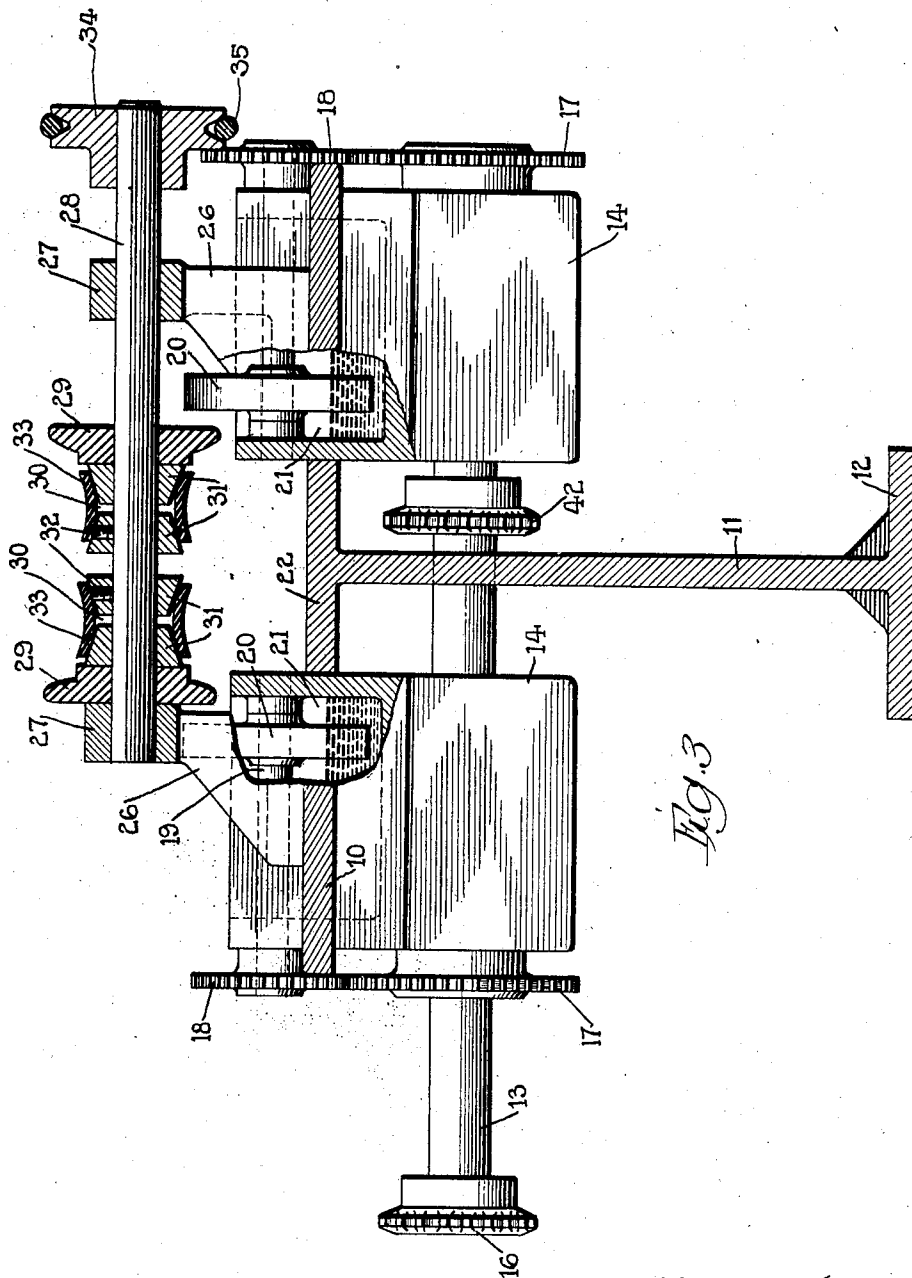


Fig. 3

Inventor
Michael J. Milmo
By Brown & Tissen.
Attys

July 31, 1923.

