

No. 632,103.

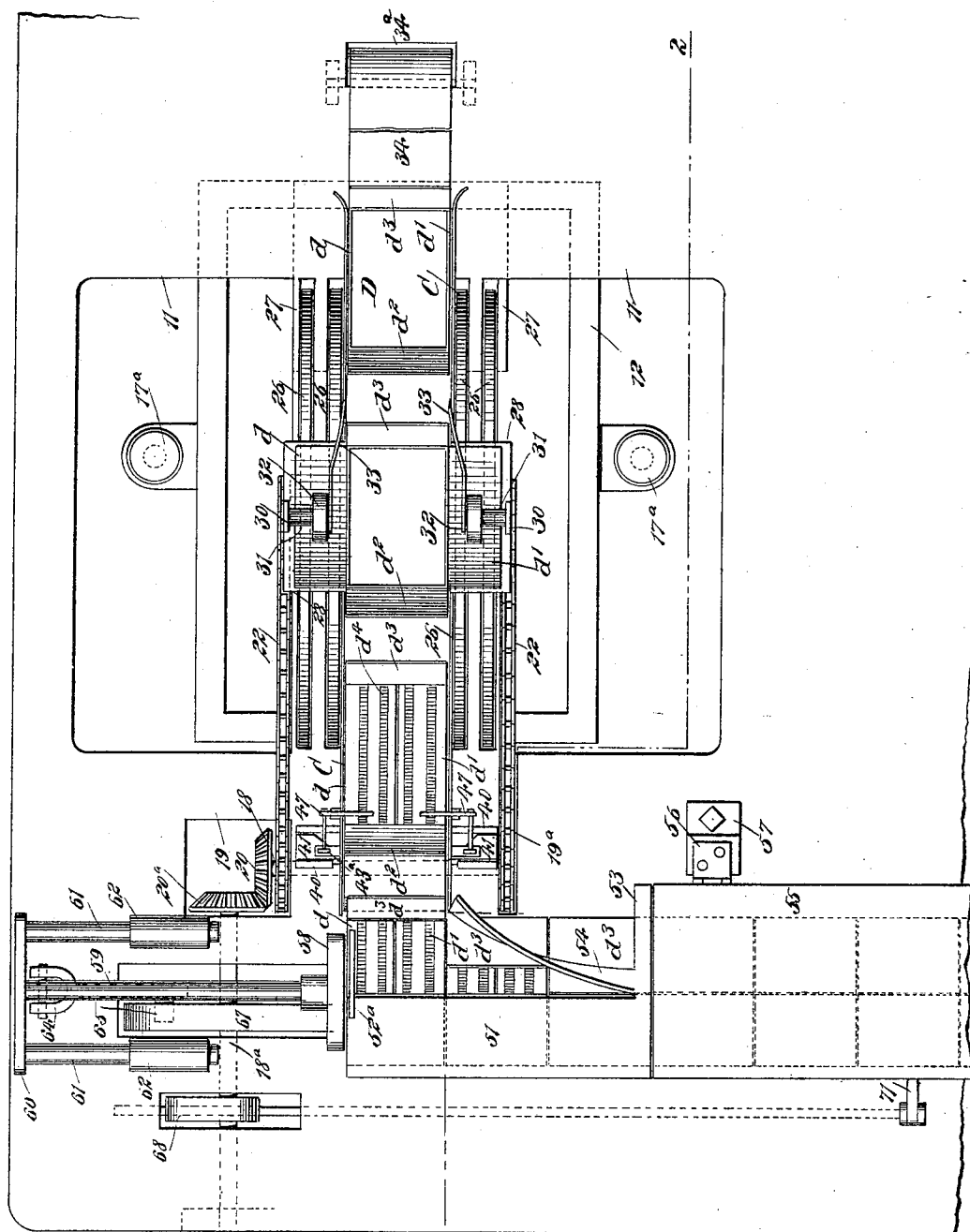
Patented Aug. 29, 1899.

J. T. CRAW.
BOX SEALING MACHINE.

(Application filed Apr. 20, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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Fig. 1.

