

(No Model.)

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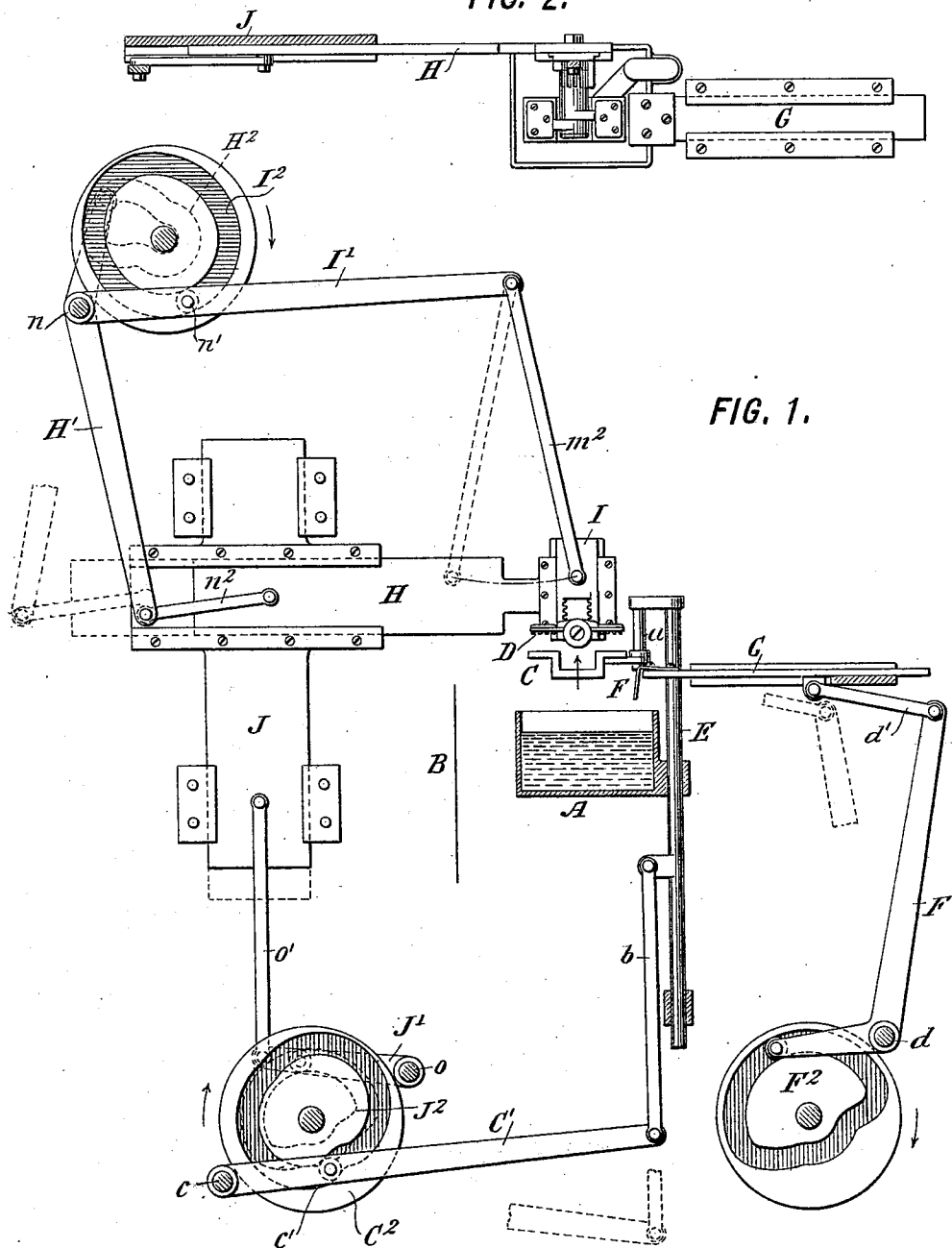
H. E. SMYSER.

MECHANISM FOR APPLYING ADHESIVES TO PAPER.

No. 561,141.

Patented June 2, 1896.

FIG. 2.



