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MACHINE FOR APPLYING SPOTS OF GLUE TO SHEETS OF PAPER

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2 Sheets-Sheet 1

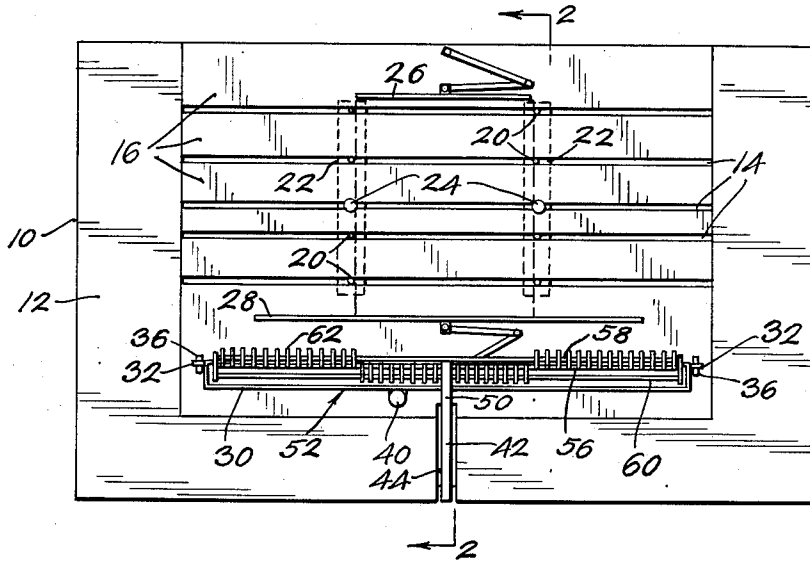


Fig. 1.

