May 22, 1934. M. J. MILMOE 1,960,228

GLUE APPLYING APPARATUS

Filed Feb. 1, 1932 6 Sheets-Sheet 1

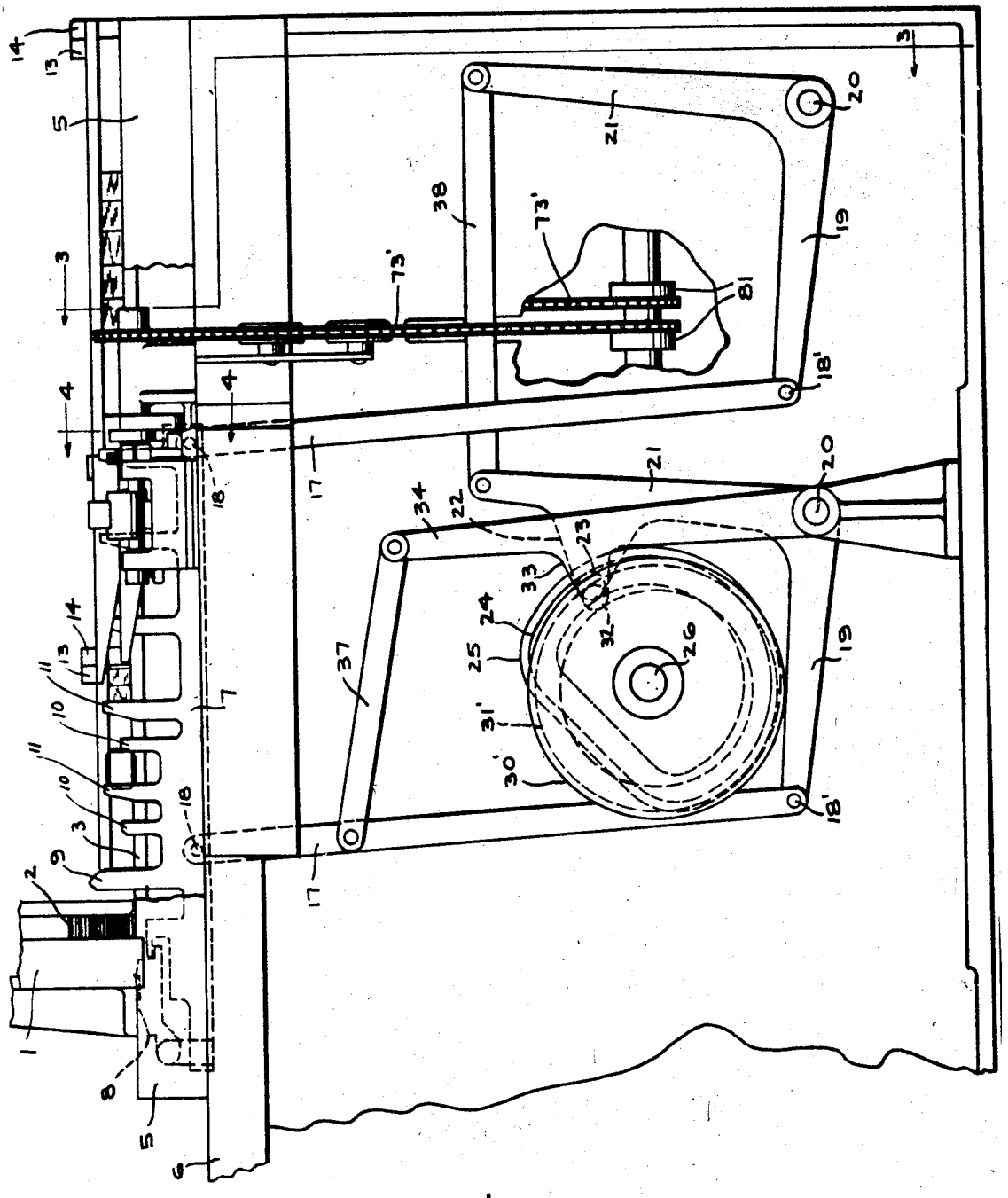


FIG. 1

INVENTOR.
Michael J. Milmoe
BY Reeves, Cox & Moore
ATTORNEYS.