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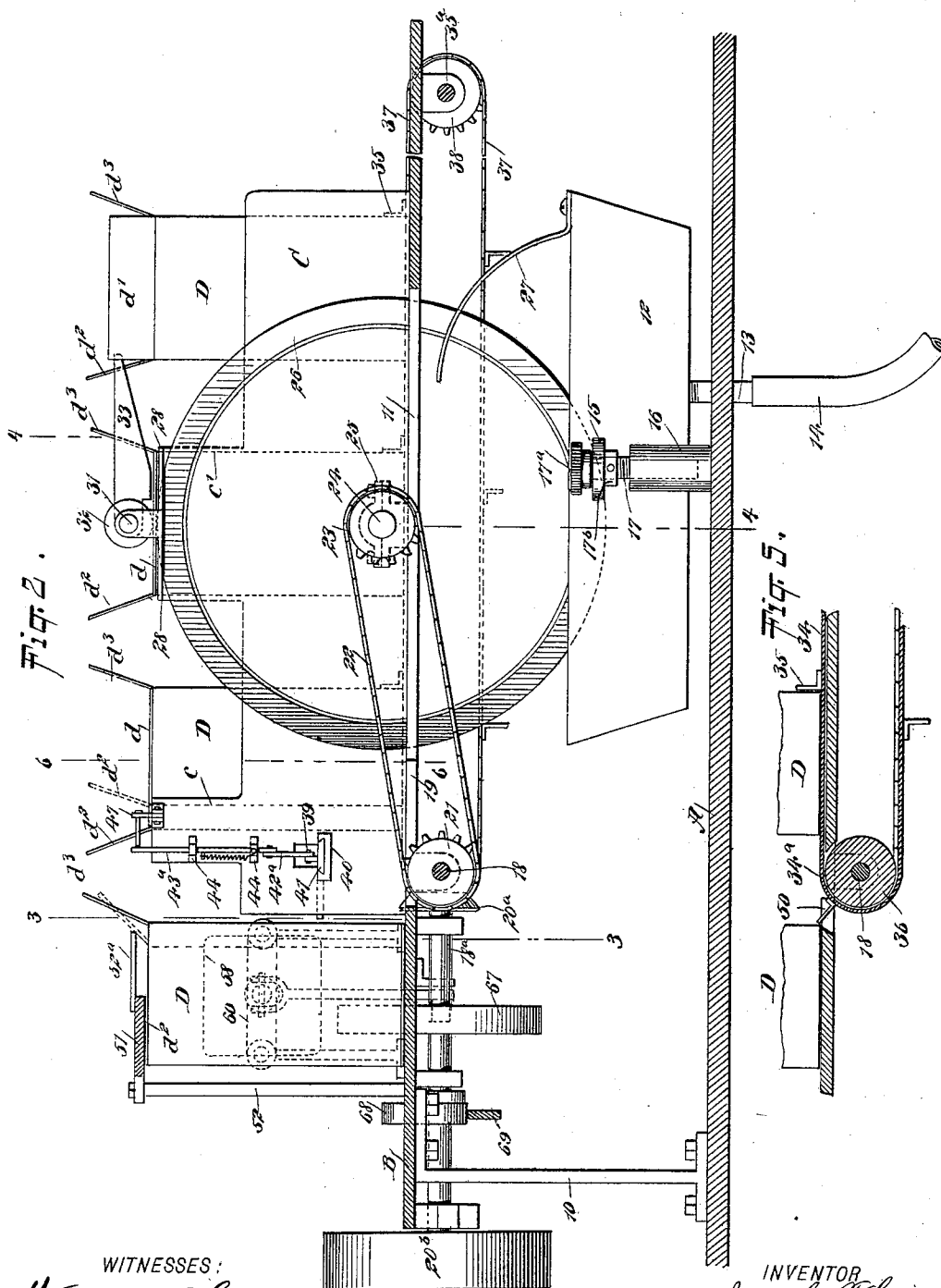
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4 Sheets—Sheet 2.



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Fig. 6.

