Sept. 20, 1938. S. BERGSTEIN 2,130,786

CONTAINER GLUING MACHINE

Filed Oct. 21, 1935 4 Sheets-Sheet 1

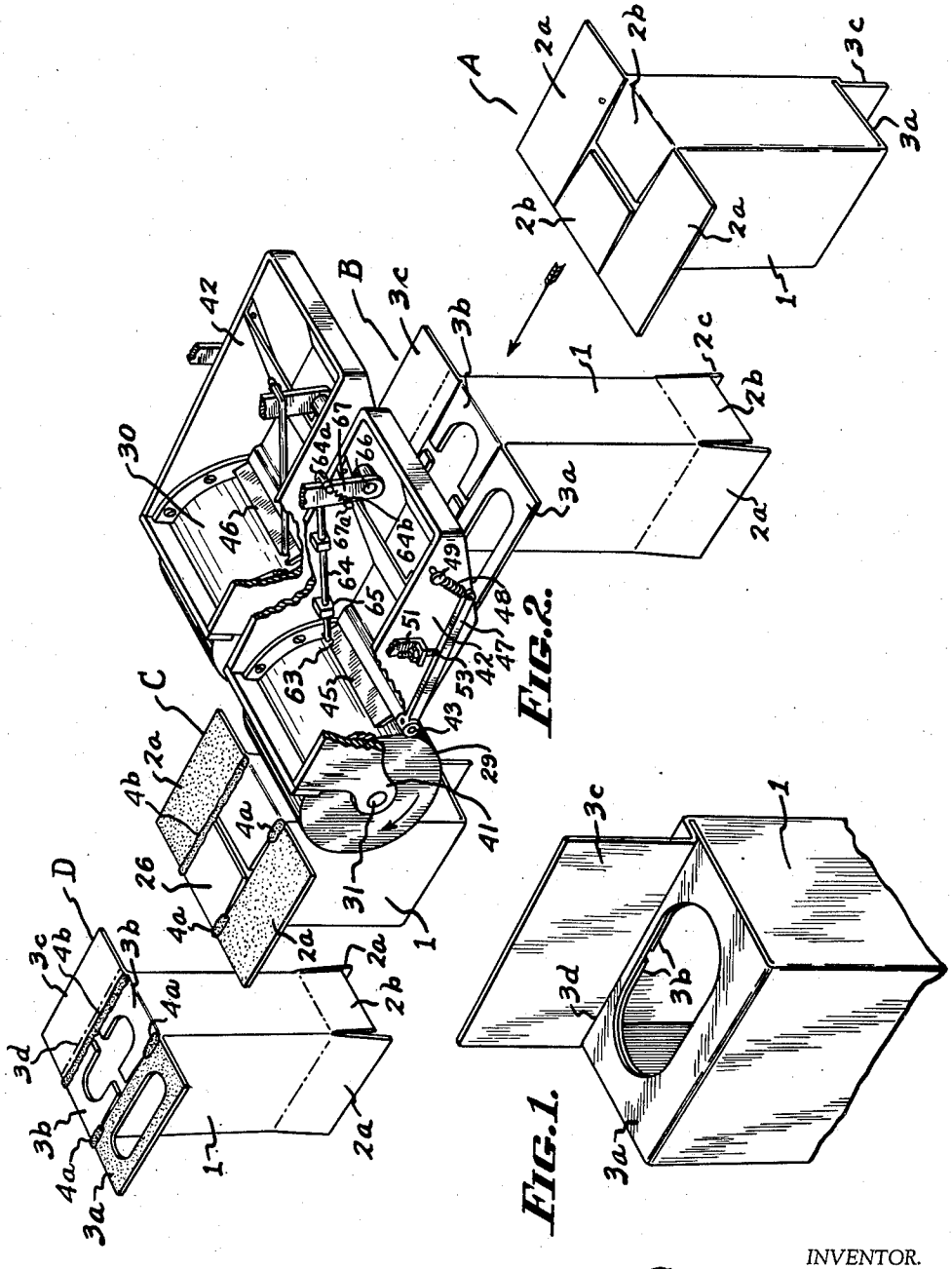

FIG. 2.

FIG. 1.