May 22, 1934. M. J. MILMOE 1,960,228

GLUE APPLYING APPARATUS

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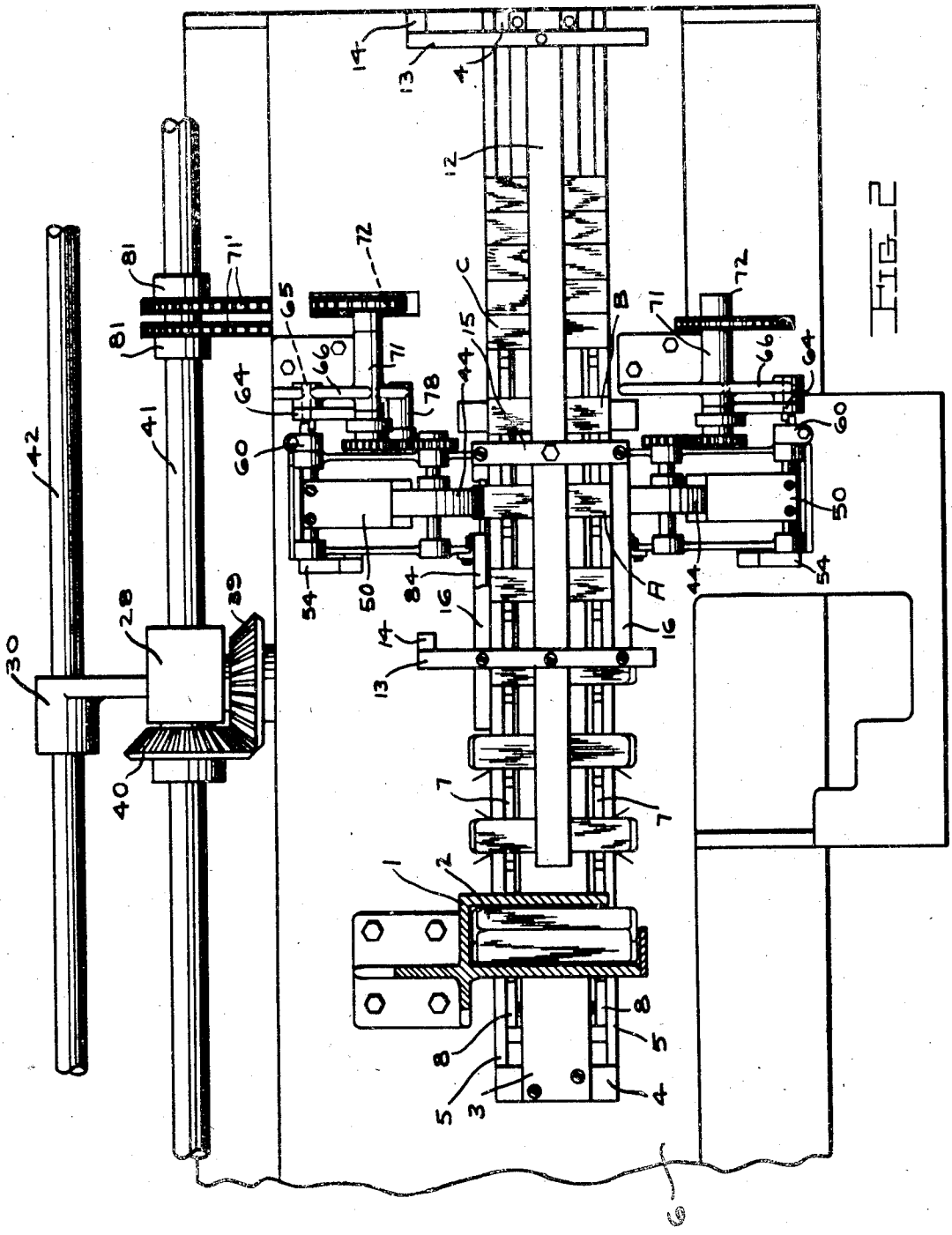


FIG_2

INVENTOR.
Michael J. Milmoe
BY Cleaver, Cox & Moore
ATTORNEYS.

May 22, 1934. M. J. MILMOE 1,960,228

GLUE APPLYING APPARATUS

Filed Feb. 1, 1932 6 Sheets-Sheet 3

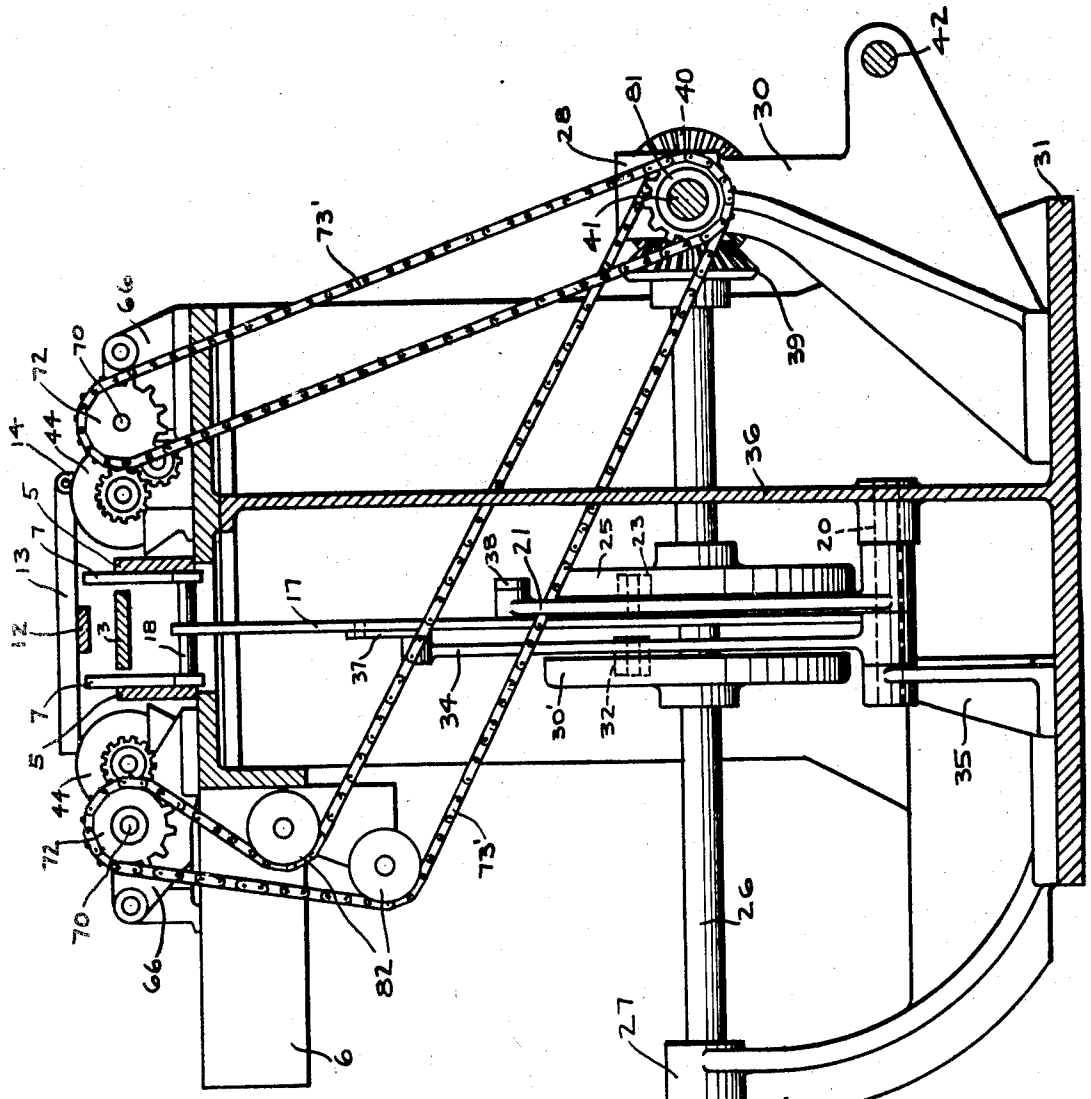


FIG. 3

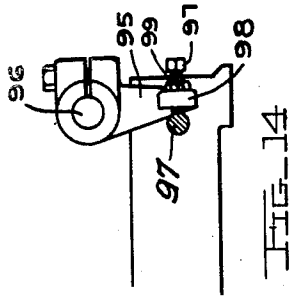


FIG. 14

INVENTOR.
Michael J. Milmoe
BY Cheever, Cox & Moore
ATTORNEYS.