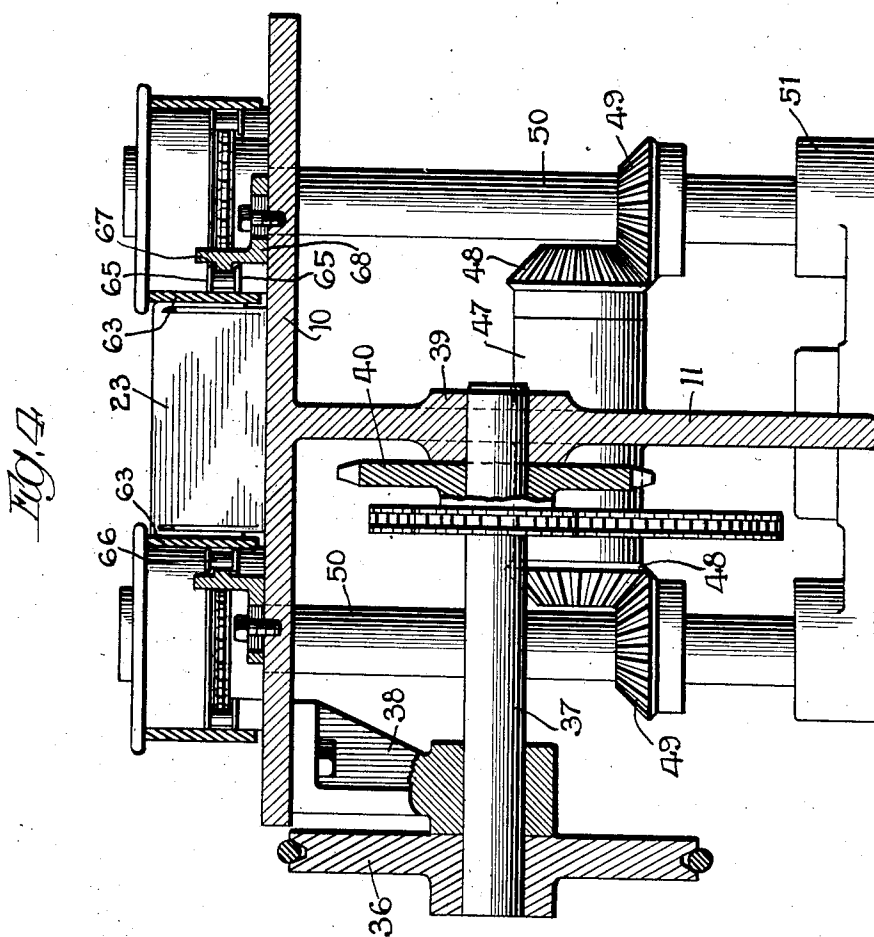
1,463,627

M. J. MILMOE

CARTON SEALING MECHANISM

Filed Jan. 7, 1920

5 Sheets-Sheet 4



Inventor
Michael J. Milmoel
By Brown & Nissen
Attys

UNITED STATES PATENT OFFICE.

MICHAEL J. MILMOE, OF CHICAGO, ILLINOIS, ASSIGNOR TO F. B. REDINGTON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CARTON-SEALING MECHANISM.

Application filed January 7, 1920. Serial No. 350,038.

To all whom it may concern:

Be it known that I, MICHAEL J. MILMOE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carton-Sealing Mechanism, of which the following is a specification.

This invention relates to mechanism for sealing cartons or similar devices and for holding parts of such devices in position for a period of time to permit of the setting of adhesive material for permanently securing the parts, and has for its object the provision of a device of the character named which shall be of improved construction and operation.

The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—

Fig. 1 is a top plan view of one embodiment of the present invention;

Fig. 2 is a side view of the mechanism shown in Fig. 1;

Fig. 3 is a vertical section substantially on line 3—3 of Fig. 1;

Fig. 4 is a vertical section substantially on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary sectional view showing an adhesive applying device;

Fig. 6 is a fragmentary elevation of a feeding and folding roller; and

Fig. 7 is a fragmentary vertical section on line 7—7 of Fig. 1.

