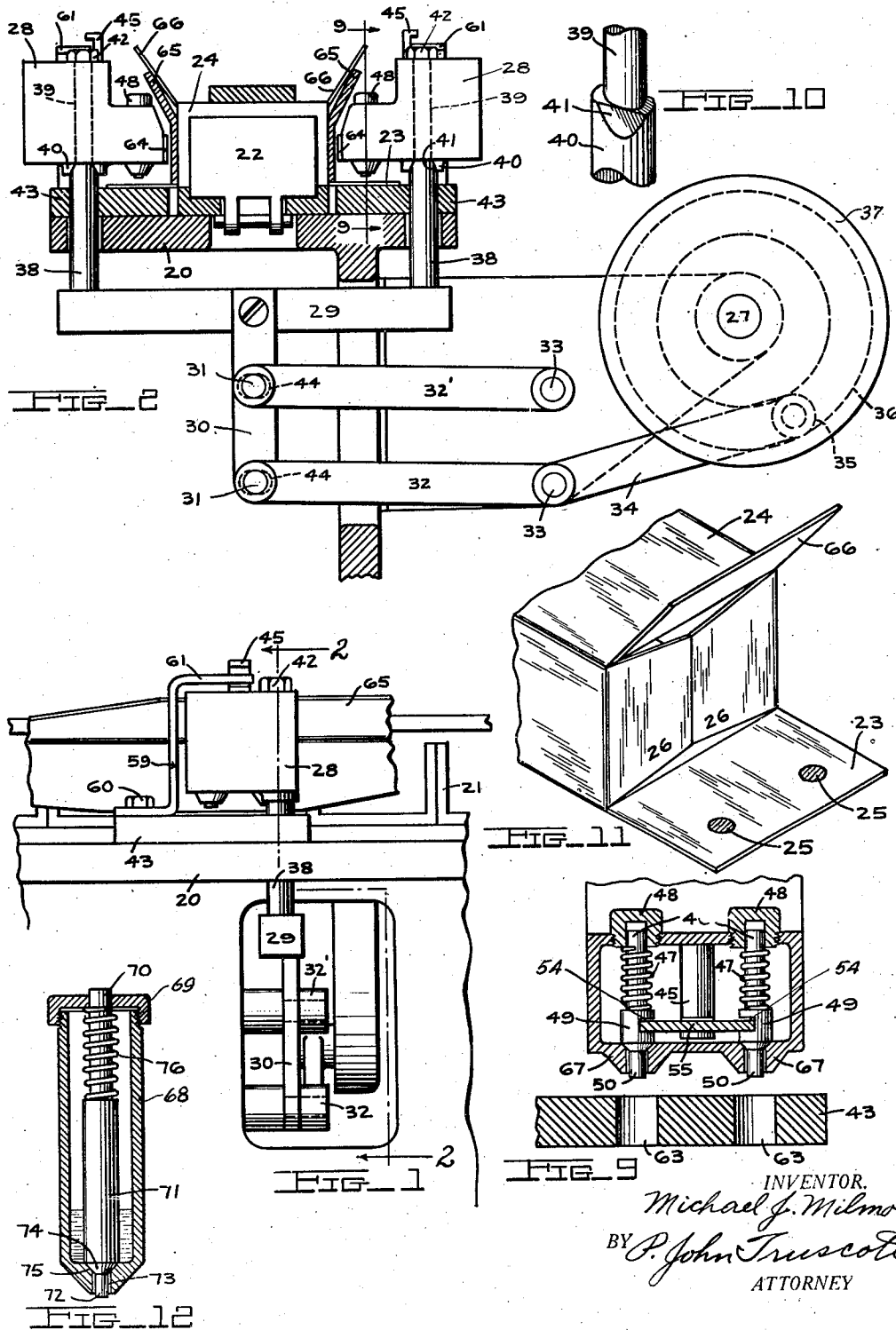


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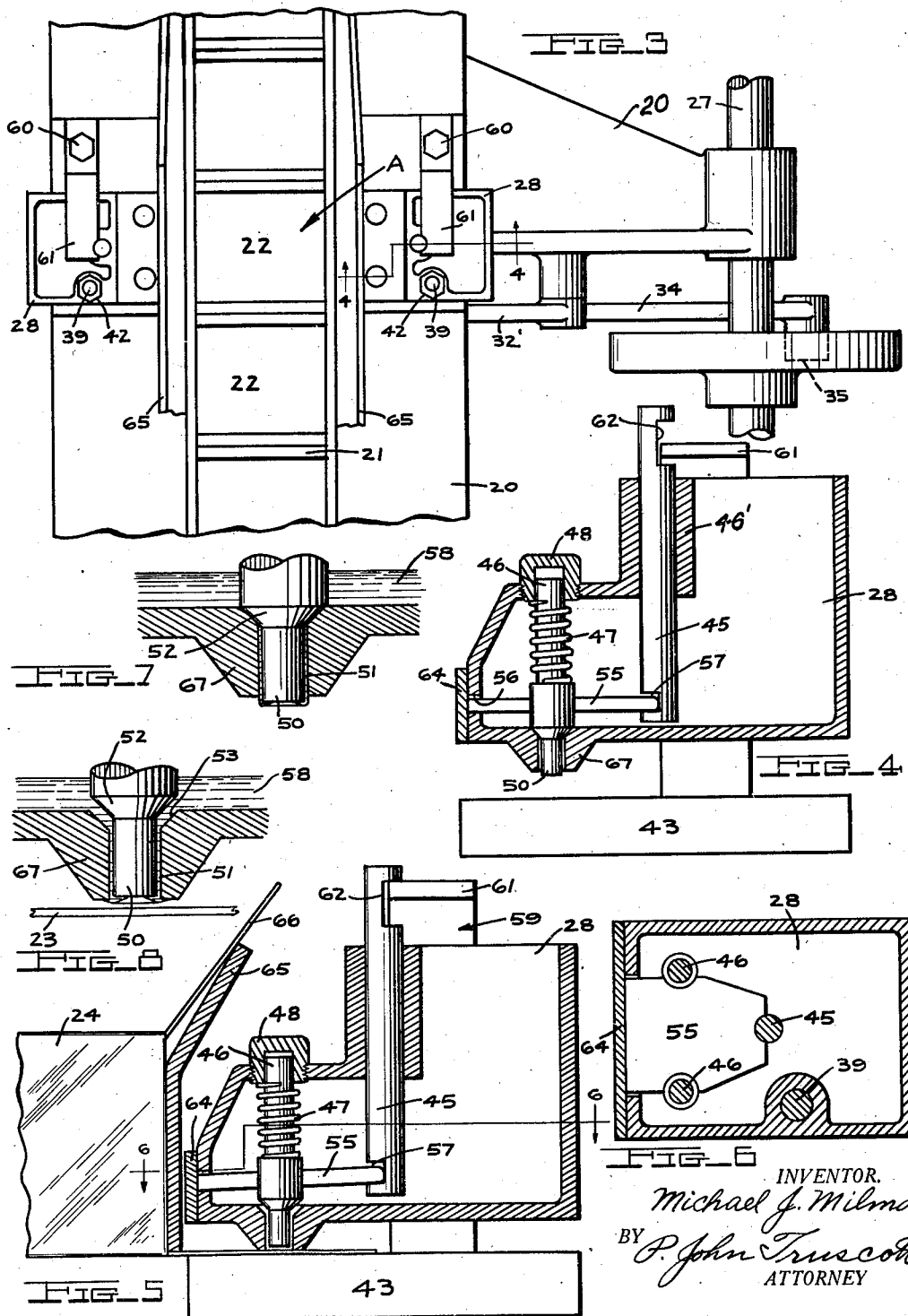
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2,081,758

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UNITED STATES PATENT OFFICE

2,081,758

GLUING MECHANISM

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Application September 4, 1934, Serial No. 742,532

17 Claims. (Cl. 91—47)

The present invention relates to gluing mechanism and one object of the present invention is to provide a simple, rugged, positive feed, glue applying mechanism which eliminates complicated driving mechanisms generally used in devices of this character and which only requires a very small amount of movement to operate properly, thus enabling the same to work efficiently even at high speeds and without throwing the glue about as in other types of such mechanisms. The positive feed also insures a proper flow of the glue as it is needed and keeps the glue passage clean.

Another object is to provide an efficient means for applying glue to the desired portions of the upper surface of a wrapper without smearing the wrapper.

Another object of this invention is to apply glue to a wrapper or the like at a plurality of spaced points, simultaneously.

Another object is to provide means for positively feeding substantially measured quantities of glue to a position where the same is to be applied to a wrapper or the like.