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GLUE APPLYING APPARATUS

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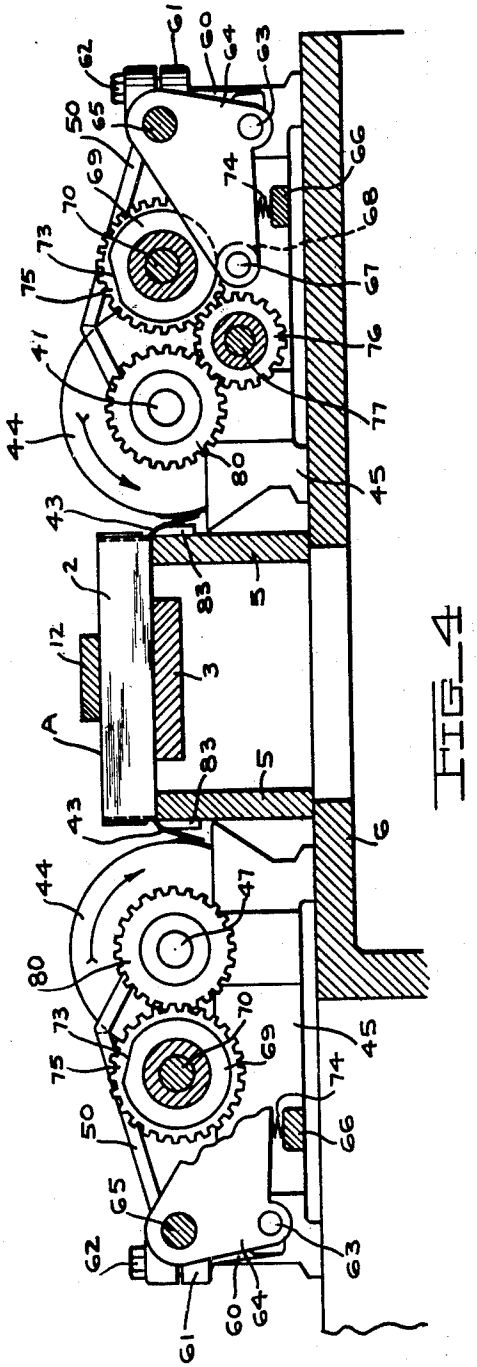


FIG. 4

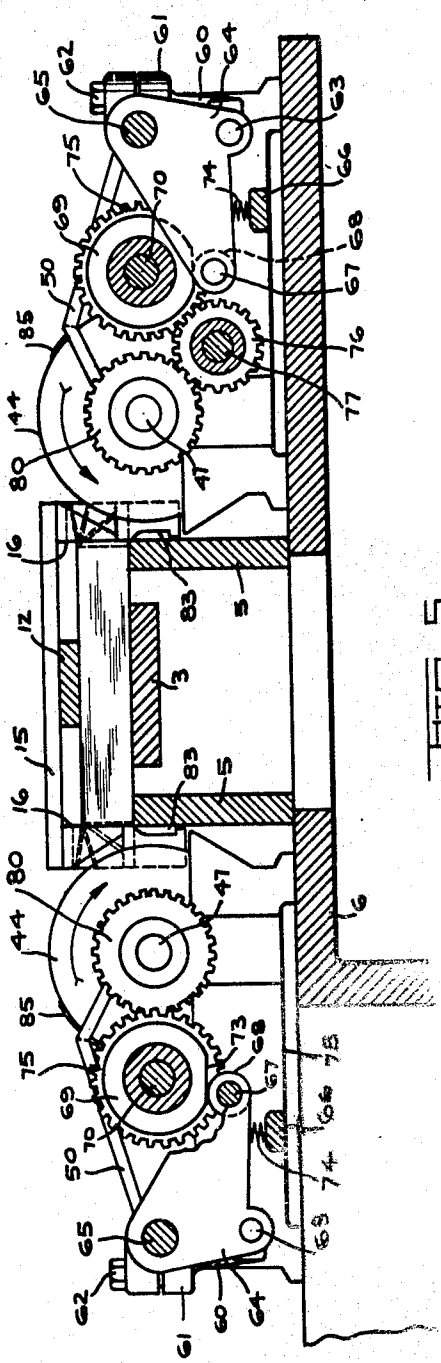


FIG. 5

INVENTOR.
Michael J. Milmoe
BY Cheever, Cox & Moore
ATTORNEYS.

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GLUE APPLYING APPARATUS

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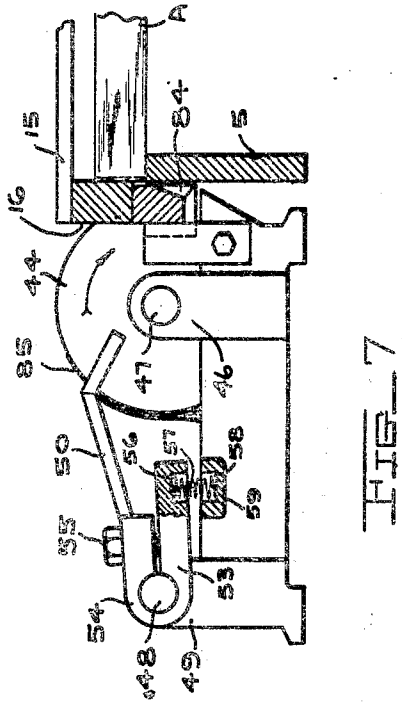