In the embodiment of the invention illustrated in the drawings, a table 10 is supported on a vertical plate and web 11 having a foot-piece 12. A shaft 13 is journaled in bearings 14 supported beneath the table top at one end thereof and is driven by a sprocket chain 15 and sprocket wheel 16. The chain 15 is operated from the moving parts of a carton-filling machine or other device from which articles are supplied to the sealing mechanism comprised in the present invention. A pair of spur gears 17 are secured to the shaft 13 adjacent opposite sides of the table top 10, and each gear 17 meshes with a gear 18 carried on a shaft 19 to which is secured a glue roll 20. The

glue rolls 20 rotate in receptacles 21 in which adhesive material in a liquid or semi-liquid form is placed. The receptacles 21, as shown in Fig. 1, are supported at opposite sides of an extension 22 of the table top 10, the extension forming a slideway between the inner sides of the receptacles 21. In the embodiment of the invention shown in the drawings filled cartons 23 are fed onto the slideway 22 in any suitable manner, as from a filling machine, and are moved along the slideway 22 with their end flaps 24 in extended position and resting upon the upper periphery of the glue rolls 20. The inner flaps 25 of the cartons 23 are held in closed position by the inner side walls of the receptacles 21.

At the inner end of the slideway 22 a pair of brackets 26 are mounted upon the upper face of the table 10 and carry bearings 27 in which is journaled a horizontally extending transverse shaft 28. As shown in Fig. 3, a pair of discs 29 are secured to the shaft 28, and between the discs the shaft is provided with a pair of expansible feed rollers 30. The feed rollers 30 each comprises a pair of discs 31 which have conical-shaped peripheries, one of the discs of each pair being adjustable toward and from the other and held in adjusted positions by a set screw 32. A band 33 of elastic material, such as rubber, surrounds each feed roll 30 to provide a frictional surface. The diameter of the feed rolls may be adjusted by moving the discs 31 toward and away from one another. As a carton 23 is moved from between the glue rolls 20 beneath the feed rollers 30 the upper face of the carton will be engaged by the rolls 30 and the carton will be moved along over the upper face of the table top 10 by the frictional engagement between the rolls 30 and the surface of the carton. At the same time the flaps 24 will be engaged by the folding discs 29, as shown in Fig. 6, and will be folded into the position shown in that figure by the rotary movement of the discs and by the forward movement of the carton which draws the carton between the inclined faces of the discs.

At the same time that the flaps 24 are bent inwardly the frictional rollers 30 tend to move the upper face of the carton forwardly in advance of the lower face which rests

upon the table top 10. The rotation of the feed rolls 30 draws the upper portion of the carton forwardly, while the frictional contact between the table top 10 and the lower portion of the carton tends to retard the lower carton wall. The slight relative movement between the upper and lower walls of the carton thus provided is desirable for the purpose of squaring the carton at the time that the glued end flaps are moved into closed position, for the reason that the cartons coming from the filling machine are usually somewhat askew. The cartons are furnished folded flat and after they have been opened and filled they have a tendency to return toward their folded position and the movement imparted to the upper wall of the carton relative to the lower wall tends to correct this incomplete opening of the carton and to square the end flaps so that their ends register with the side walls of the carton.

The shaft 28 is driven by a pulley 34 secured to the end thereof and which is rotated by a belt 35, which in turn is driven by a pulley 36 on a cross shaft 37. The shaft 37, as shown best in Fig. 4, is mounted in a bearing bracket 38 secured to the lower face of the table 10 and a journal bearing 39 formed in the supporting web 11. The shaft 37 is rotated by a sprocket wheel 40 which is connected by a chain 41 to a sprocket wheel 42 on the shaft 13. A smaller sprocket wheel 43 on the shaft 37 drives a chain 44 which passes over a sprocket wheel 45 secured to a shaft 46 which is journaled in a bearing 47 carried by the supporting web 11 near the discharge end of the machine. The ends of the shaft 46 carry beveled gears 48 which mesh with beveled gears 49 on upright shafts 50. The shafts 50 are journaled in footstep bearings 51 connected with the base 12 for the web 11, and the upper ends of the shafts 50 are journaled in bearings formed in the table top 10, as shown in Fig. 7. Each shaft 50 carries a spur gear 52 on the upper end thereof which is mounted in a recess 53 formed in the upper face of the table top 10. A sprocket wheel 54 is secured to the end of each shaft 50 above the spur gear 52. Bolts 55 extend through the table top 10 and form stud shafts for idler pinions 56 which mesh with the gears 52. The idler pinions 56 drive gears 57 carried on stud shafts 58 secured to the table top 10 by nuts 59. The gears 57 are connected with pulley wheels 60 which rotate in unison with the gears 57 on the stud shafts 58. Sprocket chains 61 driven by the sprocket wheels 54 pass around sprocket wheels journaled loosely on upright shafts 62 carried by the brackets 27 adjacent the receiving end of the device. A belt 63 passes around each of the pulleys 60 and is supported at its opposite end by a pulley 64 journaled on the shaft 62