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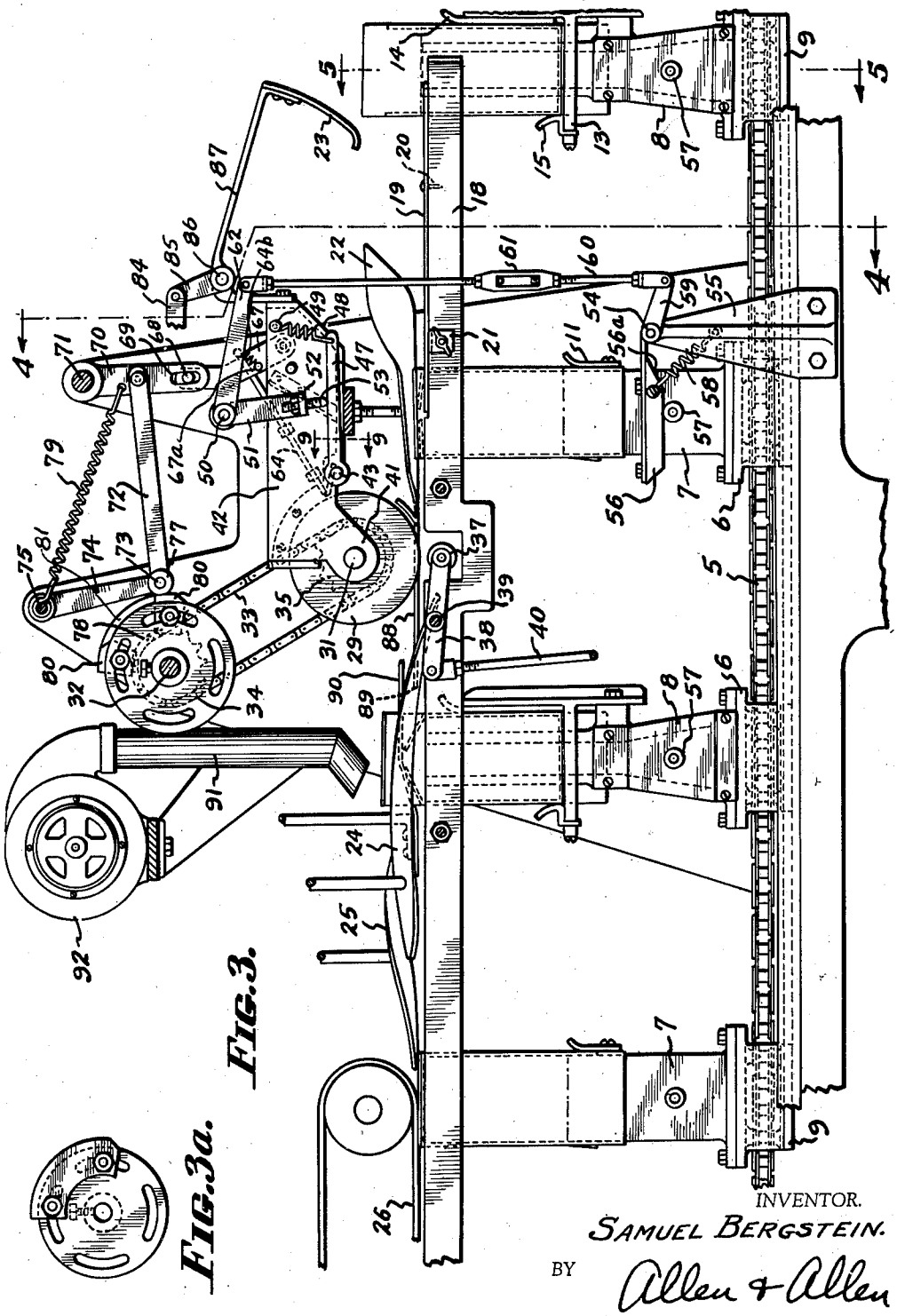

FIG. 3.

FIG. 3a.