FIG. 7

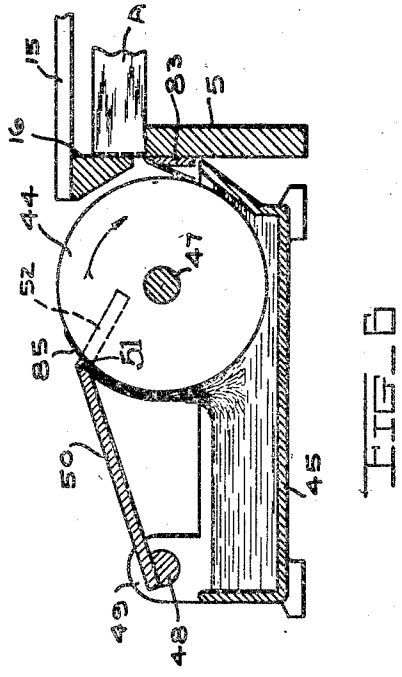


FIG. 6

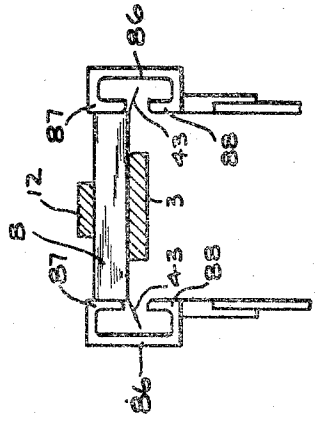


FIG. 10

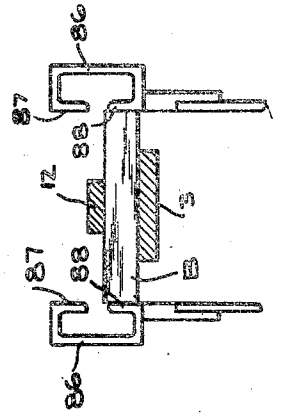


FIG. 9

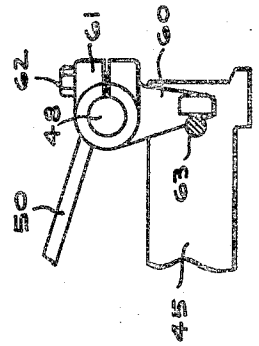


FIG. 8

INVENTOR.
Michael J. Milmoe
BY
Cheever, Cox & Moore
ATTORNEYS.

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GLUE APPLYING APPARATUS

Filed Feb. 1, 1932 6 Sheets-Sheet 6

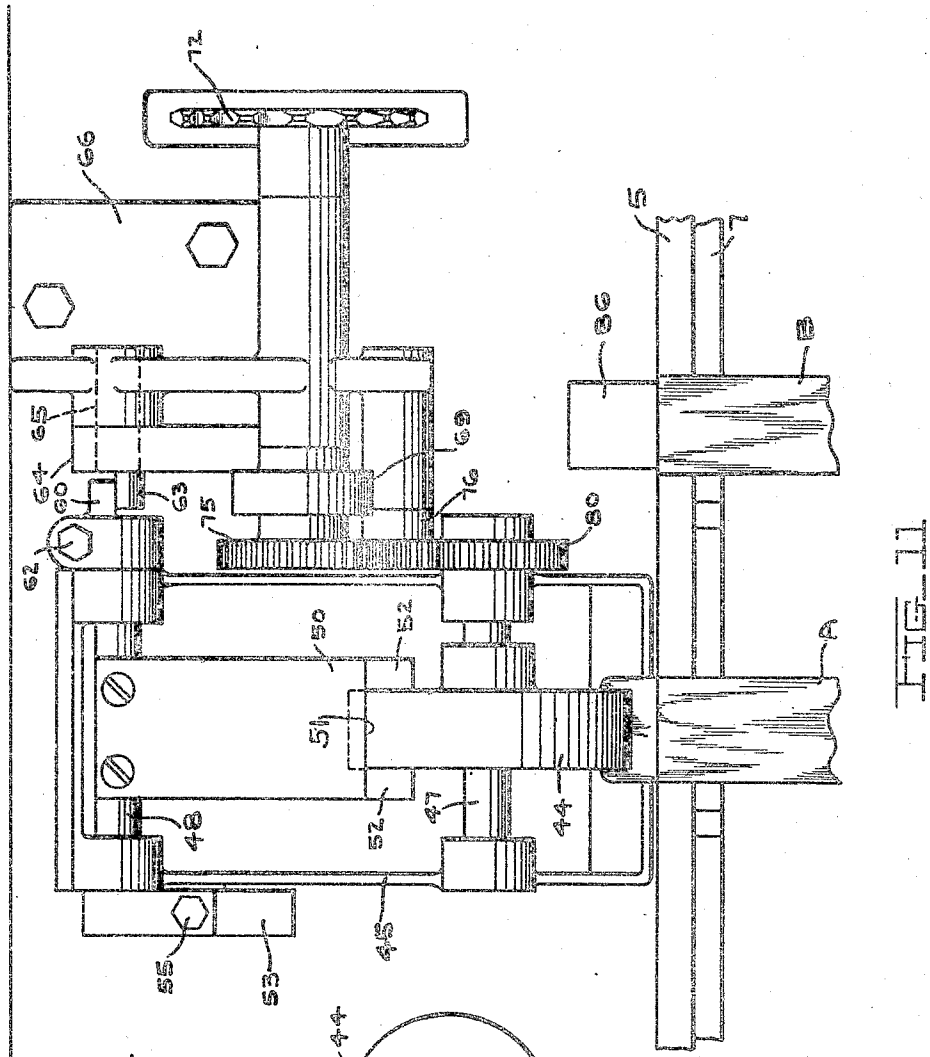


FIG. 11

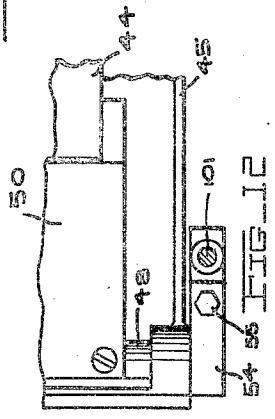


FIG. 12

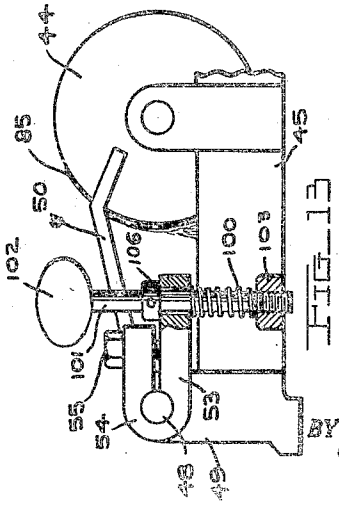


FIG. 13

INVENTOR.
Michael J. Milmoe
BY Reeves, Cox & Moore
ATTORNEYS.