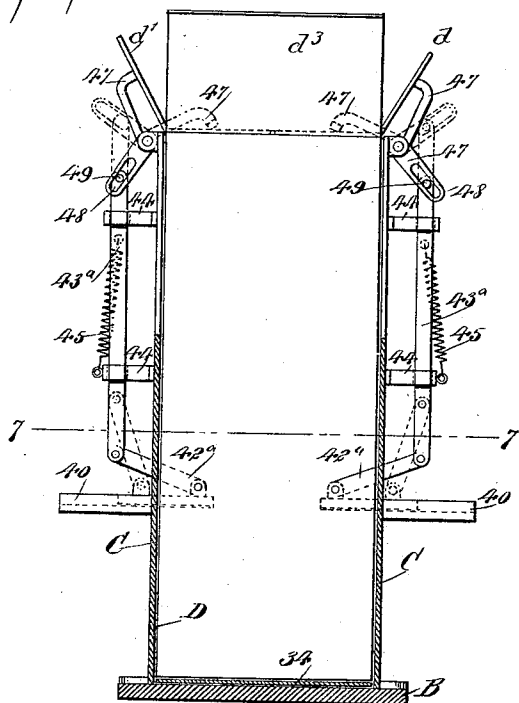


Fig. 8.

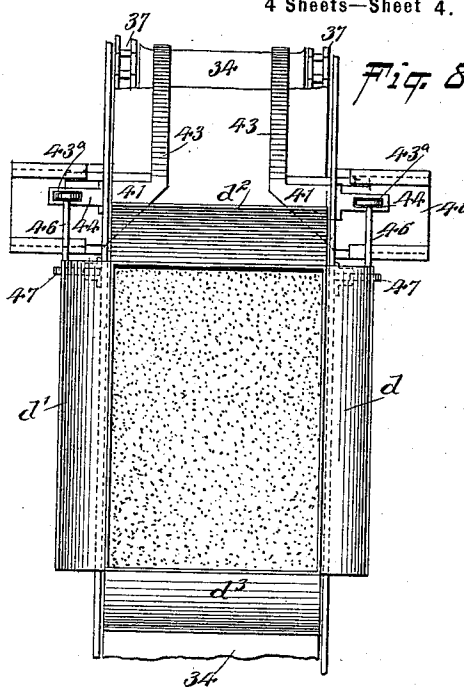


Fig. 7.

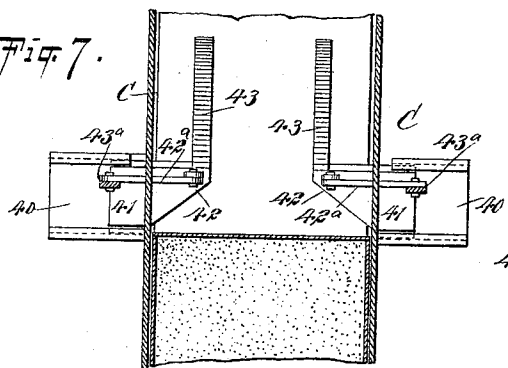


Fig. 9.

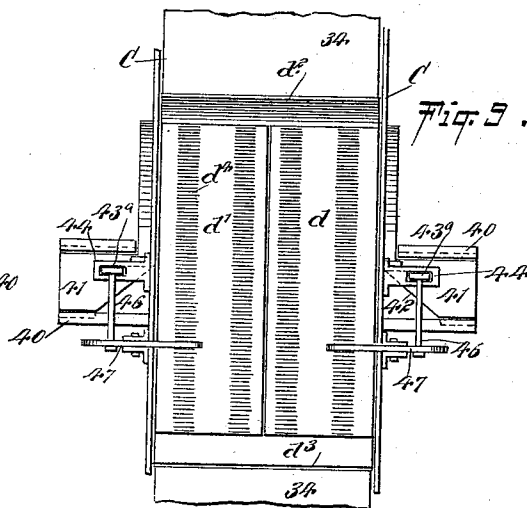


Fig. 10.