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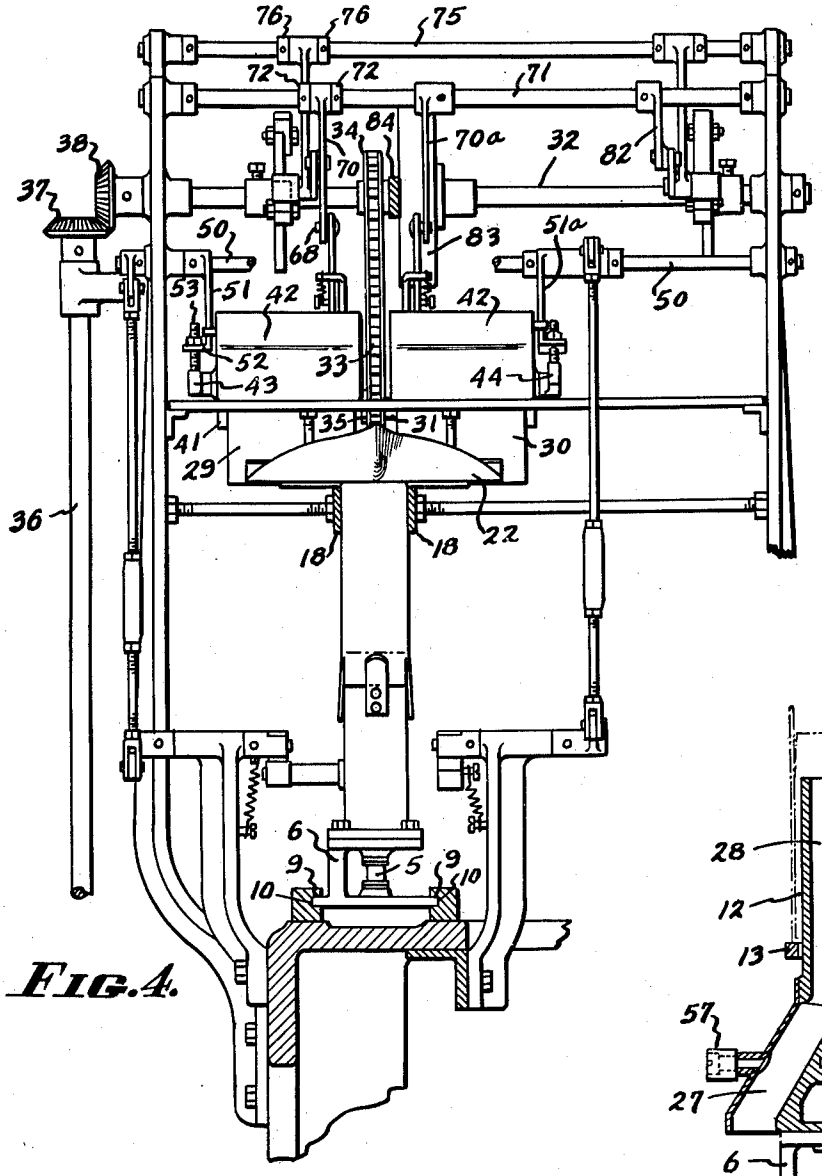


FIG. 4.

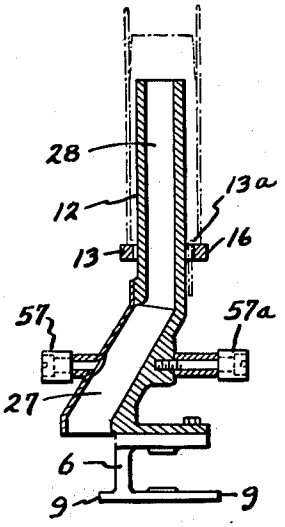
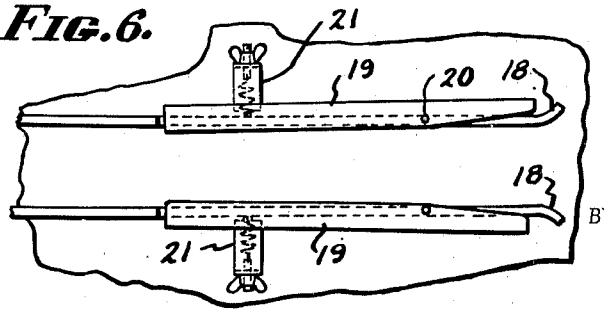


FIG. 5.

FIG. 6.



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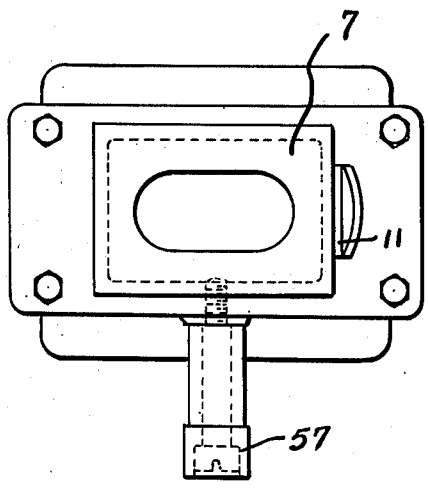

FIG. 7.