Patented May 22, 1934 1,960,228

UNITED STATES PATENT OFFICE

1,960,228

GLUE APPLYING APPARATUS

Michael J. Milmoe, Glen Ellyn, Ill., assignor to F. B. Redington Co., Chicago, Ill., a corporation of Illinois

Application February 1, 1932, Serial No. 590,062

15 Claims. (Cl. 91—51)

The present invention relates to wrapping machinery and particularly to glue applying mechanism for applying glue to certain desired parts so that the wrapper may be properly sealed. The invention is shown as applied to a machine in which cardboard cartons are provided with flaps which are folded in overlapping relation with each other and one of the flaps is provided with glue on one surface thereof so that the same may be sealed over others of the flaps to hold all of the flaps in sealed position. However, my invention is not necessarily limited to cartons having flaps, but is applicable to other types of wrapping in which glue is applied to a part during the wrapping process.

This application is a continuation in part of my application Serial No. 356,933 filed April 22, 1929 for new and useful improvements in carton filling machines.

One object of this invention is to provide an improved apparatus for applying glue to the desired parts, in the present instance these parts being the flaps of the cartons.

Another object of this invention resides in the novel means for preventing the accumulation of dried glue on the glue applying apparatus, thereby insuring a more uniform application of the glue to the flaps.

Another object of this invention is to provide a rotatable glue applying device for applying the glue in predetermined quantities to the flaps of the cartons. More particularly this rotatable member takes the form of a roller to the surface of which the glue is applied and in which means is provided for regulating the thickness of the film of glue on the glue applying roller.

More specifically, my invention has for its object the provision of means for insuring that only a predetermined quantity of glue will remain on the surface of the glue applying roller at a predetermined portion of the surface of said roller.

Other objects of this invention will appear hereinafter as the description thereof proceeds, the novel arrangements and combinations being clearly set forth in the appended claims.

Referring now to the drawings

Fig. 1 represents a front elevational view of a portion of the machine embodying my invention and showing the glue applying apparatus in elevation;

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

Fig. 3 is a section taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a section taken substantially along the line 4—4 of Fig. 1 with parts of the apparatus broken away for the sake of clearness;

Fig. 5 is a view similar to Fig. 4 showing the parts in a different position of adjustment than illustrated in Fig. 4;

Fig. 6 is a vertical section through one of the glue applying mechanisms, the particular glue mechanism being that shown at the right in Fig. 3 and looking in the direction from left to right in Fig. 1;

Fig. 7 is a view of the side of the glue applying mechanism shown in Fig. 6 with various parts of the actuating means thereof removed for the sake of clearness;

Fig. 8 is a fragmentary view of a portion of the glue applying apparatus shown at the right in Fig. 3;

Figs. 9 and 10 are views of the folding means for folding the glued flaps against the other flaps;

Fig. 11 is an enlarged plan view of one of the glue applying mechanisms;

Fig. 12 is a fragmentary plan view showing a modified adjustable member for adjusting the position of the scraper;

Fig. 13 is a side elevation of the device illustrated in Fig. 12; and

Fig. 14 is a fragmentary side elevational view of the device seen in Fig. 13 and looking from the rear in Fig. 13.

Referring now to the drawings, it is seen in Figs. 1 and 2 that there is a hopper 1 containing a stack of unopened cartons 2 which rest on the support 3 extending longitudinally of the machine from left to right and supported by the supports 4 which in turn are carried by the side rails 5 on the frame 6 of the machine. The frame 6 is open between the side rails 5 for a purpose which will appear presently.

Arranged between the support 3 and the adjacent portions of the side rails 5 are a pair of bars 7 which form a transport member for transporting the cartons from the hopper 1 to successive positions along the support 3. The transport members are connected at their ends by suitable tie members and that tie member at that end adjacent the end of the hopper carries a device designated generally as 8, for stripping the cartons from the hopper and feeding the same to an initial position on the support 3. This means is more fully described in my aforementioned application and no further description thereof is thought to be necessary in order to adequately describe the invention being claimed. The transport members 7 are provided with projections 9, 10 and 11, which projections assist in conveying

the cartons along the support and also assist in opening the cartons. The means for opening the cartons is more specifically set forth in my aforementioned application.

As the cartons are carried along the support 3 by the projections 9, 10 and 11, there is some tendency for the same to return to the shape which they occupy in the hopper 1 and in order to keep the cartons open I provide a presser bar 12 carried by a plurality of arms 13 pivoted at 14 to the frame 6. The presser bar 12 is also provided with a cross piece 15. One of the arms 13 and the cross piece 15 carry folding members 16 which fold corresponding flaps at opposite ends of the carton into folded position over the ends of the cartons. The particular mechanism for folding the flaps of the cartons is not important to the present invention, it being sufficient to state that the flaps at each end are folded into compacted position against the end of the carton with the exception of one flap to which the glue is to be applied. The glue is then applied to this flap and the flap folded against the other flaps to complete the package. The cartons therefor are fed intermittently along the support 3 until they arrive at the glue applying position indicated by A in Fig. 1. At this position the carton comes to rest and the glue is applied to the inside surfaces of the flaps. The transport members 7 are carried by parallel arms 17 pivoted to rods 18 which are secured to both of the transport members. The arms 17 are pivoted at 18' to arms 19 of bellcranks pivoted at 20. The bellcranks have the upwardly extending arms 21, one of which is provided with a projection 22 carrying a roller 23 engaging the cam groove 24 of a cam 25 secured to the cross shaft 26 mounted in bearings 27 and 28 in the brackets 29 and 30 provided on the front and rear of the machine respectively and secured to the base 31 thereof. A cam 30' also secured to the shaft 26 has a cam groove 31' therein in which the roller 32 is adapted to travel. This roller 32 is carried by a projection 33 on the arm 34 pivoted to the shaft 20. The shaft 20 is supported by the bracket 35 and the upstanding web 36 of the frame. The upper end of the arm 34 is connected by a link 37 to the arm 17. The arms 21 of the bellcranks are connected by means of the link 38 so that they will move in unison with each other.