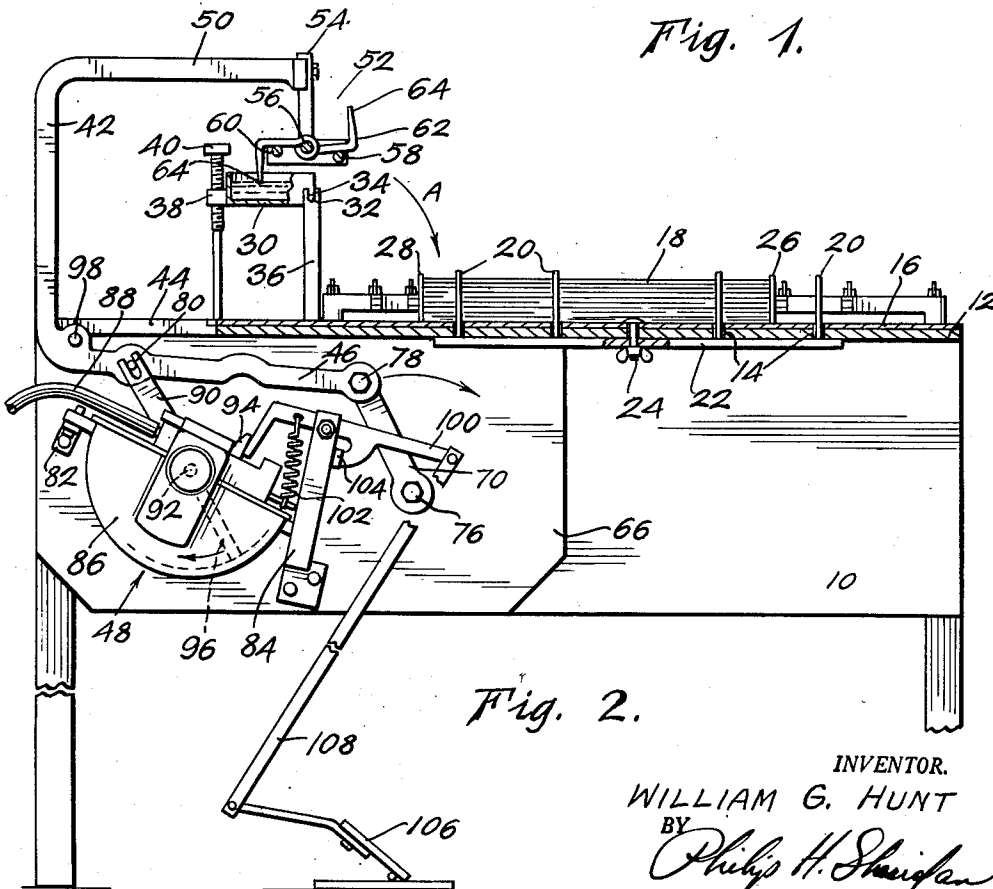


Fig. 2.

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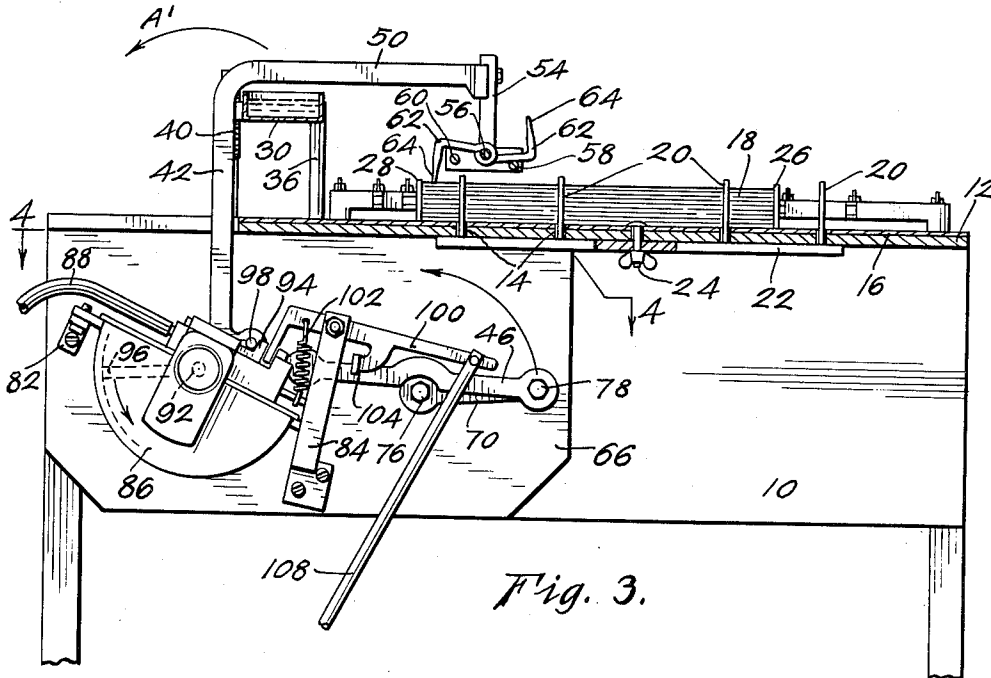
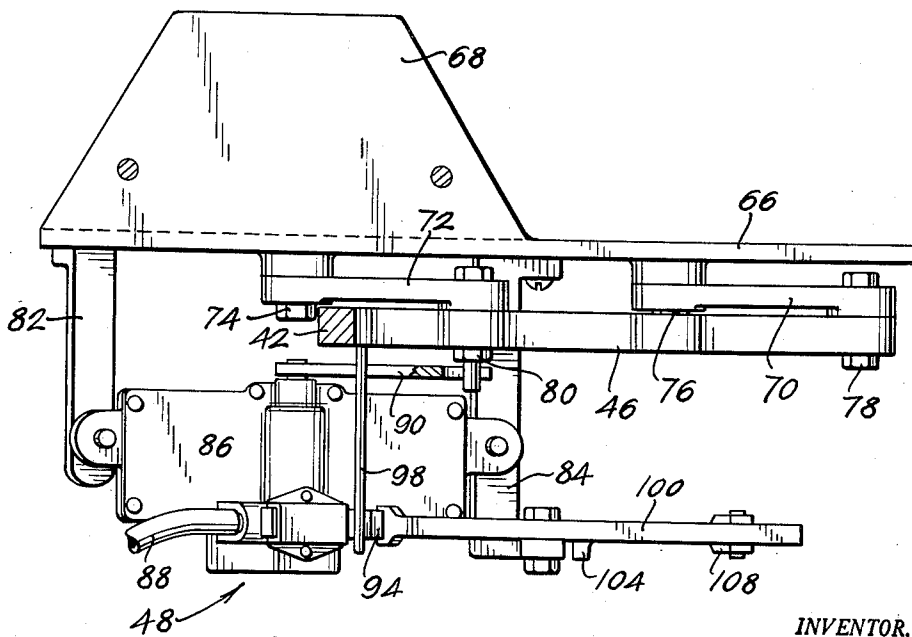
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MACHINE FOR APPLYING SPOTS OF GLUE TO SHEETS OF PAPER