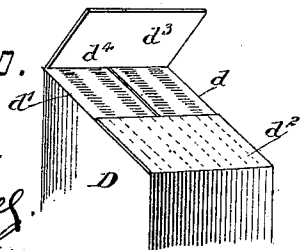
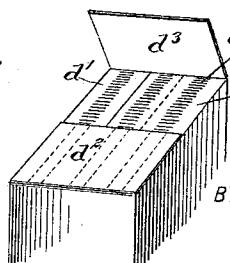


Fig. 11.



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UNITED STATES PATENT OFFICE.

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BOX-SEALING MACHINE.

SPECIFICATION forming part of Letters Patent No. 632,103, dated August 29, 1899.

Application filed April 20, 1899. Serial No. 713,809. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH T. CRAW, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and Improved Machine for Sealing Paper Boxes, of which the following is a full, clear, and exact description.

The object of my invention is to provide a machine especially adapted for sealing the flaps of paper boxes after the said boxes have been filled and to so construct the machine that it will be very simple of its kind and durable and whereby the boxes may be manipulated by a single operator in an expeditious, convenient, and effective manner.

Another object of the invention is to provide for the distribution of cementing or gluing material to the portions of the flaps to be sealed and to provide means for automatically applying the cement or glue and for folding the flaps to a sealing position, it being only necessary for the operator to feed the filled boxes to the machine.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the machine. Fig. 2 is a longitudinal section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is a vertical section taken substantially on the line 3 3 of Fig. 2. Fig. 4 is a vertical section taken practically on the line 4 4 of Fig. 2. Fig. 5 is a detail sectional view through a portion of the working table and a portion of the conveyer-belt. Fig. 6 is a vertical section taken substantially on the line 6 6 of Fig. 2. Fig. 7 is a horizontal section taken on the line 7 7 of Fig. 6. Fig. 8 is a plan view of the mechanism shown in Fig. 6. Fig. 9 is a view similar to Fig. 8, illustrating the inner flaps of a box as folded down upon the material and gummed to receive the outer flaps. Fig. 10 is a perspective view of the upper part of a box, illustrating one of the outer flaps as secured upon the inner flaps, the inner flaps abutting at the joining ends; and Fig. 11 is a

view similar to Fig. 10, the inner flaps being shown, however, as overlapping.

A represents a table or other support, and B a working table or platform held above the support A by suitable standards 10. The working table or platform B is provided at each side of its center with openings 11, and below that portion of the table in which the openings 11 occur a glue-pot 12 is adjustably supported. The jacket of this glue or paste pot 12 is provided with steam, preferably through the medium of a metal pipe 13 and a flexible pipe 14, the metal pipe having vertical movement in the support A. The adjustment of the glue or paste pot is usually accomplished by forming lugs 15 on the sides of the pot and locating sockets 16 upon the support or base A beneath said lugs, while a screw 17 is held to freely turn in each lug 15 and to enter the sockets 16. Each screw is provided with a head 17^a above the lug through which it passes and with a collar 17^b immediately below said lug. The heads of the screws 17 are conveniently reached through the openings 11, and by turning the said screws the glue or paste pot may be raised or lowered as required.

A shaft 18 is journaled beneath the working table or platform B at a point between its center and rear end and openings 19 19^a are made in said working table or platform at the ends of the shaft 18, as shown in Fig. 1. The shaft 18 is provided with a beveled gear 20 at one end, which meshes with a like gear 20^a, secured on the driving-shaft 18^a, likewise located beneath the working table or platform B, the said drive-shaft having a suitable driving-pulley 20^b attached to it. The shaft 18 is provided near each end with a sprocket-wheel 21 and chain belts 22 are passed over said sprocket-wheels and over sprocket-wheels 23, secured at the ends of a shaft 24, which shaft is journaled in bearings 25, located at about the central portion of the platform B.