WITNESSES:

C. E. Ashley
Fred White

INVENTOR:

Henry E. Smyser,
By his Attorneys,
Arthur C. Fraser & Co.,

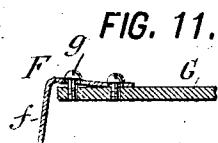
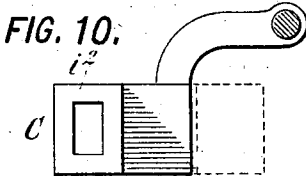
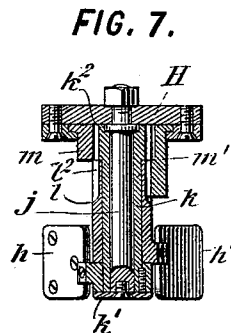
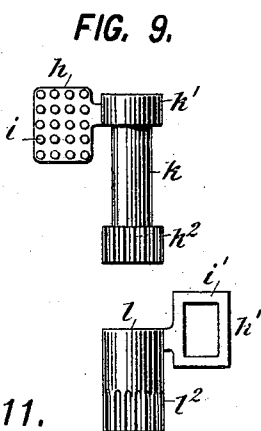
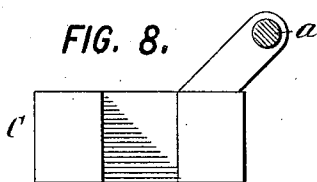
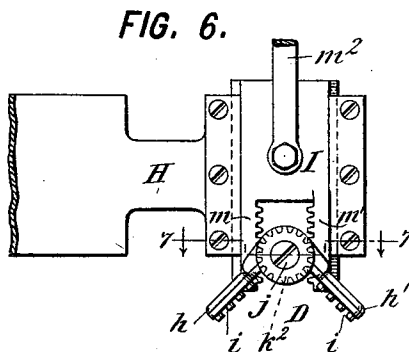
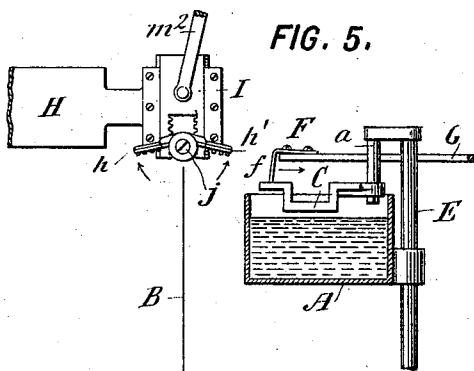
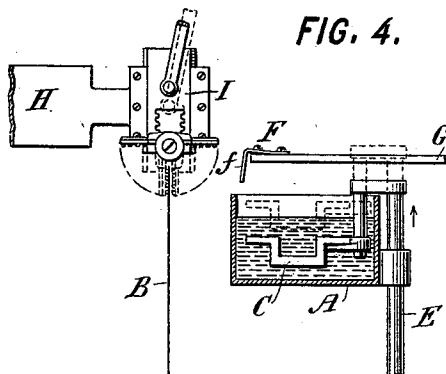
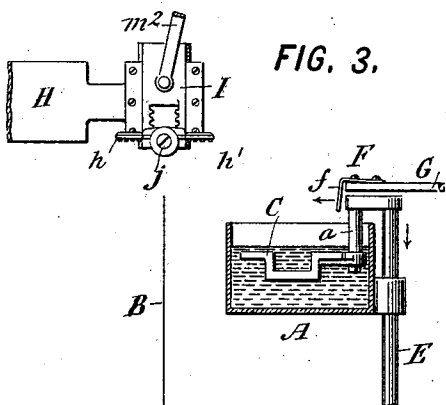
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3 Sheets—Sheet 2.

H. E. SMYSER.
MECHANISM FOR APPLYING ADHESIVES TO PAPER.

No. 561,141.

Patented June 2, 1896.



WITNESSES:
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(No Model.)

3 Sheets—Sheet 3.

H. E. SMYSER.

MECHANISM FOR APPLYING ADHESIVES TO PAPER.

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FIG. 13.

FIG. 12.