to rotate independently of the sprocket wheel for the chains 61. It will be seen from Figs. 1 and 4 that the inner runs of the belts 63 form the side walls of a slideway along the central portion of the table 10 for receiving the cartons 23 as they are discharged from the feed rollers 30. The connecting links 65 of the chains 61 bear directly against the faces of the belt 63 opposite the slideway thus formed and provide supports for the belt 63 to hold the belts firmly in engagement with the end flaps of the cartons. The pivot pins of the chains 61 are provided with rollers 66 which travel along ribs 67 carried at the upper edges of angle bars 68 which thus form guide rails for the chains 61 and hold the chains in place against the faces of the belts 63. It will be seen that the rollers 66 do not engage the belts 63 but that the belts are supported in position against the cartons by the links 65 so that there is no relative movement between the belts 63 and the portion of the supporting chains which engage the belts. The angle bars 68 are adjustably connected with the upper face of the table top 10 by cap screws 69 passing through slots 70 in the horizontal webs of the angle bars.

It will be apparent from Fig. 1 of the drawings that the pitch diameter of the sprocket wheel 54 which drives the chains 61 is less than the diameter of the pulley 60 which drives the belts 63 so that if the sprocket wheel 54 and pulley 60 were given the same angular speed there would be a small amount of slippage between the chains 61 and the belts 63. To avoid this slippage the gear wheel 57 is made somewhat larger than the gear 52 so that the angular speed of the pulley 60 is correspondingly less than the angular speed of the sprocket wheel 54. The reduction is just sufficient to impart the same linear speed to the chains 61 and the belts 63, thus avoiding any relative movement between the contacting parts of the chains and belts.

As a filled carton is moved between the glue rolls 20 adhesive material from the receptacles 21 is spread upon the inner faces of the end flaps 24 which flaps are then bent inwardly against the previously closed flaps 25 by the combined rotary and wedging action of the folding discs 29. Since the discs 29 are rotated in a direction to assist in the feeding of cartons there is no tendency for the discs to retard one wall of the carton, resulting in contortion of the walls of the carton, as is the case where the flaps are folded by stationary inclined guides. The folding discs 29 are provided with shoulders 71, as shown in Fig. 6, which form square corners with the folding portion of the discs to true the folded flaps 24. At the same time that the flaps 24 are folded into position against the ends of the carton

the carton is fed forwardly by the friction rollers 30 and the walls of the carton are brought into rectangular position relative to one another to true the end flaps, as previously described. This moves the carton into position to be received between the inner runs of the belts 63 which slowly carry the cartons along the upper face of the table top 10 and firmly hold the folded flaps in position to permit the adhesive material to set. It will be seen from the various figures of the drawings that reduction gearing is used for moving the belts 63 so that a comparatively slow movement of the cartons along the upper face of the table top is provided. This allows sufficient time for the adhesive material to set before the cartons are discharged from between the belts. A firm pressure against the closed flaps is maintained at all times since the belts are supported on their faces opposite the cartons in a straight line and not permitted to sag away from the work.

I claim:—

1. The combination with means for moving a carton having a flap thereon, of a rotary member having a convex inclined face arranged to engage said flap for closing said flap.

2. The combination with means for moving a carton having a flap thereon, of means for closing said flap having a convex inclined face arranged to engage said flap and having the flap-engaging portion thereof arranged to move substantially in unison with the movement of said carton.

3. The combination with means for moving a carton having a closing flap thereon, of a rotary disc having a beveled convex surface for engaging said flap to close said flap, and means for rotating said disc to move the engaging surface thereof in the direction of movement of said carton.

4. The combination with means for closing a carton, of means for moving one wall of said carton in the direction of its plane and relative to another wall thereof to true said carton.

5. The combination with means for closing a carton, of means for moving said carton by exerting a moving force on one wall thereof while another wall thereof is retarded for trueing said carton during the movement thereof.