The shaft 24 is provided near each end with one or two—usually two—pasting wheels or disks 26, and these pasting wheels or disks have their peripheral surfaces suitably prepared to take up paste or glue. The pasting wheels or disks pass through suitable slots

made in the platform or working table B, as shown in Fig. 4, and the said pasting-wheels extend downward into the paste or glue pot. As the paste or glue is used up the glue-pot 12 is adjusted upwardly, so that all of the paste or glue contained in the pot may be utilized, and suitable doctors 27 are provided for the pasting wheels or disks, as shown in Fig. 2.

A wall C, preferably of metal, is erected longitudinally of the working table or platform B at each side of its center, and the space between these walls is just sufficient to receive the body portion of the box D whose flaps are to be sealed, as illustrated in Fig. 4. These walls C are between the box and the inner pasting-wheels 26, as is also shown in Fig. 4. Each wall is provided with an upward extension *c* near its rear end and with a central-upward extension *c'*, as shown in Fig. 2. An outwardly-extending horizontal flange 28 is formed at the upper end of the central extension *c'* of each wall C, as is best shown in Fig. 4, and these flanges are provided with slots 29, through which the peripheral portions of the pasting wheels or disks 26 extend, and these flanges likewise serve as partial supports for the inner flaps of the box D when said flaps are to be glued, and the glue or paste is applied to the outer surfaces of said inner flaps of the box, as is also shown in Fig. 4, the said inner flaps being held against the pasting wheels or disks 26 by pressure-rollers 32, and these rollers are located above the flanges 28 between the pasting disks or wheels 26. The rollers 32 are mounted to revolve upon spindles 31, and said spindles are attached to brackets 30, that extend upward from the outer edges of the flanges 28. A plow or guide-finger 33 is secured to the inner end of each spindle 31 and the forward portions of these plows or guide-fingers are beveled upon their under faces, so that their forward ends are somewhat sharp, and the forward or beveled portions of the plows or guide-fingers are inclined in direction of each other, so that their forward ends are substantially in the same plane with the inner faces of the walls C, as shown in Fig. 1.

A conveyer-belt 34 is adapted to pass through suitable openings 34^a, made in the platform or working table B near the front and near the rear, and the said conveyer-belt 34 is provided with a series of upwardly-extending lugs 35, transversely arranged thereon, and the distance between these lugs is greater than the greatest width or depth of the boxes whose flaps are to be sealed, as illustrated in Fig. 5. The conveyer-belt 34 passes over drums 36, one located beneath the openings 34^a and one drum being upon the driven shaft 18 and the other drum upon a spindle 35^a, as shown in Fig. 2, and upon the shaft 18, at each side of the drum thereon, a sprocket-wheel 38 is secured, similar wheels being secured upon the spindle 35^a at each end of the drum carried thereby. Endless

chain belts 37 are passed over the sprocket-wheels 38, and said chain belts are secured to the conveyer-belt 34, as illustrated in Fig. 4. The conveyer-belt passes between the walls C and is of sufficient width to extend from one wall to the other. Slots 50 are made in the rear wall of the opening opposite the rear drum 36 and opposite the forward end of the forward drum to provide, respectively, for the downward and upward passage of the lugs 35.

An opening 39 is made in each wall C near its rear end, and a slideway 40 extends horizontally outward from each wall at the bottom portion of each slot 39, as shown in Fig. 2. A slide 41 is mounted in each slideway 40, and each slide 41 is provided at its forward inner edge with an inclined surface 42, as shown best in Figs. 7 and 9. Each slide 41 is further provided at its inner end with a rearwardly-extending strip section or finger 43, said strip sections or fingers 43 being parallel with the walls C, as shown in Fig. 7. These slides are normally held in such position that their inclined edges 42 will be in the path of a box D, that is passed through the space between the walls C, as illustrated in Fig. 7, and such a disposition of the slides 41 is maintained by connecting-links 42^a to the inner ends of said slides, which links extend outward through the openings 39, and the outer ends of the links 42^a are pivotally attached to rods 43^a, said rods 43^a being held to slide in guides 44, secured to the outer surfaces of the walls C, as illustrated in Figs. 2 and 6. Springs 45, attached to the lower guides 44 and to the upper portions of the rods 43^a, serve to hold the said rods in a lowered position or in position to force the links 42^a to carry and maintain the slides 41 within the space between the walls C. An angle-lever 47 is pivoted on a shaft 46 upon the outer face of each wall C at the top of its rear extension *c*. The lower end of each lever is provided with a slot 48, and pins 49, carried by the rods 43^a, enter the said slots. The upper ends of the angle-lever 47 are bent slightly inward or in direction of each other and are adapted at proper time or when the slides 41 are forced outward to engage with the gummed inner flaps of the box D and press said flaps down tightly over the contents of the box, as illustrated in dotted lines in Fig. 6.