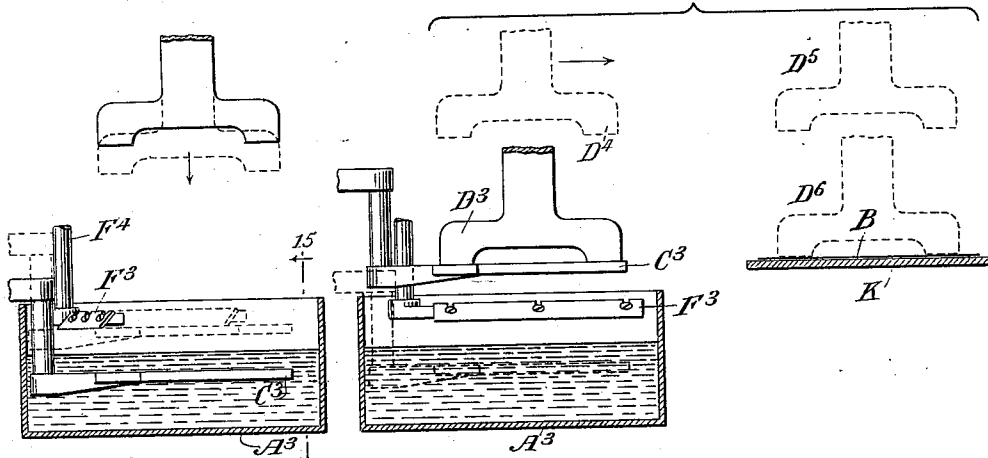
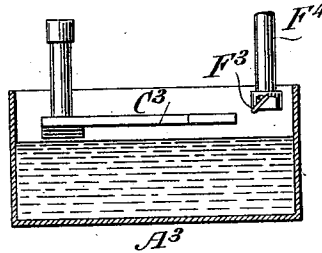
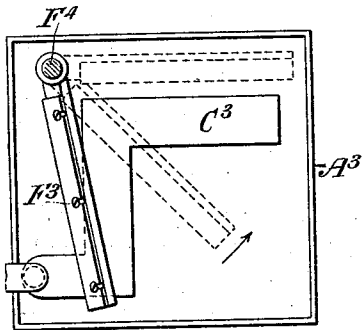


FIG. 14.

FIG. 15.



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UNITED STATES PATENT OFFICE.

HENRY E. SMYSER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
ARBUCKLE BROTHERS, OF NEW YORK, N. Y.

MECHANISM FOR APPLYING ADHESIVES TO PAPER.

SPECIFICATION forming part of Letters Patent No. 561,141, dated June 2, 1896.

Application filed November 16, 1894. Renewed September 25, 1895. Serial No. 563,664. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. SMYSER, a citizen of the United States, residing in Philadelphia, (Germantown,) in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Mechanism for Applying Adhesives to Paper, &c., of which the following is a specification.

10 This invention relates to what may be called "pasting" or "gluing" mechanism for applying paste, glue, or other adhesive substance to paper, cardboard, wood, cloth, or other suitable or analogous substance. Although applicable to a great variety of machines where-
15 ever it is required to apply glue, paste, or other cementitious substance to sheets, plates, or boards, the improved mechanism provided by my invention is especially designed and adapted for use in machines for making paper
20 boxes, bags, envelopes, or the like. My improved mechanism has been found especially advantageous for the application of glue, for which use it successfully overcomes the difficulties heretofore inherent in the use of glue,
25 and especially those due to its disposition to form threads or filaments and to dry prematurely and choke the mechanism.

According to my invention a mass of the
30 paste, glue, or other adhesive substance is kept in a suitable open-topped vessel, being heated, if necessary, to retain it in suitable condition for working. A plate or plunger moves down into the mass of glue, &c., so as
35 to be submerged therein, and then rises above the same and pauses while the surplus glue is removed by means of a scraper which rubs over the surface of the plunger and leaves only a suitably thin film adhering thereto.
40 By a further movement a dabber is brought into contact with the surface of the plunger, so that it takes from this surface a portion of the glue, after which by a further movement the dabber is brought into contact with the
45 sheet, plate, or other article to which the glue, &c., is to be applied and presses the glue against the surface thereof, so as to leave a suitable film adhering thereto, whereupon the dabber is separated from this surface. The

plunger meanwhile redescends into the mass 50 of glue and the operation is repeated.