Another object is to keep the glue out of contact with the air as much as possible, and, as shown, the glue being supplied to the applying portion of the apparatus is not exposed to the drying influence of the air until the same reaches the said applying portion.

Another object of this invention is to utilize the means which advances and measures successive quantities of glue as at least a part of the means for applying the glue to the wrapper.

Another object is to provide a glue applying apparatus which feeds the glue through an opening below the level of the glue in the reservoir of the apparatus, the said opening or passage not being of sufficient size to permit the glue to flow by gravity therethrough, and through which the glue is positively fed to keep the passage clear and to supply a substantially measured quantity of the glue to the applying portion of the apparatus.

More specifically the invention contemplates the provision of a mechanically operated plunger for forcing glue from a reservoir through a restricted passage which is preferably restricted by a portion of the plunger itself, thus enabling one to make an extremely small passage through which glue may be forced positively without the necessity of providing a very small passage since the latter is hard to construct. The arrangement of the plunger in the passage also permits the

passage and plunger to be cleaned readily as will be pointed out more clearly hereinafter.

A further object of this invention is to provide means for preventing accumulation of glue on the backing member which supports the wrapper in position while the glue is being applied thereto, in the event that no wrapper is supplied to said position when the gluing apparatus operates.

A still further object of this invention is to provide wrapping mechanism for cartons and the like in which the cartons are moved along a given path and glue is applied thereto at a predetermined point in that path, the glue being applied while the carton is occupying its normal unfolded position with the tab or tabs to which glue is to be applied occupying a position extended from the carton.

My invention also contemplates providing a manually operated gluing mechanism which has a positive feed and is operated preferably by contact with the article to which the glue is to be applied.

Other objects of my invention will appear hereinafter as the description of the same proceeds, the novel features, arrangements and combinations being clearly set forth in the specification and claims thereto appended.

In the drawings:

Fig. 1 is a fragmentary side elevation of an apparatus embodying my invention,

Fig. 2 is a vertical cross-section taken on the line 2—2 of Fig. 1,

Fig. 3 is a plan view of the apparatus shown in Figs. 1 and 2,

Fig. 4 is a cross-section taken substantially along the line 4—4 of Fig. 3,

Fig. 5 is a view similar to Fig. 4 with the parts in another position of adjustment,

Fig. 6 is a cross-section taken along the line 6—6 of Fig. 5,

Figs. 7 and 8 are enlarged views of portions of Figs. 4 and 5 respectively,

Fig. 9 is a cross-section taken along the line 9—9 of Fig. 2,

Fig. 10 is a perspective view of one of two similar studs supporting the glue reservoirs and associated mechanism,

Fig. 11 is a perspective view of one end of a carton to which glue has been applied, and

Fig. 12 shows a vertical cross-section through a modified form of my invention.

In Fig. 3 there is shown a partial plan view of one embodiment of my invention in which there is a frame 20 for supporting the various parts. An endless conveyor chain 21 having 55

pockets 22 therein is supported by rotatable sprockets (not shown) and driven in any suitable manner to periodically position successive or selected pockets periodically at the glue applying position at A. At this position the tabs 23 of a carton in that pocket at said position, have glue applied thereto at 25 (see Fig. 11) so that when the tabs are folded upwardly and inwardly against the tabs 26 and pressed thereagainst, the tabs 23 will adhere firmly against the tabs 26 and prevent the latter from moving inwardly into the carton. By preventing the tabs 26 from moving inwardly into the carton, these tabs help to hold the carton "squared" and this is materially assisted by securing the tabs 23 and 26 to each other. Only a small quantity of glue is applied at 25 and my invention contemplates the use of novel means whereby a substantially measured quantity of glue is applied to prevent smearing and to insure that enough and not too much glue is applied at the proper place. This means is preferably driven from the shaft 27 in timed relation to the movement of the conveyor which is also preferably driven from the shaft 27 or one geared thereto, so that when the carton to be glued is arranged at position A the glue will be applied thereto.

Two glue applying devices comprising glue reservoirs 28 of similar construction are arranged on opposite sides of the conveyor for applying glue to the tabs 23, and both operate in the same manner. Similar reference numerals have been used to designate similar parts on these devices throughout the similar views and a description of one will suffice for both.