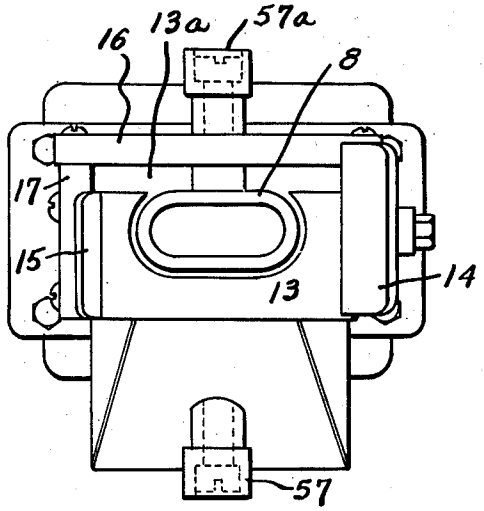

FIG. 8.

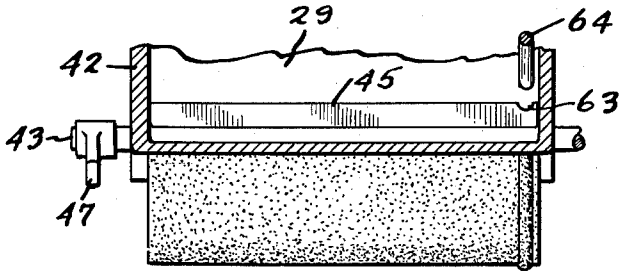

FIG. 9.

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Patented Sept. 20, 1938 2,130,786

UNITED STATES PATENT OFFICE

2,130,786

CONTAINER GLUING MACHINE

Samuel Bergstein, Cincinnati, Ohio, assignor to Edna May Bergstein and Robert Morris Bergstein, as trustees

Application October 21, 1935, Serial No. 45,975

7 Claims. (Cl. 91—36.4)

My invention relates to machines for gluing containers and cartons, and particularly to machines for gluing cartons which are to be used as containers for oils or other liquids, although it is not limited thereto. In cartons of this type it is necessary to provide for leak proofing, and in my invention novel means are used for this purpose.

It has been suggested, in the gluing and sealing of cartons which are intended to contain liquids, to partially render the cartons leak-proof by spreading heavier beads of glue along certain portions of such cartons, whereby the glue along those portions renders the joints in the carton leak-proof. Further, the carton, as manufactured and ready for filling, may be sealed at one end, and have a sealable opening, with an unsealed closure flap, at the other end.

In this connection, it is an object of my invention to form heavier beads of glue on closure flaps of the carton in a predetermined pattern and in a novel and simple manner. It is also an object of my invention to provide a machine upon which both ends of such a carton may be sealed, the pattern of glue application on one of the side closure flaps of each end being the same, while the opposed closure flaps at said ends have adhesive applied in different patterns.

Since the gluing up of the sealed end of the carton entails certain different problems than the gluing up of the open end, and ordinarily different mechanisms would be necessary to perform these operations, it is another object of my invention to provide a single machine which is so designed and constructed that it will glue up both ends of the carton with due regard to the requirements of gluing the different ends.

It is also an object of my invention to provide novel means for distributing the heavier bead of glue on the carton, and for placing the bead in a predetermined pattern of glue application on the carton. With this object in mind it is a further object of my invention to insure that no glue or bead of glue is placed on the carton except in the desired places.

Additional objects comprise the provision of means for insuring a better bond of the adhesive, and the provision of means whereby the entrance of the glue into the joints to be sealed is facilitated.

These and other objects of my invention which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts, of which I shall now describe a preferred embodiment. Reference is now made to the drawings, which form a part hereof:

Figure 1 is a perspective view of the open end of a carton in connection with which I have described my invention.

Fig. 2 is a diagrammatic view in perspective, showing generally the movement of the partially finished carton through my machine.

Fig. 3 is a front elevation of my machine.

Fig. 3*a* is an elevation of one of the cam wheels.

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3.

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 3.

Fig. 6 is a fragmentary plan view of the guide rails.