I will now proceed to describe my invention with respect to two different embodiments thereof illustrated in the accompanying drawings, wherein—

55 Figures 1 to 11, inclusive, illustrate the first construction or embodiment of my invention; and Figs. 12 to 15, inclusive, illustrate a second embodiment thereof. Fig. 1 is an elevation, partly in section, affording a general
60 view of the entire mechanism. Fig. 2 is a plan thereof, partly in horizontal section. Figs. 3, 4, and 5 are fragmentary sectional elevations showing the operative parts in different successive positions. Fig. 6 is a fragmentary elevation, on a larger scale, showing the dabbers
65 and part of their operative mechanism. Fig. 7 is a horizontal transverse section on the line 7 7 in Fig. 6. Fig. 8 is a plan of the plunger. Fig. 9 is a plan of the two dabbers and their
70 rotative shafts and pinions disconnected. Fig. 10 is a plan of a modified construction of plunger. Fig. 11 is a vertical transverse section, on a larger scale than Fig. 1, showing the scraper. Of the views showing the second
75 construction, Fig. 12 is a sectional elevation showing the mechanism in full lines in one position and in dotted lines in other successive positions. Fig. 13 is a similar view showing still other positions of the mechanism. Fig. 14 is a plan of Fig. 13. Fig. 15 is
80 a vertical section on the line 15 15 in Fig. 13.

I will first describe the construction shown in Figs. 1 to 11, which embodies all features
85 of my invention.

Let A designate the tank or vessel containing the adhesive material, which for the purposes of this description I will assume to be glue.

Let B designate the sheet of paper, card-
90 board, muslin, pasteboard, or other material, which for the purposes of this description I will assume to be paper, to which the glue is to be applied, which sheet is mounted or sustained in position by any suitable means,
95 which, as such means are well understood in the art, I have not deemed it necessary to show.

Let C designate the plunger, consisting in this construction of a plate arranged horizontally and moving in a vertical direction, so as to be plunged down into the glue and raised above it.

Let D designate what I call the "dabber," by which the glue is taken from the plunger and applied to the sheet of paper.

In the construction shown the glue-vessel A is stationary and the plunger C moves vertically, descending into the mass of glue and rising above it at suitable intervals. To impart the necessary movements, the plunger is connected by a post *a* to a vertical slide E, shown as a sliding bar, which slide is connected by a link *b* with a lever C', which is fulcrumed at *c* and driven by a cam C². On the lever is pivoted an antifriction-roller *c'*, which travels in a cam-groove in the face of the cam by which the desired movements are imparted to the lever. Starting with the position where the plunger is immersed in the glue, as shown in Fig. 4, the plunger-slide first rises sufficiently to bring the plunger out of the glue to the position shown in Fig. 5, where it pauses to permit the excess of glue to drain off from the plunger and fall back into the vessel. While in this position a scraper or wiper F moves across the upper face of the plunger in order to remove any excess of glue from its surface. This scraper F is constructed with a blade *f*, attached to a horizontally-moving slide G, and with an adjusting screw or screws *g*, (see Fig. 11,) by means of which the scraping edge of the blade may be raised or lowered in order to adjust the thickness of the film of glue that shall remain on the plunger after the scraping operation. While the plunger dwells in this position the scraper is moved horizontally over it in the manner indicated in Fig. 5. When the scraper is moved past it to the position shown in Fig. 1, the plunger again rises, as shown in Fig. 1, and continues moving until it comes in contact with the dabber D, which stands above it, so that by this contact it applies a film of glue to the under surface of the dabber. The plunger then descends with a continuous movement until it is again submerged in the bath of glue. The scraper F is operated from a cam F² through the medium of a lever F', pivoted at *d* and connected to the slide G by a link *d'*. The dabber D is in this embodiment of my invention of somewhat peculiar construction, and has several movements. The dabber consists of two wings or leaves pivotally connected so as to either turn out flat, as shown in Fig. 1, or swing in against each other in order to embrace the sheet of paper between them, as shown in dotted lines in Fig. 4. They are shown in an intermediate position in Fig. 6. The movements of the dabber-wings are as follows: Starting from the fully-open position shown in Fig. 1, where they receive glue from the plunger, they first move bodily to the left to the position shown in Fig. 3. They then

move downward to the position shown in dotted lines in Fig. 4, where they stand close above the upper edge of the sheet of paper. The two wings then swing inward around their common pivotal axis until they embrace the upper edge or portion of the sheet of paper between them and apply the glue thereto. They then unfold or swing open and then rise bodily and then move bodily to the right, stopping again in the position for receiving glue.