The operation of this mechanism is as follows: The cam 24 is adapted to oscillate the bellcranks and cause upward movement of the arm 17. The cam 30' is adapted to oscillate the arm 34 and cause lateral movement of the arms 17. Since the cams 25 and 30' are operating at the same time there is a combined effect on the transport member 7. This combined effect is one which causes the transport member 7 to move first to the right to carry the cartons along the support 3 and strip the next carton from the bottom of the stack 2 in the hopper 1. The next movement is a downward movement so that the upper ends of the projections will be moved below the supporting surface of the support 3. The next succeeding movement is a movement of the transport members to the left and the final movement causes the transport members to move upward again into the position illustrated in Fig. 1 so that the cycle of operation of the transport members may be repeated.

The cross shaft 26 is driven by means of the bevel gears 39 and 40 mounted on the cross shaft 26 and the main drive shaft 41 respectively. The main drive shaft 41 is mounted to rotate in the bracket 30 and in other brackets spaced along the base 31, but not illustrated in these drawings, as their construction does not form any part of this invention. The bracket 30 also supports a shaft 42 upon which various arms are mounted for actuating other parts of the mechanism not disclosed in these drawings, but disclosed in my aforementioned application.

As already stated, when the cartons reach the position A, the flaps are all folded with the exception of one flap at each end of the carton. In Fig. 4 these flaps are indicated by the reference numeral 43 and are shown extending downwardly with their inner surfaces facing outwardly. While the flaps are in this position the glue is applied to the outwardly facing portions thereof. This glue applying mechanism is illustrated quite clearly in Figs. 4, 5, 6, 7 and 11 while driving means therefor is best illustrated, perhaps in Figs. 1, 2 and 3.

I will describe only one of the glue applying means as it will be understood that the other is constructed in substantially the same manner, except that the glue applying mechanism shown at the right in Fig. 4 is provided with a reversing gear to cause both of the glue applying rollers 44 to rotate in opposite directions. The glue applying trough 45 has bearings 46 for supporting the shaft 47 of the glue applying roller 44. The glue applying trough also has a shaft 48 pivoted in bearings 49 at one end of the trough and this shaft carries a scraper 50 (see particularly Figs. 6 and 11) having an edge 51 thereof adapted to engage the surface of the roller and having projections 52 arranged on the opposite sides of the roller 44 for engaging the opposite sides thereof to scrape the excess glue therefrom so that the surface of the roller will be free from glue, except at desired peripheral portions thereon. The scraper is normally arranged with the edge 51 in contact with the periphery of the roller, but is periodically raised for a fraction of the revolution of the roller so that the glue will remain on the periphery of the roller at a predetermined point thereon. I will now proceed to describe this mechanism and the means for actuating the rollers.

The shaft 48 carries an arm 53 at one end thereof and outside of the glue applying trough 45. This arm 53 has a split bearing 54 so that the same may be securely attached to the shaft 48 by means of the clamping screw 55. The end of the arm 53 has a recess 56 adapted to receive the spring 57, the other end of the spring being arranged within the recess 58 in a projection 59 on the side of the glue trough 45. It is therefore clear that the spring normally urges the shaft 48, as viewed in Fig. 7, in a counter-clockwise direction, thereby lifting the scraping edge 51 out of engagement with the surface of the roller. Means is provided, however, for preventing this movement, except at predetermined times during the rotation of the roller. This means is perhaps best illustrated in Figs. 1, 4, 5, 8 and 11. An arm 60 having a split sleeve 61 arranged over the shaft 48, and a clamping nut 62 for securing the sleeve to the shaft is adapted to abut against a pin 63 mounted on the arm 64 pivoted to the shaft 65 mounted in the bearing bracket 66 secured to the upper part 6 of the frame of the machine. The arm 64 also has a shaft 67 secured thereto and there is a roller 68 rotatably mounted on this shaft. The roller 68 engages the cam 69 secured to the shaft 70 which is rotatably mounted in the bearing 71 in the

bracket 66 and has a sprocket 72 (see particularly Fig. 3) secured thereto at the other end thereof. The cam 69 has a flat portion 73 and the remaining portions of the cam are equi-distant from the center of rotation thereof. A spring 74 normally urges the arm 64 in a direction to bring the roller 68 into engagement with the periphery of the cam 69.

A gear 75 is also secured to the shaft 70 and rotates therewith. This gear meshes with an idler gear 76 secured to the shaft 77 rotatably mounted in the bearing 78 on the bracket 66 and this idler in turn meshes with a gear 80 secured to the shaft 47 to which the glue applying roller 44 is secured. The idler 77 is omitted in the arrangement shown at the left in Fig. 4 and the gears 75 and 80 are directly in mesh with each other to cause the glue applying rollers 44 to rotate in opposite directions when the shafts 70 are rotated in the same direction.

The gear 75 has one more tooth thereon than does the gear 80. With this arrangement the glue applying roller rotates fully more than one complete revolution each time the gear 75 is rotated through one complete revolution and the gear 75 is adapted to be rotated once for each rotation of the cam shaft 26, or once between the presentation of one carton and the presentation of the next succeeding carton to a mechanism which will be described presently.