The glue reservoirs 28 are both carried on a common carrier platform 29 having a downward extension 30 rigid therewith and pivotally connected at points 31 to the free ends of the two parallel links 32 and 32' which in turn are pivoted at 33 to the frame 20. The link 32 has an extension 34 carrying a roller 35 operating in a cam groove 36 of the cam 37 secured to the shaft 27. The cam groove is such as to move the carrier 29 downward when the carton to be glued is in position to receive the glue and to move the carrier upward when the carton is moved to the next position.

At opposite ends of the carrier 29 are vertical studs 38 shaped as indicated in Fig. 10 and extending upward through suitable bores in the glue reservoirs 28. Beveled faces 40 on the studs 38 co-operate with similar faces on the opposed lugs 39 to prevent turning of the glue reservoirs 28 on the studs, the nuts 42 threaded on the upper ends of the studs being tightened down to hold the reservoirs firmly on the studs. This causes the glue reservoirs to partake of the movement of the carrier 39. The studs are guided for vertical movement in the bores in the plate 43 secured to the frame 20. Short slots 44 are provided in the ends of the links 32 and 32' to compensate for the arcuate movement of the ends of the links and prevent binding of the studs in the bores in the plate 43. Even a slight looseness in the pivotal connections at 31 will take care of the very slight arcuate movement out of a rectilinear path. The slots 44 are shown exaggerated for the purpose of illustration.

The glue reservoirs are each provided with a vertically movable pin 45 slidable in a bearing 46', and two spaced plungers 46 spring pressed downward by the springs 47 abutting against the enlarged heads 49 on the plungers 46 and the undersides of caps 48 threaded into the top of

the glue reservoir. These caps also act as guides for the upper ends of the plungers 46, the lower reduced end portions 50 of which are loosely guided in the bores 51 which are preferably only about .001 of an inch greater in diameter than the reduced end portions 50. Tapered seats 52 are also provided on the plungers and these seat against the seats 53 at the upper ends of the bores 51 for a purpose which will appear later. The bores 51 are therefore larger at their upper ends to form an enlarged chamber into which the glue gravitates when the seats 52 and 53 are separated. The springs normally hold the seats 52 and 53 in engagement with each other.

As is shown clearly in Fig. 9, each plunger 46 is provided with a notch 54, the notches on each pair of plungers facing each other and receiving the opposite edges of the plate 55 shaped substantially as indicated in Fig. 6 and forming a fulcrumed lever. One end of this plate or lever (see Figs. 4 and 5) is loosely fulcrumed within the opening 56 in the wall of the glue reservoir and the other end thereof is received within the notch 57 in the lower end of the pin 45. Therefore, when the pin 45 is moved upward relative to the glue reservoir, it lifts the end of the plate within the notch 57 and cams the plungers 46 upward against the action of the springs 47, thus separating the seats 52 and 53 and permitting the glue 58 to gravitate into the chambers at the upper ends of the bores 51. When the pin 45 moves downward relative to the glue reservoir, the glue in these chambers is forced out from between the seats 52 and 53 into the small clearance spaces or passages between the bores 51 and their respective reduced plunger portions 50, the glue already in these passages being forced out at the bottom of the reservoirs at a position to be applied to the tabs of the carton. The glue spreads over the ends of the reduced ends 50 of the plungers and the adjacent portions of the underside of the reservoir, when the plungers are retracted or moved upward relative to the glue reservoir. The ends of the plungers, while spaced ever so slightly above the underside of the reservoir, never-the-less act as a part of the means to apply the glue to the tabs.

In Fig. 5 the glue reservoir is shown in its lowest position with the glue being applied to the carton tabs 23. In this position, the plungers 46 are retracted against the actions of the springs 47, with the lower ends thereof slightly spaced from the tabs as is clearly illustrated. This clearance is exaggerated for the sake of clearness. The retraction of these plungers is accomplished in the following manner:

A stationary bracket 59 is secured to the upper surface of the plate 43 by the machine screw 60, and the upper laterally extending arm 61 thereon is arranged within the notch 62 in the pin 45. As the glue reservoir descends into the position shown in Fig. 5, the arm 61 strikes the upper end of the notch 62 and arrests the downward movement of the pin 45 and also retards the movement of the plungers, whereby the seats 52 and 53 separate and the chambers at the upper ends of the bores 51 fill with glue. Then as the glue reservoir moves upward after glue is applied to the tabs 23, the plungers are urged downward relative to the reservoir by the springs 47 to cause the seats 52 and 53 to again engage, whereby the glue between the seats is forced downward into the passages between the ends of the plungers and the bores 51, as previously explained. The glue already in these passages is

forced outward of the reservoir in position to be applied to the tabs on the next downward movement of the glue applying device.