Fig. 7 is a plan view of one of the carton supporting blocks used for supporting the carton during the bottom sealing operation.

Fig. 8 is a plan view of one of the carton supporting blocks used for supporting the carton during the top sealing operation.

Fig. 9 is a vertical section taken on the line 9—9 of Fig. 3.

Briefly, in the practice of my invention, I take a partially finished carton, such as is shown in various stages of completion in Fig. 2, and finish the same except for sealing the open end, so that the carton is ready for filling. The carton is preferably of rectangular cross section, having four end flaps at each end. The bottom flaps are of conventional design, but the flaps at the top are somewhat different. In Fig. 2, 1 represents the carton body, having bottom flaps 2*a* and 2*b*, and top flaps 3*a*, 3*b*, and 3*c*. In the completed carton, the top flaps 3*b* are folded down, the flap 3*a* is folded down upon the flaps 3*b* and glued to them, and finally the flap 3*c* is bent on the line 3*d* and partially glued to the top of the flap 3*a*. The bottom flaps 2*b* are then folded inwardly, and then the flaps 2*a* are folded down upon them and glued to them and to each other. The top of the finished carton is shown in Fig. 1, where it is ready for filling.

Generally speaking, my machine comprises a series of supporting blocks of two kinds, arranged to travel past the glue wheels in alternating sequence. One kind of supporting block is for supporting the carton for the top gluing operation, and the other kind is for supporting the carton for the bottom gluing operation. These blocks will be described in detail later, and are not shown in Fig. 2. In the interest of clear understanding, I shall now describe the travel of

the carton through the machine, describing the operations performed upon it without at this time describing the parts of the machine itself.

The carton 1 is shown initially entering the machine at the position B in Fig. 2. It will be noted that the top of the carton is upward, and is glued first. After passing the glue rolls, the carton appears as shown at D, and it will be noted that a film of adhesive has been applied covering the flap 3a, and that heavier beads of adhesive have been applied at 4a and 4b. The beads 4a are placed at the ends of the crease connecting the flap 3a to the carton body, and these beads when set, effectively prevent leakage. The bead 4b is noted to extend the length of the carton top, having the same effect at its ends as the beads 4a. The reason that the bead is continuous across the carton, is that there is a scored line of fold extending longitudinally across the flap 3c and adhesive is applied only to the inner narrow portion of the flap 3c, and it would not be adequately held to the flaps 3b by two beads like those shown at 4a. The carton then continues through the machine, the flap 3a is folded down and glued to the flaps 3b, and then the flap 3c is glued to the flap 3a, the adhesive being applied to this flap only on the inner portion bounded by the score line 3d.

From this position, the carton passes around the machine to the point of entrance, where it is removed from its support, inverted, and placed upon an alternately succeeding support which is designed to hold the carton during the bottom sealing operation. The carton is shown in this position at A, with the non-adhesive coated portion of the flap 3c folded down at an angle to the secured portion of this flap. After passing the glue rolls in its second trip therepast, the carton appears as shown at C in Fig. 2. Here it will be noted that a film of adhesive has been applied to both flaps 2a, and that heavier beads of adhesive have been applied as before. In this instance it would not be necessary to provide for the continuous bead 4b, and two small beads, as shown at 4a, would be adequate. Since the continuous bead only increases the effectiveness of the seal at this end of the finished carton, and since by gluing the carton in this manner I am enabled to use the same machine for gluing up both ends of the carton, I prefer to use the continuous bead on one side of the bottom even though it is not essential. In other words, an effective seal could be made of both flaps 2a with beads such as are indicated at 4b. The carton then passes on and the flaps are folded down and firmly secured. At a further point along the machine, the finished carton is automatically removed from its support and falls into a chute for finished cartons.

Having now generally described my machine and its functions, I shall proceed to a more detailed description of its various parts and mechanisms. The machine generally is of a construction which is well known in the art, and comprises a sprocket chain moving in an oval path in a horizontal plane. The chain is indicated at 5, and has attached to it at intervals the supports 6 for the blocks 7 and 8. The supports 6 are provided with tongues 9, which move in guide slots 10, all as is well known. The blocks 7 are of conventional form i. e., rectangular, provided with stop means 11 to insure proper location of the blank upon them, and are preferably made hollow for the purposes of reducing weight and cost. These are the blocks upon which the cartons are first placed for the top gluing operation.