6. The combination with means for exerting pressure on a carton near one wall thereof and in the direction of the plane of said wall, of means for exerting pressure in an opposite direction on another wall of said carton to bring the walls of said carton in proper position relative to one another, and means for closing said carton while the walls thereof are so positioned.

7. The combination with means for shifting opposite walls of a carton relative to

one another and in the direction of their planes to true said carton, of means for sealing said carton while the walls are so shifted to retain the walls of said carton in trued position.

8. In combination, a slideway for supporting a carton, of means for engaging said carton at a point removed from said slideway to move said carton along said slideway and to shift the walls of said carton relative to one another to true said walls.

9. The combination with a slideway for supporting a carton, of frictional means for engaging the upper wall of a carton supported on said slideway for moving said carton along said slideway and trueing the walls thereof, and means for closing said carton while the walls thereof are held in trued position by said slideway and said frictional means.

10. The combination with a slideway for supporting a carton, of frictional means for engaging the wall of said carton away from said slideway to move said carton on said slideway and to shift the walls of said carton relative to one another for trueing said carton, and means for closing and sealing flaps on said carton to hold said carton in trued position.

11. The combination with a slideway for supporting a carton, of a roller having a frictional surface thereon for moving a carton along said slideway by exerting a pressure thereon in a direction to oppose the friction between said carton and said slideway so that the walls of said carton will be shifted relative to one another, and a rotary member for engaging a flap on said carton and closing said flap.

12. The combination with a slideway for a carton, of means for applying adhesive material to an end flap on said carton, means for frictionally engaging the upper face of said carton to move said carton along said slideway and to true the walls of said carton relative to one another, and means for folding said flap to bring the face thereof having adhesive material thereon into position to seal said carton and to hold the wall thereof in trued position.

13. The combination with a slideway for supporting a carton, of means for applying adhesive material to a flap on said carton, a roller having a frictional surface arranged to engage the upper face of said carton and move said carton along said slideway and shift the walls of said carton relative to one another to true said carton, a disc having an inclined face arranged to engage said flap and fold said flap to bring the adhesive coated surface thereof into engagement with said carton to close said carton and to hold the walls thereof in trued position, and means for rotating said disc to cause the en-

gaging face thereof to travel substantially in unison with said carton during said closing operation.

14. A carton sealing device comprising means for applying adhesive to a carton flap and for folding said flap into closed position, of means for engaging said closed flap and for moving in unison with said carton to hold said flap in closed position to permit the adhesive thereon to set, and a support for said engaging means arranged to travel in unison therewith.

15. The combination with means for applying adhesive to a carton flap and for folding said flap into closed position, of a flexible member arranged to engage said flap and to travel in unison with said carton to hold said flap in closed position while the adhesive thereon sets, a flexible support arranged to travel in unison with said flexible member, and a stationary guide for said flexible support.

16. The combination with means for applying adhesive material to a carton flap and for folding said flap into closed position, of means for holding said flap in said position while said adhesive material sets, said holding means comprising an endless flexible belt arranged to engage said flap, means for moving said belt in unison with the movement of said carton, and means arranged to travel in unison with said belt for holding said belt against said carton.

17. The combination with means for applying adhesive material to a carton flap and for folding said flap into closed position against said carton, of means for holding said flap in closed position while the adhesive material thereon sets, said holding means comprising an endless flexible belt, means for driving said belt in unison with said carton, an endless flexible member arranged to engage the face of said belt opposite said carton, means for driving said flexible member in unison with the movement of said belt, and a stationary guide for said flexible member to hold said member against said belt.

18. The combination with means for applying adhesive to a carton flap and for folding said flap into closed position against said carton, of means for holding said flap in closed position while the adhesive thereon sets, said holding means comprising a flexible belt arranged to engage said flap and to travel in unison therewith, a chain having links thereon arranged to engage the face of said belt opposite said carton, a guide for holding said chain against said belt, and anti-friction members interposed between said chain and guide.

19. The combination with means for applying adhesive material to a carton flap and for folding said flap into closed position against said carton, of means for holding

said flap in closed position while the adhesive material thereon sets, said holding means comprising an endless flexible belt, a pulley for driving said belt in unison with said carton, an endless chain arranged within the path of movement of said belt, a sprocket wheel of less pitch diameter than said pulley for driving said chain, speed reduction gearing between said sprocket wheel and pulley for imparting different angular velocities to said wheel and pulley so that the linear velocities of said chain and belt shall be the same, and a guide for engaging said chain to hold said chain against said belt to insure uniform pressure upon said flap.