A horizontal shed 51 is located transversely above the platform or working table B at the rear of the wall C, and this shed is provided with any suitable supports 52. The support for the shed, however, is preferably located at its rear edge and extends from end to end. At the front portion of that end of the shed nearest the outermost wall C a forwardly-extending finger 52^a is located, the said finger being adapted to strike the adjacent outer flap of the box directed to the shed and force the said flap downward in direction of the closed gummed flaps, as shown in dotted lines

in Fig. 2, and when the outer flap thus folded down is brought beneath the shed 51 said shed forces said flap firmly against the gummed surface of the inner flaps. A forward extension 53 is provided at the end of the shed 51 farthest removed from the wall C, and a spiral plow or guide-plate 54 is attached to the shed where it connects with the extension 53, and said plow 54 extends diagonally from the shed to meet the rear end of the adjacent wall C, as is plainly shown in Fig. 1.

The boxes that are beneath the shed 51 are to be moved at right angles to the walls C, between which they were first passed, and as the boxes are moved beneath the shed 51 the outer flap yet standing is engaged by the plow or guide-plate 54 and forced by said plow to the gummed surface of the inner flaps, as is also shown in Fig. 1. In this manner both the inner and outer flaps of a box are closed and the two sets of flaps thoroughly sealed together. The sealed flaps are in a measure fixed in their sealed position by passing under the extension 53. When the sealed boxes leave the shed 51 and while they are yet grouped together, they are passed beneath a weight 55, which weight is in the form of a plate and has a hinged connection 56 with uprights 57, and the sealed boxes remain beneath this weight until a sufficient number of boxes has been filled to crowd them out from under it; but the weight 55 is raised each time a box is carried beneath it in a manner to be shortly described. The movement of the boxes under the shed 51 and under the weight 55 is automatically performed and is preferably accomplished through the medium of a plunger 58, that engages with the outer wall of the first box under the shed 51, the said plunger being attached to a rod 59, and said rod in its turn is shown as secured to cross-bars 60, provided with guide-arms 61, that move in guide-sleeves 62, supported by suitable uprights 63. An elbow-lever 64 is pivotally attached to the plunger-rod 59, as shown in Fig. 3, and the lower end of said lever is provided with a pin 65, which pin is made to enter a cam-recess 66, made in a disk 67, secured upon the drive-shaft 18^a. A cam 68 is attached to the shaft 18^a, and this cam is adapted for engagement with the free end of a lever 69, fulcrumed near its center upon a support 70, attached to the bottom of the platform or working table B. The other end of the lever 69 is connected with the front edge of the weight 55 by means of a rod 71, as shown in Figs. 1 and 2. The normal position of the elbow-lever 64 is shown in dotted lines in Fig. 3, and when the lever is in such position the plunger 58 will be carried some distance from the entrance to the shed 51. When the pin 65 is in the extended portion of the cam-recess 66, the upper end of the lever 64 is carried in direction of the boxes and made to engage said boxes, and the forward-and-rearward movement of the elbow-lever 64 is about equal to the width or thickness of a box.

Thus at each forward movement of the plunger 58 the boxes under the shed will be pushed outward the distance of the space occupied by a box. The cam 68 is so placed on the shaft 18^a that when the plunger engages with the outermost box under the shed the lever 69 will be pressed downward at its free end sufficiently to raise the weight 55 from the sealed boxes, as shown in positive lines in Fig. 3, thus permitting the column of boxes under the shed and beneath the weight to be readily moved. The box as a whole has been designated as D; but in order that the several flaps may be readily distinguished upon the drawings I have designated the two inner flaps as d and d' , the two outer flaps as d^2 and d^3 , and the line of paste on the inner flaps as d^4 .