The blocks 8 are of novel design, and comprise the upright members 12 which are preferably also hollow, and which are shaped to fit in the opening remaining in the top after it has been glued in place. Certain modifications were necessary on these blocks, inasmuch as there was not the intimate contact with the carton throughout the length of the block. I have provided a platform 13, upon which a portion of the top of the carton is adapted to rest. Referring to Fig. 1, the carton top 3a, is supported by this platform 13. The outer, unsealed, angularly folded portion of the flap 3c extends downwardly through the space indicated at 13a in Fig. 8. A guide plate 14, which extends from the platform 13 substantially to the top of the carton, in co-operation with an opposed short guide plate 15, serve to hold the carton in a steady position while it passes through the machine. A bar 16, which is screwed to the members 17, which in turn are screwed to the platform 13, serves to support the outer surface of that portion of the flap 3c which is sealed down and which extends from the fold line 3d to the corner of the carton top, thereby insuring a thorough bond at that portion.

As the carton, mounted upon its supporting block, enters the machine, its upper end passes between the guide rails 18. These rails are spaced so as not to grip the carton tightly, and therefore means must be provided to insure a sharp outward bend of the flaps 2a at the bottom of the carton, or the flaps 3a and 3c at the top of the carton, depending on which end of the carton is being sealed. To this end, I have provided a pair of pressure rails 19, which are pivotally mounted at the points 20 upon the rails 18, and spring pressed toward each other by any well known adjustable arrangement, such as I have indicated generally at 21. It is to be noted by reference to Fig. 3, that the pressure rails 19 are so disposed with respect to the other parts of the machine that they exert their pressure upon the carton at the time when the flaps 2a, or the flaps 3a and 3c, as the case may be, are being spread out by the spreader plate 22. By these means a good angular fold is assured between the flaps 2a and the carton body in one case, and the flaps 3a and 3c in the other.

The leading flap 2b or 3b, respectively, will readily be folded down as the carton passes the spreader palte 22. In order to insure that the trailing flap 2b or 3b, respectively, is properly folded down under the said spreader plate, I provide a tucking member 23, the operating mechanism of which I shall describe later. The carton thus passes the glue rolls, and upon emerging on the other side thereof, continues under a hold-down bar 88, which is located between the glue rolls and serves to hold the flaps 2b and 3b in the position shown in Fig. 2. The hold-down bar 88 terminates abruptly at 89, permitting the flaps 2b and 3b to spring upward momentarily under the influence of their natural resiliency. Shortly thereafter, a second hold-down bar 90 presses these flaps down again. This upward and downward bending of the flaps assists the glue in working thoroughly down into the corner joints of the carton. The turn-over plates 24 and 25 then fold the flaps 2a or the flaps 3a and 3c, as the case may be, into bending position. While the flaps are being folded over by the members 24 and 25, a blast of air from the pipe 91 plays upon the adhesive covered surfaces, causing the adhesive to set more rapidly and produce a better bond. The blast is gen-

erated by a conventional blower, indicated generally at 92 and conveniently mounted on the machine frame. The flaps are then maintained in bonding relation by means of the pressure belt 26. The operation described in the last two paragraphs is the same, regardless of which end of the carton is being glued up. On the other side of the machine, which is not shown since all the parts thereof are well known in the art and form no part of this invention, the cartons on the blocks 7 pass along under pressure rolls or belts until they return to the front, whereupon they are removed from the blocks 7, inverted and placed upon a succeeding block 8. It will be noted that the latter are provided with inclined conduits 27, which connect with the bores 28 of the members 12. As the blocks 8 pass around the rear portion of the machine, the open end of the conduits 27 come into registry with a blower, whereby the finished cartons are removed from the blocks and pass from the machine.

I will now pass to a description of the glue wheels and their connected mechanisms. The glue wheels are indicated at 29 and 30, and are mounted on a shaft 31. These glue wheels are driven from the shaft 32 by means of the chain 33 and the sprockets 34 and 35, while the shaft 32 is driven from the shaft 36 by means of the bevel gears 37 and 38. The shaft 36 is connected to a motive means which drives this shaft in timed relation to the chain 5, which carries the carton supporting blocks. Backing rollers 37 are provided for the glue rolls, and serve to press the flaps to be covered with adhesive against the glue rolls. The rollers 37 are mounted on lever arms 38, which are pivoted at 39, and the rod 40, which is pivoted to the other end of the arms 38, connects them to cam means (not shown), whereby the rollers are brought into backing relationship to the glue rollers only while a carton is being glued up, so that no glue will get onto the backing rollers where it would make the backs of the flaps being glued, sticky.