The detail construction of the dabber thus described is as follows: The two wings *h* *h'* consist of flat plates having projections *i* wherever it is desired to apply the glue. Both wings are pivoted to turn around the same axial stud *j*, which is fixed to and projects from the outer end portion of a horizontally-moving slide H. The wing *h* has a hub *k'*, which is keyed upon a sleeve or tubular shaft *k*, which turns freely on the stud *j*, and on the inner end of which is formed a pinion *k*². The other wing *h'* is mounted directly on a sleeve *l*, which turns freely around the sleeve *k*, and on the end of which is formed a pinion *l*². The wings are caused to turn out and in by a pair of racks *m* and *m'* engaging the respective pinions *k*² and *l*², these racks being fixed to a vertically-moving slide I, guided in slideways formed on the slide H. The movements of this slide are imparted by a cam I², acting through a lever I' and link *m*². The lever I' is pivoted at *n*, and has an antifriction-roller *n'* engaged by the cam-groove in said cam.

The horizontally-moving slide II is for the purpose of moving the dabber from the glue-receiving position to the position over the paper. This slide is moved from a cam II², arranged behind the cam I², its cam-groove being shown in dotted lines in Fig. 1. This cam-groove engages a roller on the end of a lever II', pivoted at *n*, the other arm of which is connected by a link *n*² to the slide II.

The vertical bodily movements of the dabber over the paper are imparted by means of a vertically-moving slide J, having slideways carrying the slide II. The slide J derives motion from a cam J², arranged behind the cam C², its cam-groove being shown in dotted lines in Fig. 1, and engaging a roller on a lever J', pivoted at *o*, and its end connected by a link *o'* to the slide J.

The several cams II², I², C², J², and F² are all revolved synchronously in the direction indicated by the arrows, being driven through any suitable driving mechanism.

The operation of these several parts together is as follows: I will commence with the position shown in Fig. 1, where the plunger C is ascending to carry the glue to the dabber and all the other parts are stationary. When the plunger reaches the dabber, it stops, and after a slight dwell commences to descend. The dabber then, by a movement of the slide H, moves to the left from the position shown in Fig. 1 to that shown in Fig.

3. During this movement the plunger C has descended into the glue vessel, as shown. The slide J then descends, carrying the dabber down to the position shown in full lines in Fig. 4, and during this movement the plunger C continues to move down in the bath of glue and the scraper F advances over the plunger to the position shown in Fig. 4. Next the slide I is caused to descend, so that through the action of the racks which it carries upon the pinions of the dabber-wings these wings are caused to swing inward to the position shown in dotted lines in Fig. 4, so that they embrace the paper on opposite sides and press it between them, so as to apply the glue to the paper on both sides thereof. After a brief dwell in contact with the paper the wings open out again, being shown in Fig. 5 in the act of so doing. Meanwhile the plunger C has ascended to the position shown in Fig. 5, where it stops. The scraper F then moves back, its edge moving across the top of the plunger to scrape off the excess of glue. The dabber-wings when fully open are then raised by the return movement of the slide J, and the slide H then moves to restore the dabber to its first position over the plunger C. This plunger, as soon as the scraper F has passed across it, has meanwhile started to reascend and again meets the dabber, and applies glue to it shortly after the latter has come to rest. The same cycle of operations is then repeated.

When working with glue, it is usually preferable to apply the glue in small dots, for which purpose I prefer to provide the wings of the dabber D with small isolated projections *i*, as shown in Figs. 6 and 9. The shape of the wings of the dabber will of course depend upon the shape of the space to which it is desired to apply glue on the paper. If glue is to be applied to only one side of the paper, only one wing of the dabber must receive glue from the plunger, to accomplish which result that portion of the plunger which otherwise would come in contact with the other wing must be cut away. This is indicated in Fig. 10, where the portion indicated in dotted lines is entirely removed, so that it cannot carry any glue to the wing *h'*. In this case this wing serves solely as a presser or platen for holding the paper, while the wing *h* presses against it to apply glue to its other side. In some cases it is desirable to apply only a narrow band of glue, in which case the wing which applies the glue will have its projecting surface *i*, formed in a narrow band, as shown at *i'* in Fig. 9, and in such case the plunger may correspondingly be cut away, so as to leave only that portion shown at *i''* in Fig. 10. The mechanism thus far described has been especially designed and adapted for applying glue to close the open mouth of a paper bag already filled with a quantity of some comminuted substance in an automatic packaging-machine of my invention, this machine being of the character set forth in my Patent No.