The plate 55 after being slipped into operative position through the opening 56, is held in that position by a removable plate 64 secured in place by screws (not shown) or by any other suitable means. Note the ruggedness of this simple, yet effective, means of connecting the plate 55, pin 45 and plungers 46.

Guides 65 cam the tabs 66 upward into the position shown in Fig. 5 as the cartons advance to position A. This places the tabs 66 in positions to receive glue from another glue applying device (not shown) and when the glue has been applied to these tabs they are folded down over the outer surfaces of the tabs 23 when the latter are folded against the tabs 26.

The plate 43 acts as a backing plate for the tabs 23 when the glue is being applied thereto, and in case no carton is in a pocket arriving at the position A, the glue is not applied to the upper surface of the plate 43 for the reason that there are a pair of bores 63 therein just below and in alignment with the plungers and the ends of the bosses 67 on which there may be glue, and which are smaller at their lower ends than the bores 63, and these bosses enter but do not contact the bores. Therefore, the bores and the surface of the plate 43 remain clean and the outer surfaces of the tabs 23 are not smeared as a result. Since only an extremely small amount of glue is applied each time the glue applying mechanism moves downward, even an absence of several cartons in successive pockets in the conveyor will not cause too great a quantity of glue to accumulate on the lower ends of the plungers and the lower ends of the bosses, to enable the tabs which receive this glue to be securely held in place against the tabs 26.

In Fig. 12 I have shown a modified form of my invention adapted for manual operation. This comprises a cylindrical glue reservoir 68 having a cap 69 threaded thereon at the upper end thereof and provided with a bore to guide the upper end 70 of the plunger 71 having a lower reduced portion 72 slidably operating in the bore 73 and of a size just slightly smaller than the bore the same as in the embodiment first described. The plunger 71 also has a seat 74 co-operating with a seat 75 at the upper end of the bore 73, which seats are for the same purpose and co-operate in the same manner as do the seats 52 and 53 of the first described embodiment. A spring 76 normally holds the plunger down with the end of the plunger projecting out of the bore 73. When the operator desires to operate this device he strikes the article to which glue is to be applied, with the projecting end of the plunger 71, thus retracting the plunger and permitting glue to gravitate into the chamber at the upper end of the bore 73. On moving the device away from the article, the spring forces the plunger down and causes glue to be forced out of the chamber through the passage around the lower end of the plunger into a position on the end of the plunger, whereby, on the next application of the device to the article, glue will be applied thereto.

In the embodiment first described, it will be noted that the plungers 46 move beyond the ends of the bosses 67 and, therefore, if desired, the pin 45, plate 55 and bracket can be eliminated and the plungers 46 retracted by the contact of the same with the article itself. This is not desirable where

speed is desired as it takes longer for the glue applying device to clear the article and this would delay the movement of the conveyor in presenting the successive cartons to the position A.

Note that the glue which is being supplied to the bottoms of the plungers for application to the articles does not move a very great distance and therefore the device can be operated faster than where the glue must travel a greater distance, thus enabling the wrapping machine to be operated at a higher speed if there is no other limiting factor.

The fact that the plungers 46 and 71 are removable from their respective bores, enables one to readily clean the plungers and bores to thus maintain the desired clearance therebetween. By varying the clearance around the lower ends 50 and 52, the amount of glue supplied at each operation, may be varied. The beveled seats on the plungers and at the upper ends of the bores are not absolutely necessary as other means may be provided to force the glue through the clearance space if desired, but the form of the invention shown is preferred.

Obviously, those skilled in the art to which this invention pertains may make various changes in the arrangements and combinations of the parts shown in the embodiments of the invention illustrated, without departing from the spirit of my invention, and therefore, I do not wish to be limited except as hereinafter set forth in the appended claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, the combination with a glue reservoir having a passage through the bottom wall thereof, formed with an inner enlarged chamber, a plunger having a portion operating in said passage of a size slightly smaller than said passage to provide a clearance space about said portion of a size through which liquid glue will not gravitate but through which it may be forced and having an enlarged portion operating in said chamber for forcing glue in said chamber through said clearance space, means for resiliently and periodically urging said plunger downward, and means other than the work to which the glue is applied for positively and periodically moving said plunger upward, the enlarged portion on the plunger forcing the glue from said chamber into and through said passage, on the downward movement thereof, into glue applying position on said device.