In operation the filled box is placed by the operator upon the conveyer-belt 34 in front of a set of lugs 35. As the belt moves rearward the box is carried with it, and the plows or guide-fingers 33 engage with the inner faces of the inner flaps d and d' and force said flaps downward upon the flanges 28, as shown in Fig. 1, and as the box is carried rearward the outer faces of said inner flaps are brought in contact with the pasting wheels or disks 26, and lines of paste or glue d^4 are placed upon said flaps, the flaps being held against the pasting-wheels by the pressure-rollers 32, as heretofore mentioned. When the flaps have received their lines of paste or glue and have passed the pressure-rollers 32, they naturally assume more or less of an erect position, and as the box moves farther rearward the rear surface of the body of the box will strike the inclined surface 42 on the slides 41 and press the said slides outward, thus bringing the upper members of the angle-levers 47 against the side flaps, and said levers will force the side flaps downward upon the contents of the box, as shown in dotted lines in Fig. 6 and in positive lines in Fig. 1. The fixing-levers 47 continue to press upon the inner flaps until the box has cleared the extensions 43 of the slides, whereupon the springs 45 act, and the slides are returned to their normal position, and the fixing-levers are carried outward and assume their normal position ready for further action. The inner flaps d and d' of the box are now firmly fixed in position, and as the box moves farther rearward the finger 52^a strikes the outer flap d^2 , for example, and presses it downward upon the gummed surface of the inner flaps, and when the outer flap d^2 is passed beneath the shed 51 it is firmly fixed in position. The lever 69 then acts to raise the weight 55, and the plunger 58, acting immediately afterward, forces the box just entered beneath the shed backward the distance of one box, and as the several boxes are thus pushed beneath the shed 51 the other outer flap d^3 is closed down upon the gummed surface of the inner flaps by the plow 54. It is evident that the inner flaps may be made to abut, as shown in Fig.

10, or may be made to overlap, as shown in Fig. 11, and that in either event a perfect seal of the flaps is speedily and automatically accomplished.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for sealing paper boxes, a conveyer-belt for the boxes, vertical walls between which the conveyer travels and the boxes are sustained in upright position, devices mounted on the tops of the vertical walls for turning outwardly the flaps of the boxes, a gumming mechanism arranged for engagement with the turned-out flap on the external sides of said flaps, and means for temporarily retaining the flaps in engagement with the gumming mechanism all combined substantially as described.

2. In a mechanism for sealing paper boxes, vertical walls for the boxes, supports for the flaps of the boxes sustained on top of the vertical walls, devices also arranged on top of the vertical walls for turning outwardly the flaps of the boxes upon said supports, and a gumming mechanism arranged beneath said supports for contact with the outturned flaps while upon said supports all combined substantially as described.

3. In a machine for sealing paper boxes; vertical walls for the boxes, supports for the flaps of the boxes carried on top of the walls, pressure-rollers above said supports, a gumming mechanism arranged below and extending through said supports, and means for turning the flaps of the boxes outwardly upon the supports, all combined substantially as described.

4. The combination with table B, of paste-distributing disks or wheels mounted to revolve in openings in the table and to project both above and below the same, a paste or glue pot located below the disks and provided with means for adjusting it vertically to the disks, vertical walls for the boxes arranged between the paste-disks above the table B, and folding devices arranged on top of the vertical walls substantially as described.

5. In a machine for sealing paper boxes, a device for closing the flaps of said boxes comprising guides for the boxes, movable inclined surfaces in the path of said boxes between the guides and operated by the movement of the boxes, and folding devices operated thereby substantially as described.

6. In a machine for sealing paper boxes, guides for the boxes, levers carried by the guides and arranged to turn down flaps of the boxes passed between the guides, and a mechanism for operating said levers, a portion of said mechanism being in the path of a box moved between the guides, whereby the movements of said levers are controlled by the movement of the box the flaps of which are to be closed.