449,275, dated March 31, 1891, and subsequent patents. The precise application of my present invention, in connection with the other mechanism of such machine, will be set forth in another application for patent for automatic packaging-machines now in course of preparation. My present invention, however, is not confined in its application to the combination of mechanism hereinbefore described, but may be greatly varied by its application in connection with various other mechanisms.

Figs. 12 to 15 show a construction which is especially adapted for the application of paste. In these figures the paste vessel is lettered A³, the plunger is lettered C³, and the dabber is lettered D³. The scraper is lettered F³. All the operative parts are shown in Fig. 12; but I have not deemed it necessary to show the cams and mechanical connections for imparting motion to them, as these will not differ, essentially, from those specifically shown in Fig. 1, it being within the province of any mechanic to design suitable mountings for the slides and a suitable arrangement for the cam levers and links, and to plot or develop the proper shape for the cam-grooves. The plunger C³ moves vertically, as before, having precisely the movements already described, except that it does not rise so high. It is shown immersed in the paste in full lines in Fig. 13, and in dotted lines it is shown as having risen just above the mass of paste, though still within the vessel A³, in which position it dwells while the scraper F³ slides over it to remove the excess of paste. The scraper in this construction is mounted on a radial arm projecting from an oscillating shaft F⁴, its movement being otherwise the same as before described. After the scraper has passed out of the way the plunger C³ rises to the position shown in full lines in Fig. 12, where it dwells while the dabber D³ descends upon it and picks up the paste from its surface. The dabber then rises to the position shown in dotted lines in Fig. 12 at D⁴, then moves or swings over to the position shown at D⁵, and then descends to the position shown at D⁶, where it comes upon the paper B lying on a table K, so that it applies the paste to the paper, after which it rises to the position D⁵, moves again to D⁴, and descends again into contact with the plunger, which meanwhile has redescended into the paste to receive a fresh coating.

The apparatus may be otherwise modified without departing from what is essential to my invention, as hereinafter defined in the claims. It is within my invention to apply the glue from the plunger to the dabber by the moving of the plunger against the dabber while the latter is stationary, an example of which is shown in Figs. 1 to 11, or, on the contrary, by moving the dabber down into contact with the plunger while the latter is at rest, an example of which is shown in Figs. 12 to 15. Instead of moving the dabber to carry the glue or other substance to the pa-

per the paper may be moved against the dabber the latter remaining stationary during this movement of the paper. In fact, it is not essential to my invention that the dabber should move at all, as a wholly stationary dabber might be employed, the plunger moving far enough to apply the adhesive to it, and the paper being then moved against it. Other purely mechanical or structural modifications may be resorted to by the mechanic or designer in adapting my invention for different uses or applications.

My invention introduces important practical advantages in the working both of glue and paste, as well as other cementitious substances. The movement of the plunger into the mass of glue or paste at every stroke prevents any of the adhesive material from drying upon its surface. The removal of the excess of adhesive material from the plunger by scraping the excess from its surface avoids the applying of an excessive quantity of adhesive to the paper and the squeezing of any excess beyond the proper surface of the dabber, which would gradually enlarge the active surface thereof, and also in the case of glue tends to avoid the drawing of the glue into threads upon the separation of the respective surfaces. The formation of these threads or filaments of partly-dried glue, which often form in great numbers and which almost instantly dry and harden in the air as they are drawn out, has proven a source of great difficulty in machines where it has been attempted to apply glue in small quantities to paper or the like. The dabber by having its surfaces restricted to the exact area upon which the glue is desired to be applied to the paper, and having this surface alone come in contact with the glue-coated surface of the plunger, is continually remoistened from the plunger and moves therefrom to the paper so quickly that the glue cannot dry before being applied to the paper.