2. In a device of the class described, the combination with a frame, a conveyor on said frame for conveying articles to be glued to a glue applying position, and a glue applying mechanism at said position comprising a glue reservoir movable to and from said articles when said articles are at said position, said reservoir having an opening through a wall thereof through which the glue may move, a plunger having a portion of slightly smaller size than said opening extending therethrough whereby to form a glue passage of small cross section and having a piston portion movable within said reservoir to force glue through said passage into glue applying position on said mechanism, and stationary means co-operating with said plunger to move said plunger relative to said reservoir as said reservoir moves toward said article, and means for moving the plunger in the opposite direction relative to said reservoir as said reservoir moves away from

said article to cause said plunger piston portion to force glue through said passage into glue applying position on said mechanism.

3. A device as set forth in claim 2 in which said last mentioned means comprises a spring.

4. A glue applying device comprising a reservoir having a passage therethrough, a movable support carrying said reservoir to and from a glue applying position, a plunger slidable in said passage, a pin slidably mounted on said reservoir, a fulcrumed lever mounted on said reservoir, said pin and plunger being pivotally connected to said lever at different distances from the fulcrum therefor, stationary means co-operating with means on said pin to arrest the advance of said pin with said reservoir as the latter moves toward glue applying position, to thereby retard the motion of said plunger whereby said plunger moves at a rate less than said reservoir and slides inwardly in said passage, and means for moving the plunger in the opposite direction as the reservoir makes its return movement to force glue from said reservoir into and through said passage, into glue applying position.

5. A device as set forth in claim 4 in which said fulcrumed lever comprises a plate, one end of which rests against an abutment on said reservoir with portions thereof at distances from said end resting freely within recesses in said plunger and pin, the pin being farther from the said end than said plunger.

6. In a device of the class described, the combination with a glue reservoir having a passage through a wall thereof below the level of the glue therein, a plunger reciprocating in said passage having means for forcing glue into and through said passage, as the plunger moves in one direction through said passage, a pin slidably mounted on said reservoir for movement substantially parallel with that of said plunger, a lever having one end thereof resting against an abutment on said reservoir and pivotally connected to said plunger and to said pin at different distances from said end, and means for actuating said pin to move said plunger.

7. A device as set forth in claim 6 in which an additional plunger is used and in which the reservoir has another passage parallel to the first passage in which said additional plunger operates to force glue through said last mentioned passage, and in which each plunger has a notch to receive the edge of said lever, the plungers being located on opposite sides of said lever and being located at substantially the same distance from said end, with the notches of said plungers opposed to each other, the plungers preventing sidewise movement of said lever, and in which said pin has a notch receiving the opposite end of said lever, the pin preventing endwise movement of said lever in one direction, and in which the lever is prevented from endwise movement in the opposite direction by a removable member which, when removed from operative position, enables one to slide the lever from the notches in said plungers and pin.

8. In a glue applying mechanism, the combination with a glue reservoir having a passage through the wall thereof at a point below the level of the glue therein, a plunger having a portion axially reciprocable in said passage and of a size sufficient to prevent gravitational flow of liquid glue between it and the walls of said passage, means for maintaining said portion in said passage, means for moving said reservoir to-

ward glue applying position, and means on the plunger operable as said reservoir moves away from said position for positively forcing glue into and through said passage to the glue applicator.

9. In a device of the class described, the combination with a frame, a conveyor on said frame for conveying articles to be glued to a glue applying position, and a glue applying mechanism at said position comprising a glue reservoir movable to and from said articles when said articles are at said position, said reservoir having a passage through a wall thereof through which the glue may move, a plunger movable with respect to said reservoir and also normally movable bodily therewith having a portion of slightly smaller size than said passage arranged therein and a piston portion operable to force glue through said passage into glue applying position on said mechanism, and stationary means arranged in a position to engage means on said plunger as it moves with said reservoir to move said plunger relative to said reservoir as said reservoir moves toward said article, and means for moving the plunger in the opposite direction relative to said reservoir as said reservoir moves away from said article to cause said plunger piston portion to force glue through said passage into glue applying position on said mechanism.