20. The combination with means for applying adhesive material to a carton flap and for closing said flap, of means for holding said flap in closed position while the adhesive material thereon sets, said holding means comprising a pair of oppositely disposed belts arranged to engage opposite faces of said carton, means for driving said belts to move said carton, and means arranged to travel in unison with said belts to support said belts in contact with said carton.

21. The combination with means for applying adhesive material to a carton flap and for folding said flap against said carton, of means for holding said flap in closed position while the adhesive material thereon sets, said means comprising a pair of oppositely disposed flexible belts for engaging opposite faces of said carton, flexible members arranged to travel in unison with said belts and in contact with the faces thereof opposite said cartons for supporting said belts against said cartons, and guides for said supporting flexible members.

22. The combination with a slideway, of means for applying adhesive material to the flaps of a carton supported on said slideway, means for folding said flaps into closed position against said carton and for shifting opposite walls thereof relative to one another in the direction of their planes for trueing the walls of said carton, and means for holding said flaps in closed position while the adhesive material thereon is setting.

23. The combination with a slideway, of means for applying adhesive material to the flaps of a carton on said slideway, frictional means for engaging said carton to move said carton along said slideway and to true the walls of said carton, and movable members for engaging the flaps on said carton and for moving said carton along said slideway while the adhesive material on said flaps is permitted to set.

24. The combination with a slideway, of means for applying adhesive material to the flaps of cartons supported on said slideway, a roller having a frictional surface

for engaging said cartons to move said cartons along said slideway, rotary members for folding said flaps into closed position against said cartons, flexible belts for engaging the closed flaps of said cartons and for moving said cartons along said slideway, endless chains arranged to engage said belts and to travel in unison therewith to hold said belts against said cartons, and guides for supporting said chains in contact with said belts.

25. The combination with means for closing a carton having adhesive material applied thereto, of means for retaining said carton in closed position while the adhesive material sets, said retaining means comprising a traveling belt for moving said carton and for holding said carton closed during the movement thereof, and means arranged to travel with said belt and at the same speed as said belt for holding said belt in contact with said carton.

26. The combination with means for closing a carton having adhesive material applied thereto, of means for retaining said carton closed while the adhesive material sets, said means comprising a flexible member arranged to travel in contact with said carton, a support for said flexible member for holding said member in engagement with said carton, and means for moving said support in the direction of movement of said flexible member and at the same speed as said member.

27. The combination with means for closing a carton having adhesive material applied thereto, of means for retaining said carton closed while the adhesive material sets, said retaining means comprising a flexible member arranged to engage said carton and travel therewith, a support for said flexible member arranged to move in the direction of movement of said flexible member to hold said flexible member in engagement with said carton, and a stationary support for said movable support.

28. The combination with means for closing a carton flap having adhesive material applied thereto, of means for retaining said flap in closed position while the adhesive material sets, said retaining means comprising a flexible member arranged to engage said carton and travel therewith, a second flexible member arranged to move in the direction of movement of said first-mentioned flexible member for holding said first-mentioned flexible member in engagement with said carton, and a stationary support for said second-mentioned flexible member.

29. The combination with means for closing a carton flap having adhesive material for securing said flap in closed position, of means for retaining said flap in said position while the adhesive material sets, said

means comprising a flexible belt for engaging said flap arranged to move in unison therewith, and a chain for holding said belt in engagement with said flap, said chain being arranged to engage the face of said belt opposite said flap and to travel in the direction of movement of said belt and at the same speed as said belt.

30. The combination with means for closing and sticking a flap of a carton, of means for retaining said flap closed comprising a flexible belt for engaging said flap, means for moving said belt in unison with said carton to exert pressure on said flap, a chain arranged to engage said belt at the side thereof opposite said carton, and a guide for holding said chain against said belt.

31. The combination with means for applying adhesive material to a carton flap and for closing said flap, of means for retaining said flap in closed position while the adhesive material sets, said retaining means comprising a flexible belt for engaging said flap, means for moving said belt in unison with said carton, a chain for holding said belt in contact with said flap, a guide for said chain, and anti-friction means interposed between said chain and guide.