The sprockets 72 have chains 73' trained thereover and over the sprockets 81 on the main drive shaft 41. The chain 73' at the left in Fig. 3 is also trained over idler pulleys 82. The sprockets 81 and 72 are the same size so that one complete rotation of the shaft 41 will cause one complete rotation of the shafts 70 and slightly more than one complete revolution to the glue applying wheels 44.

While the flaps are having the glue applied thereto the same rest against the abutments 83 (see particularly Fig. 4) and these abutments tend to throw the flaps in the direction of the rollers 44. Prior to the arrival of the flaps opposite the periphery of the glue applying rollers, the same are held downwardly in a substantially vertical plane by the folding members 84 (see particularly Fig. 7) and are released when opposite the glue applying rollers so that they may be thrown into engagement with the periphery thereof.

The operation of this device is as follows: The cartons are successively positioned at the glue applying position and the flaps thrown outwardly toward the periphery of the rollers 44. Each of these rollers is driven by the gearing previously described and in a direction towards the carton and downwardly on the side of the rollers adjacent the carton. As the shaft 70 rotates, the flat portion 73 periodically comes opposite the roller 68 and the spring 74 moves the arm 64 upwardly to rotate the shaft 65 about its pivot and through the intermediacy of the parts 60, 61, 62, and 63 lift the scraper 50 to bring the scraping edge 51 out of engagement with the periphery of the roller and thus permit a small quantity of glue 85 to remain on the periphery thereof. The scraper is again pulled down against the periphery of the roller as soon as the flat spot is out of engagement with the roller 68 and as a result, the remaining portion of the periphery is scraped free of the glue until the flat portion 73 again arrives adjacent the roller 68.

Now since the gear 75 has one more tooth than the gear 80, the roller 44 will rotate more than one complete revolution for each revolution of the shaft 70 and as a result each time the scraper is raised, the glue 85 which is permitted to remain on the periphery of the roller is on a different portion of the periphery. This is extremely important in view of the fact that if the glue were retained on the same portion of the periphery at all times, the result would be that all of the glue would not be wiped off from this portion of the periphery by the flaps of the cartons, but instead, a portion of the glue would remain on the periphery of the roller and harden thereon, making successive layers of glue which after a time acquire a thickness sufficient to prevent any fresh glue from passing beneath the scraping edge 51 of the blade. As a result, the glue cannot be applied to the cartons which come along after this layer of hardened glue has been formed on the periphery of the glue applying roller. However, with the arrangement shown in the drawings, all portions of the periphery are scraped by the scraper, except during those few revolutions during which the portion of the periphery is beneath the layer of glue permitted to remain on said roller.

It is obvious that the gear 75 may be provided with 1, 2, 3, 4 or as many more teeth than the gear 80 as may be desired, but the number of gear teeth on the respective gears must be such that all portions of the periphery thereof will be scraped at frequent intervals, to prevent the accumulation of hardened glue on the periphery thereof. Also the gear 75 may have less teeth thereon than the gear 80 and the device would work equally well.

After the glue has been applied to each of the flaps, the transport member carries the carton to its next position at which the flaps are folded against the ends of the carton. The folding means is illustrated in Figs. 9 and 10, but the actutaing means therefor is not illustrated. However, this portion of the mechanism is fully described in my aforementioned co-pending application. The U-shaped members 86 having the inturned flap engaging portions 87 and 88 are arranged with their opposed surfaces substantially in the planes of the ends of the cartons. The flaps 43 (see particularly Fig. 10) pause between the inturned ends 87 and 88 of the members 86 when the carton is moved to the flap sealing position which is designated as B in Fig. 2. The inturned ends 87 hold the flaps which have already been folded against the ends of the carton in the position, and means (not shown) move the members 86 upwardly to bring the inturned ends 88 into engagement with the flaps 43 so that the flaps will be carried upwardly and against the folded flaps with the glue between the flaps 43 and the folded flaps. The pressure of the fingers 88 on the ends thereof secure the flaps against the ends of the carton. If desired, when the cartons are moved to their next position C (see Fig. 2) means may be provided for holding the flaps 43 in position until the glue has "set". However, this is not material to applicant's present invention and no means is shown for this purpose.

Furthermore, the arrangement is such that only the required amount of glue is left on the periphery of the roller. This has the advantage of preventing excess amounts of glue being applied to the flaps of the cartons. The scraper being timed in relation to the movements of the cartons, always insures that the small quantity of glue 85 remaining on the periphery of the roller will always come into engagement with the flap while the flap is at the glue applying position.

It will be noted that by changing the angular position of the arm 53, that the scraper may be moved closer to or farther away from the periphery of the roller 44. This adjustment is used to insure that the scraper will properly engage the periphery of the roller and may be used in case the roller becomes worn or the scraper 50 becomes sprung or perhaps worn. The same result may be accomplished by providing the arm 53 with an adjusting screw such as illustrated in Fig. 14. In this figure, the arm 95 corresponds to the arm 53 in the other figures, and is secured to a shaft 96, similar to the shaft 48. The member 97 corresponds to the member 63 and is carried by an arm similar to the arm 64. A set screw 97' extends through a lug 98 on the arm 95, and this set screw is adjustably held in position by a lock nut 99. The set screw may be adjusted to any desired position, and thereby accomplish the same result as by angularly adjusting the arm 95 about the shaft 96.

In Figs. 12 and 13, I have also shown a means for yieldingly urging the scraper blade 50 in an upward direction and this means is similar to the means shown in Fig. 7 except that it is provided with a stop for limiting the upward movement of the scraper blade 50 to thereby determine the thickness of the quantity of glue 85 which remains on the periphery of the roller 44. The spring indicated by the reference numeral 100 surrounds the shank of a screw 101 provided with a head 102 used for the purpose of rotating the screw to secure an adjustment. The lower end of the screw 101 is threaded into a lug 103 on the side of the trough 45, and has a collar 106 secured thereto near the upper end thereof. The shank of the screw passes through an enlarged opening in the arm 53 and the collar 106 is adapted to engage the arm 53 and limit the upward movement thereof at the time when the roller 68 is opposite the flat portion on the cam 69. In other words, the thickness of the layer of glue 85 which remains on the roller 44 is determined by the adjustment of the screw 101.