10. A device as set forth in claim 4 in which said fulcrumed lever comprises a plate, one end of which rests against an abutment on said reservoir with portions thereof at distances from said end resting freely within recesses in said plunger and pin, the pin being farther from the said fulcrum than said plunger.

11. In a device of the class described, the combination with a glue reservoir having a passage through a wall thereof below the level of the glue therein, a plunger reciprocating in said passage having means for forcing glue into and through said passage, as the plunger moves in one direction through said passage, a pin slidably mounted on said reservoir for movement substantially parallel with that of said plunger, a lever having one end thereof resting against an abutment on said reservoir and pivotally connected to said plunger and to said pin at different distances from said fulcrum, and means for actuating said pin to move said plunger.

12. In a device of the class described, the combination with a glue reservoir movable bodily to and from the work to which glue is to be applied, an opening in a wall of said reservoir on the side thereof presented to said work, a plunger movable within said opening having a relatively small clearance between it and the walls of said opening, the end of the plunger which faces said work being provided with a substantially flat face, means for moving said reservoir to and from a position in contact with said work when the latter is at a glue applying position and having a seat surrounding said opening for contacting said work when said reservoir is in said last mentioned position, a piston portion on said plunger within the reservoir, means for actuating said plunger as said reservoir moves away from said position to cause said piston portion to force glue through the opening, and means for retracting the end of the plunger which faces the work entirely within said opening when said reservoir is in said position.

13. In a device of the class described, the combination with a glue reservoir movable bodily to and from the work to which glue is to be applied, an opening in a wall of said reservoir on the side

thereof presented to said work, a plunger movable within said opening having a relatively small clearance between it and the walls of said opening, the end of the plunger which faces said work being provided with a substantially flat face, means for moving said reservoir to and from a position in contact with said work when the latter is at a glue applying position, and having a seat surrounding said opening for contacting said work when said reservoir is in said last-mentioned position, a piston portion on said plunger within the reservoir, means for actuating said plunger as said reservoir moves away from said position to cause said piston portion to force glue through the opening, and means other than the work to which the glue is to be applied for retracting the end of the plunger which faces the work entirely within said opening when said reservoir is in said position.

14. In an adhesive applying device, a reservoir for adhesive, an opening leading from the reservoir to an adhesive applying position, a plunger arranged within said opening, said plunger being slightly smaller than the opening, means for reciprocating the plunger axially within the opening while maintaining it therein whereby to produce a passageway of very small cross section through which the adhesive normally will not flow, said plunger having an enlarged piston portion arranged within the reservoir adjacent the reservoir end of said passageway and operable upon reciprocation of the plunger to force adhesive through said passageway under pressure.

15. In an adhesive applying device, a reservoir for adhesive, an opening leading from the reservoir to an adhesive applying position, a plunger arranged within said opening, said plunger being slightly smaller than the opening, means for reciprocating the plunger axially within the opening while maintaining it therein whereby to produce a passageway of very small cross

section through which adhesive normally will not flow, an enlarged piston portion on the plunger within the reservoir adjacent the reservoir end of said passageway, a conical seat on said piston portion, and a cooperating conical seat on the reservoir, said seats being operable upon reciprocation of the plunger to force adhesive through said passageway under pressure.

16. In an adhesive applying device, an adhesive reservoir having an inner chamber and an outer bore communicating therewith, a plunger slidable in said bore and chamber having a portion with but a clearance of not substantially over one one-thousandths of an inch between it and the wall of said bore whereby to form a capillary adhesive passage, said plunger having a piston portion operating within said chamber for forcing adhesive therein into and through said passage.

17. An adhesive applying device comprising an adhesive reservoir having a passage through a wall thereof, said passage having a tapered seat at the inner end thereof arranged at an angle of at least forty-five degrees with respect to the axis of said passage, and a plunger operating in said passage having a seat thereon shaped to conform to said first mentioned seat and adapted to cooperate therewith when the plunger is moved outwardly of said passage, and means for moving said plunger to engage said seats to force adhesive between the respective seats into and through said passage, said plunger having a portion operating in said passage of a size slightly smaller in cross section than said passage whereby to form an adhesive passageway of very small cross section through which adhesive will not gravitate when said seats are out of engagement with each other but through which adhesive may be forced by the engagement of said seats.

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