32. The combination with closing and gluing means for a carton, of means for retaining said carton in closed position comprising a flexible belt arranged to engage said carton and move in unison therewith, a chain having links thereof arranged to engage said belt and hold said belt against said carton, anti-friction rollers on said chain, and a guide for said anti-friction rollers arranged to hold said chain against said belt.

33. The combination with closing mechanism for a carton employing adhesive material, of means for retaining said carton closed while said material sets, said retaining means comprising a pair of flexible elements arranged to travel in contact with one another, rotary members having different pitch diameters for driving said elements, and means for imparting different angular velocities to said rotary members to cause said elements to move in unison with one another.

34. The combination with mechanism for closing a carton using adhesive material, of means for holding said carton closed to permit said material to set, said holding means comprising a pair of endless flexible elements arranged one within the path of movement of the other, rotary members having different pitch diameters for driving said elements, and gearing for imparting a fixed relative speed to said rotary members to drive said elements at the same linear velocity.

35. The combination with closing mechanism for cartons employing adhesive mate-

rial, of means for holding said cartons closed while said material sets, said means comprising a flexible element arranged to engage said carton and travel in unison therewith, a second flexible element for supporting said first-named belt, rotary members having different pitch diameters for driving said elements, and means for imparting different angular velocities to said rotary members to cause the contact portions of said elements to move with the same linear velocity in contact with one another.

36. The combination with carton closing mechanism employing adhesive material, of means for holding the cartons closed during the setting of said material, said holding means comprising a belt, a supporting chain for said belt, means for driving said belt and chain at the same linear speed, a guide rail for supporting said chain, and rollers on said chain for engaging said guide rail while other parts of said chain support said belt.

37. The combination with carton closing mechanism, of means for holding said carton closed comprising a belt, a chain arranged to travel at the same rate of speed as said belt and having parts thereof arranged to engage said belt, a fixed guide for said chain, and rollers on said chain for contacting with said guide.

38. The combination with carton closing mechanism, of means for holding the cartons closed comprising a belt for engaging the cartons and moving in contact therewith, a chain having the links thereof arranged to engage and support said belt, means for driving said chain in unison with said belt, a guide rail for said chain, and rollers on said chain arranged to travel on said guide rail and support said chain against said belt.

39. The combination with carton closing and sealing mechanism, of means for holding a carton closed comprising a belt, a supporting chain for said belt, and means for driving said supporting chain at the same linear speed as said belt.

40. The combination with carton closing and sealing mechanism, of means for holding a carton closed comprising a belt, a supporting chain for said belt arranged to move in contact therewith, and means for driving said chain and belt at the same rate of linear speed.

41. The combination with carton closing and sealing mechanism, of means for hold-

ing a carton closed comprising a flexible member, means for driving said member to move cartons in contact therewith, a support for said flexible member, and means for moving said support in unison with said member.

42. The combination with carton closing and sealing mechanism, of means for retaining a carton closed comprising a flexible member, means for driving said member in unison with cartons engaged thereby, a flexible support for said member, a guide for said flexible support, and means for driving said support to move said support along said guide and in contact with said flexible member and at the same rate of speed as said flexible member.

43. The combination with carton closing and sealing mechanism employing adhesive material, of means for holding said carton closed while said adhesive material sets, said holding means comprising a flexible belt, means for driving said belt in unison with a carton engaged thereby, a chain for supporting said belt, a guide rail for said chain, and means for driving said chain along said guide rail and in contact with said belt and at the same linear speed as said belt.

44. The combination with means for moving a carton having a flap thereon to be closed against one face of said carton, of a rotary member for closing said flap having a convex surface for engaging said flap, the inner portion of said surface being substantially parallel to said face during a closing operation.

45. The combination with means for closing a carton, of means for engaging one wall of said carton to propel said carton and to move said wall in the direction of the plane thereof and relative to the opposite wall of said carton to true said carton.

46. The combination with means for closing a carton, of means for frictionally engaging one wall of said carton to propel said carton and to move said wall in the direction of its plane relative to the opposite wall thereof to true said carton, and means for frictionally engaging the said opposite wall of said carton to retard said wall during such movement.

In testimony whereof I have signed my name to this specification on this 2nd day of January, A. D. 1920.

MICHAEL J. MILMOE.