It will be obvious that those skilled in the art to which this invention pertains can make other changes in the specific arrangement of the parts shown in the embodiment of my invention shown in the accompanying drawings without departing from the spirit of this invention, and therefore I do not wish to have my invention limited except as set forth in the appended claims.

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

1. A carton filling and sealing machine in which glue is adapted to be applied to some of the flaps on a carton for the purpose of sealing said carton, comprising means for moving said cartons to successive positions in said machine, one of said positions being a glue applying position, gluing mechanism located at said glue applying position comprising a cylindrical glue applying roller adapted to rotate with the periphery thereof in engagement with the flap of the carton located at the glue applying position, means for applying a predetermined amount of glue to one portion only of the peripheral surface of said roller, said portion having the adjacent surfaces of said roller in a peripheral direction on both sides thereof free of glue, and means for regulating said predetermined amount of glue which is to be applied.

2. A device as claimed in claim 1 in which the means for regulating the amount of glue which is to be applied comprises a trough for supplying glue to the entire surface of the roller, and a scraper for thereafter removing all but said predetermined amount of glue from said roller.

3. A glue applying device for carton filling machines comprising a glue roller having the peripheral surface thereof entirely cylindrical, a trough for containing glue, means for supplying glue from said trough to said roller, a scraper adapted to contact with said roller to remove glue from said roller, and a means including a cam for lifting said scraper entirely clear of said roller at predetermined intervals to permit a predetermined amount of glue to remain on said roller at a predetermined peripheral portion of said roller.

4. In a glue applying apparatus for applying glue to an article, the combination with a roller, of means for supplying glue to the periphery of said roller, a scraper for scraping all of the glue from said periphery throughout the entire width thereof before said glue reaches the surface to which glue is to be applied, except at a predetermined position on said periphery, and means for actuating said scraper to move the same out of engagement with said roller to permit said glue at said position to remain on said roller, said scraper being adapted to scrape glue from different portions of said roller during successive revolutions of said roller.

5. In a glue applying device for wrapping machines, the combination with a glue applying roller, of a trough in which said roller rotates, a scraper for scraping glue from the periphery of said roller and urged into contact therewith, and means for periodically raising said scraper from its engagement with said roller for permitting glue to pass therebetween and remain on said roller, said means for raising said scraper periodically being constructed to raise said scraper at different times during different rotations of said roller.

6. A device as set forth in claim 5 in which said scraper is provided with members for engaging other surfaces on said roller at all times to prevent accumulation of glue on said last mentioned surfaces.

7. A glue applying device for applying glue to the flaps of cartons in a carton machine comprising a glue trough, a roller journaled so that a portion of its periphery will travel in the glue carried by said glue trough, gearing for driving said roller so that different portions of the periphery thereof are presented to each succeeding carton to which glue is to be applied, a scraper urged into engagement with the periphery of said roller, a cam, and means operatively connected with said scraper and engaging said cam, said cam being designed so as to control said last mentioned means with the same regularity that the cartons are presented to the glue applying rollers and for the purpose of raising said scraper from its contact with said roller to thereby permit a predetermined amount of glue to pass beneath said scraper.

8. A device as claimed in claim 7 in which said scraper may be quickly adjusted for wear either of said scraper or of said roller and without affecting the operative connections with said cam.

9. In a glue applying apparatus, the combination with a rotatable roller, a scraper adapted to engage the periphery of said roller, means for

supplying the periphery of said roller with glue before it reaches said scraper, and means for raising the scraper during the rotation of said roller for a short interval of time to permit a portion of said glue to remain on the periphery of said roller, said means for raising said scraper being operable at different times during successive rotations of said roller.

10. A device as claimed in claim 9 in which the means for raising the said scraper is operable each time the roller rotates more than one complete revolution.

11. In a glue applying apparatus, the combination with a glue applying roller, a trough for supplying glue to said roller, a scraper for normally engaging said roller to scrape the glue from the periphery thereof, a cam, means controlled by said cam for raising said scraper, a gear rotatable with said cam, a gear rotatable with said roller and rotated by said first mentioned gear, the gear teeth on said respective gears being so arranged that the same rotate at different speeds, said means being operable to raise said scraper at the same time during the rotation of said cam on successive complete revolutions thereof.

12. A glue applying apparatus comprising a glue applying element movable from a glue receiving position to a glue applying position means adapted to normally engage said element to scrape the glue supplied thereto from the surface thereof, means for periodically raising said last mentioned means out of engagement with said element to permit a predetermined amount of glue to be carried by said element to said glue applying position, and means for positively limiting the distance to which said scraping means is raised away from the surface of said glue applying element to determine the thickness of the glue which remains on said element.

13. A device as set forth in claim 12 in which the scraping means is normally positively pressed into engagement with said element when in contact therewith.

14. In a glue applying apparatus, the combination with a roller which is rotatable to move glue from a glue supplying means to a glue applying position, a glue supplying means for supplying glue to said roller throughout the entire peripheral surface thereof, and a scraper having an operative scraping edge engaging said roller for scraping the glue therefrom before the glue reaches the glue applying position, and means for periodically raising said scraper out of contact with the peripheral surface of said roller, said last mentioned means being operable to raise said scraper periodically at different times with respect to a fixed point on the periphery of the roller, whereby each time the scraper is raised, the glue is permitted to remain on said roller at a different position peripherally thereof, whereby the entire peripheral surface of said roller is scraped free of glue at one time or another during the operation of said roller, whereby solidifying of a layer of glue on said roller is prevented.

15. In a glue applying apparatus, the combination with a glue applying roller, means for rotating said roller to bring the periphery thereof adjacent a glue applying position, means for scraping all but predetermined patches from the peripheral surface of said roller, means for periodically moving the scraping means out of contact with the peripheral surface of said roller at different times during successive rotations of the roller, whereby to permit the glue to remain on the roller at different positions peripherally thereof, and means for scraping the surfaces of said roller adjacent said patches free of glue to leave clearly defined patches of glue on said roller to be presented at the glue applying position.

MICHAEL J. MILMOE.