7. In a machine for sealing paper boxes, guides between which a box is adapted to

move, levers each provided with a member adapted to engage with a flap of the box and in one position of the levers to close said flap, slides located in the path of the box passed between the guides, said slides being operated in one direction by engagement with the box and being spring-operated in another direction, and a connection between said slides and said levers, substantially as described.

8. In a machine for sealing paper boxes, the combination, with guides between which a box is to move, slideways carried by the guides, slides mounted in said slideways, said slides extending normally in the space between the guides, the edges of the slides approached by the boxes being beveled, levers mounted upon said guides, adapted for engagement with flaps of a box passed between the guides, and likewise adapted to close said flaps and temporarily maintain them closed, spring-controlled rods connected with said levers, and link connections between said rods and said slides, as specified.

9. In a machine for sealing paper boxes, the combination, with guides between which a box is to move, slideways carried by the guides, slides mounted in said slideways, said slides extending normally in the space between the guides, the edges of the slides approached by the boxes being beveled, levers mounted upon said guides, adapted for engagement with flaps of a box passed between the guides, and likewise adapted to close said flaps and temporarily maintain them closed, spring-controlled rods connected with said levers, and link connections between said rods and said slides, each slide being provided with an extension at its inner end, the extensions of the slides being projected in direction of the travel of the box whose flaps are to be engaged by said levers, as set forth.

10. In a machine for sealing paper boxes, the combination with a carrier-belt and means for folding and pasting one pair of flaps; of guides for the boxes arranged at right angles to the carrier-belt and having at the top an overhanging shed adapted for engagement with the advance end flap and beneath which shed one end of the boxes are to pass, and means for automatically and periodically moving the boxes beneath said shed at right angles to the carrier-belt substantially as described.

11. In a machine for sealing paper boxes, the combination with a carrier-belt, and means for folding and pasting one pair of flaps; of guides for the boxes arranged at right angles to the carrier-belt and having at the top an overhanging shed adapted for engagement with the advance end flap and beneath which shed one end of each of the boxes is to pass, means for automatically and periodically moving the boxes beneath said shed at right angles to the carrier-belt and a finger projecting from said shed adapted to engage first with the flap of the box that approaches the shed substantially as set forth.

12. In a machine for sealing paper boxes, the combination of guides for the boxes, a shed overhanging one half of the guides and adapted for engagement with one of the flaps of all the boxes, and a plow arranged over the other half of the guides to close the opposing flaps mating with those engaged by the shed substantially as described.

13. In a machine for sealing paper boxes, guides for the boxes, a shed adapted to extend over a part of the sealed portion of the boxes, a weight adapted for engagement with the entire sealed surface of the boxes, said weight being independent of said shed, a plunger, a means for moving said plunger to an engagement with and away from the boxes, whereby the boxes are periodically moved beneath the shed, and devices for raising said weight when the plunger acts upon the boxes, as set forth.

14. In a machine for sealing paper boxes, guides for the boxes, a conveyer-belt mounted to travel between the guides, supports for flaps of the boxes located near the front portion of the guides, plows located over the said supports, being adapted to engage with the inner flaps of a box and direct said flaps to said supports, a gumming mechanism ar-

ranged for engagement with the inner flaps when upon said supports, sealing devices for the inner flaps, operated by the movement of the box, and means, substantially as described, for subsequently sealing the outer flaps upon the inner flaps, as set forth.

15. In a machine for sealing paper boxes, guides for the boxes, a conveyer-belt mounted to travel between the guides, supports for flaps of the boxes, located near the front portion of the guides, plows located over the said supports, being adapted to engage with the inner flaps of a box and direct said flaps to said supports, a gumming mechanism arranged for engagement with the inner flaps when upon said supports, sealing devices for the inner flaps, operated by the movement of a box, means, substantially as described, for subsequently sealing the outer flaps upon the inner flaps, and devices for moving the boxes when sealed and pressing firmly the sealed portions of said boxes, as set forth.

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