In practical operation my improved mechanism has proved itself to successfully overcome all difficulty from the drawing of the glue into threads or filaments, or from the caking, choking, or obstructing of any of the parts by dried glue. When the machine is stopped at night, the plunger is lowered into the glue vessel, and the latter is covered over to prevent evaporation, the gluing-surfaces of the dabber being wiped clean. By this means the entire quantity of glue is preserved in good condition for commencing work when the machine is again started, and without waste or loss.

I claim as my invention the following-defined novel features, substantially as hereinbefore specified, namely:

1. The combination of a vessel containing adhesive material, a plunger movable down beneath the surface of the adhesive, and up above its surface, a dabber receiving adhesive from the plunger and transferring it to the sheet to be gummed, mechanism for mov-

ing the plunger adapted to cause it to dwell in its upstroke after emerging from the adhesive bath, and a scraper movable across the surface of the plunger during its dwell to remove from it the excess of adhesive material.

2. The combination of a vessel containing adhesive material, a plunger movable down beneath the surface of the adhesive and up above its surface, a dabber receiving adhesive from the plunger in its latter position, and adapted to apply it to the sheet to be gummed, said dabber constructed with folding wings, and a mechanism for swinging the wings of the dabber from their open position for receiving adhesive, to a closed position for pressing it into contact with the sheet.

3. The combination of a vessel containing adhesive material, a plunger movable down beneath the surface of the adhesive, and up above its surface, and a dabber receiving adhesive from the plunger in its latter position and adapted to apply it to the sheet to be gummed, said dabber constructed with folding wings and movable laterally, and mechanisms for swinging the wings of the dabber and for moving it bodily in lateral direction.

4. The combination of a vessel containing adhesive material, a dabber constructed with folding wings, means for applying adhesive to said dabber while its wings are open, and mechanism for swinging the wings of the dabber to close them upon the sheet to which the adhesive is to be applied.

5. The combination of a vessel containing adhesive material, a dabber constructed with folding wings, means for applying adhesive to one of the wings only of said dabber, and mechanism for swinging the wings of the dabber from their open position for receiving adhesive to close them upon the sheet to be gummed, whereby adhesive is applied by one wing to one side of the sheet, while the other wing serves to press the sheet against the coated wing.

6. The combination of a vessel containing adhesive material, a plunger movable down beneath the surface of the adhesive, and up above its surface, a dabber receiving adhesive from the plunger and adapted to apply it to the sheet to be gummed, a laterally-moving slide carrying said dabber, and said dabber constructed with folding wings and a mechanism for swinging said wings toward or from each other.

7. The combination of a vessel A, a vertically-movable plunger C, a dabber D, a horizontally-movable slide II carrying it, a vertically-movable slide J carrying the slide II, and a driving mechanism for reciprocally moving the respective parts, whereby to convey adhesive material by the plunger to the dabber and thence transfer it by movements of the slides carrying the dabber to the paper.

8. In a mechanism for applying adhesive, a dabber D for receiving the adhesive material and transferring it to the sheet to be gummed, constructed with two folding wings *h h'* each

mounted to turn on a pivotal axis, a cam for opening and closing said wings, and intervening connections for communicating motion from said cam to said wings.

5 9. In a mechanism for applying adhesive, a dabber D for receiving the adhesive material and transferring it to the sheet to be gummed, constructed with two folding wings *h h'* each
10 mounted to turn on a pivotal axis, and provided with pinions, and means for swinging said wings toward and from each other consisting of a slide, two opposite racks carried by said slide and engaging the respective pinions, and mechanism for moving said slide.

15 10. In a mechanism for applying adhesive, a dabber D for receiving the adhesive material and transferring it to the sheet to be gummed,

constructed with two folding wings *h h* mounted to turn both on the same axis, an axial stud *j*, the tubular sleeve *k* turning on
20 said stud and carrying one of said wings, the tubular sleeve *l* turning on said sleeve and carrying the other wing, pinions on said sleeves respectively, racks engaging the respective pinions on opposite sides, a slide carrying the racks, and a driving mechanism for
25 moving the slide.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY E. SMYSER.

Witnesses:

JAMES J. FROST,
ARTHUR C. FRASER.