From what has already been said, it will be seen that both the flaps 2a are to be covered with a film of adhesive, while only the flap 3a at the top of the carton is to be so covered. The flap 3c is coated with the heavy bead of adhesive up to the fold line 3d so that no further previous coating is necessary. For this reason, means are necessary whereby one of the glue rolls may function each time a carton passes under it, while the other glue roll must only function, as far as thin film application is concerned, on alternate cartons, so as not to apply a thin film to the entire surface of the flap 3c. The shaft 31, which carries the glue rolls, is mounted in extensions 41 of the glue reservoirs 42. A portion of the glue reservoirs is cut out to admit approximately a quadrant of the glue rolls. Also mounted in the glue reservoirs are the shaft 43 and 44, one in each reservoir, which carry scrapers 45 and 46, which bear against the glue rolls 29 and 30, respectively. By oscillation of the shafts 43 and 44, glue may be admitted to portions of the surfaces of the rolls at appropriate times. Levers 47 and 47a are attached to the shafts 43 and 44, respectively, by means of set screws and are urged upwardly so as to hold the scrapers against the glue rolls by means of springs 48, the other ends of which are fastened to studs 49 mounted on the glue reservoirs. A shaft 50 extends transversely of the machine, and carries a lever 51 fastened to it so as to be rotated upon rotation of the shaft. The end of the lever 51 is bent over at a right angle as at 52 to provide a support for the adjustable stud 53, which in a clockwise oscillation (as seen in Fig. 3), depresses the lever 47 and permits a flow of adhesive onto the surface of the roll 29. The shaft 50 is rocked by the following mechanism: Suspended from a stub shaft 54, mounted in a bracket 55 on the side of the machine, is a weighted member 56 provided with a cam surface 56a; each of the supporting blocks 7 and 8 carries a stud 57 adapted to contact and elevate the weighted member 56 to the position shown in Fig. 3; a spring 58 is provided to assist in the return to its vertical position of the member 56; also fastened to the shaft 54 so as to move therewith is the lever 59 which, upon elevation of the weighted member 56 is adapted to exert a downward pull on the rod 60, which is made adjustable as shown generally at 61; the upper end of the rod 60 is pivotally fastened to a lever 62 which is fastened to the shaft 50. It will thus be seen that when one of the studs 57 actuates the weighted member 56, the scraper 45 is retracted from the roll 29 by means of the linkage above described, whereby the roll may become coated with the adhesive.

The scraper 46 for the glue roll 30 is similarly actuated, with only the differences which I shall now point out. The weighted member 56 for this portion of the mechanism is actuated by the studs 57a, which are found only on the blocks 8, so that glue is only applied to the roll 30 when a block 8 is passing thereunder, which is the case when the bottom end of the carton is being glued. In this case, also, the member 51a, which corresponds to the lever 51, is loosely mounted upon the shaft 50, whereby the scrapers 45 and 46 may be actuated independently and without interference.

Next, I shall describe the means by which the heavier beads of glue are applied, and again I shall first describe the mechanism in connection with the glue roll 29, later pointing out the differences which obtain in connection with the mechanism for the roll 30. The scraper 45 is provided near its inner end with a notch 63, which is adapted to be closed by the end of a rod 64, which is slidably mounted in lugs 65 on the side wall of the reservoir 42. Mounted on a pin 66 in the side wall of the reservoir is a lever 67, the other end of which carries a pin 68, which rides in a slot 69 in the lever 70, which is loosely held in place on the shaft 71 by collars. The lever is actuated by a link 72, which is pivoted to it at a point intermediate of the slot 69 and the shaft 71. The other end of the link 72 carries a stud 73, by which it is attached to the link 74, the other end of which is loosely held in position on the shaft 75 by the collars 76. The stud 73 also carries a roller 77, which is adapted to ride on a cam wheel 78, and a spring 79 fixed to the frame at one end, and attached to the lever 70 at the other, tends to urge the roller 77 against the cam wheel 78. The cam wheel 78 is mounted upon the shaft 32 so as to turn therewith, and is provided with two risers 80, which are adjustably mounted thereupon. It will be noted that the end of the rod 64 is bent over as at 64a, this bend being adapted to lie behind the lever 67, and being urged thereagainst by the small spring 64b, the other end of which is fastened to a stud 67a on the lever 67. It will thus be seen that during each revolution of the cam wheel, and because of the sprocket connection, for each revolution of the glue wheel 29, the rod 64 will be retracted from the notch 63 twice, whereby the beads 4a are formed.

The mechanism for actuating the rod **64** for the glue wheel **30** is only slightly different from that described above. In this case the cam wheel **78** is provided with a single riser **81**, which extends around the cam wheel a distance equivalent to that from the beginning of the first riser **80** to the end of the second riser **80** on the cam wheel for the glue wheel **29**. Thus the rod **64** for the glue wheel **30** is retracted to make one long bead as shown at *4b* in Fig. 2, while the two beads *4a* are being formed by the other rod **64**. In this case, also, the lever **70***a*, which corresponds to the lever **70**, is fixed to the shaft **71**, and is not directly connected to its link **72**. The connection in this case is through a short lever **82**, which is also fixed to the shaft **71**, and which corresponds to the upper portion of the lever **70** from the pivot **71** to the connection with the link **72**.

Also mounted upon the shaft **32** is a cam wheel **83** (Fig. 4) which is provided in one of its faces with a non-circular cam groove in which a pin on the link **84** is adapted to ride. The other end of the link **84**, as shown in Figure 3, is pivotally connected to one arm **85** of a bell crank member which is pivotally mounted on the frame of the machine at **86**. The other arm **87** of the bell crank member bears the tucking member **23**, the function of which was pointed out earlier in the specification.

It is to be understood that different forms of my preferred embodiment may be made without departing from the spirit of my invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine for gluing end flaps of paper cartons, a pair of glue rolls, an adhesive supply for feeding adhesive onto said rolls, means to permit the feeding of adhesive onto either of said rolls independently, or onto both of said rolls concurrently, according to a predetermined pattern of glue application, comprising means to regulate a normal film of adhesive over the main surface of said rolls and means for regulating an abnormally heavy film on predetermined portions of said rolls.

2. In a machine for gluing end flaps of paper cartons, a supporting block for holding a carton portions of an end of which has been sealed and in which an aperture remains which is coverable by a flap, said block being shaped to fit within said aperture and support the other end of said carton for gluing, a platform upon which the inverted top end of the carton is adapted to be supported, an aperture in said platform for the reception of said last named flap, and guide means extending upwardly from said carton and adapted to hold said carton rigidly in position upon said block.

3. A machine for gluing end flaps of a paper carton having an aperture in the top which is closable by a hinged flap, comprising endless conveyor means, supporting blocks for said carton upon said conveyor, said blocks having two different forms, one having a standard form for supporting a carton for the top sealing operation, and the other having a form shaped so as to extend through an opening extending through a carton end and being provided with means for supporting the carton flaps at the opposite end of the carton during the sealing operation.

4. In a machine of the class described, having a glue roll and a retractable scraper therefor, a notch in said scraper to permit a heavier flow of adhesive therethrough, and means to partially block the flow of adhesive therethrough at definite intervals according to a predetermined pattern of proposed glue application.

5. In a machine of the class described, having means to hold down the leading and trailing end flaps of a carton during the gluing operation, and means for applying adhesive in a predetermined pattern to side end flaps of said carton so that beads are applied adjacent corner crevices of said flaps, means to interrupt the holding down of said first named flaps momentarily and permit said flaps to spring upwardly of their own resiliency to work the heavier beads of adhesive down thoroughly into the corner crevices, for the purpose described.

6. A machine for gluing end flaps of paper cartons, comprising endless conveyer means and bending means, pressure means in cooperative relation with said bending means, hold down means for the leading and trailing end flaps, means for applying adhesive in predetermined patterns to side end flaps of paper cartons so that beads are applied adjacent corner crevices of said flaps, and means to interrupt the holding down of said first named flaps momentarily and permit them to spring upwardly of their own resiliency, so as to press the heavier beads of adhesive down thoroughly into the corner crevices.

7. In a machine for gluing end flaps of paper cartons, a pair of glue rolls, a reservoir for adhesive, a pair of scrapers for controlling the flow of adhesive to said rolls, notches in said scrapers, means to block the flow of adhesive through said notches, and means to control the functions of the scrapers and notches independently each of each other.

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