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2 Sheets-Sheet 2



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1

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MACHINE FOR APPLYING SPOTS OF GLUE TO SHEETS OF PAPER

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7 Claims. (Cl. 118—211)

This invention relates to printers' machines and more particularly to gluing machines for use in applying glue to sheets of paper that are assembled to form multi-leaf forms.

The assemblage of a plurality of printed sheets and carbon paper into what is commonly known as a "collated form" has heretofore required the use of a very complicated and expensive machine which is well beyond the financial reach of the average printing establishment or business office. Hence, a relatively few large printing businesses are the only ones that are equipped with facilities for the economical production of collated forms.

It is the principal object of this invention to provide an improved machine for forming multi-leaf forms.

It is another object of the present invention to provide a much simplified and inexpensive gluing machine which is to be used in the production of collated forms for applying the glue to the individual sheets.

Another object of the invention is the provision of a gluing machine provided with novel means for controlling the amount of glue transferred to the sheets.

A further object of the invention is the provision of a gluing machine of the type described incorporating a simplified and improved actuating means driven by a conventional vacuum motor of the type used to drive automobile windshield wipers.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawing which follows, and in which:

Figure 1 is a top plan view of the entire machine;

Figure 2 is a section taken along line 2—2 of Figure 1 showing the position of the machine at the beginning and the end of its operating cycle;

Figure 3 is a view similar to Figure 2 showing the machine in position at the end of the forward stroke of the cycle at which point the glue is transferred to the sheets; and

Figure 4 is a view taken along line 4—4 of Figure 3 showing the actuating mechanism.

Referring now in particular to Figures 1 and 2 of the drawing, it will be seen that work table 10 is provided with a flat top 12 having a plurality of longitudinally extending spaced parallel slots 14. In the preferred construction plates 16 are placed in spaced parallel relation to one another overlying the table top with the spaces therebetween coinciding with the slots, as shown. A pile of paper 18 to be glued is placed upon the plates and held in the desired longitudinal position relative to the table by pins 20 which extend upwardly through the slots in the table top and are fastened to transversely extending longitudinally adjustable bars 22 on the underside of the table top. The two adjustable bars 22 are held against the underside of the table top by means of thumb screws 24 which are adapted to slide longitudinally within one of the parallel slots 14. The pins 20 engage the sides of the paper pile 18 and are adjustable to any longitudinal position on the face of the table top to retain the paper pile in correct position.

2

Longitudinally extending, transversely adjustable stops 26 and 28 are provided on the table top and used to engage the top and bottom edges of the paper pile 18 to position the paper pile in the desired transverse position relative to the table.

A glue trough 30 is mounted to the rear of and above the paper pile parallel to the adjacent edge thereof. The front side of the glue trough 30 is provided with pins 32 at each end which fit into notches 34 in supporting brackets 36. The rear side of the glue trough is provided with an internally threaded collar 38 into which is threaded screw 40. The lower end of screw 40 rests upon the surface of the table top and adjustment thereof within the threaded collar causes the glue trough to tilt about pins 32 located at the forward portion of the trough. The word "glue" as used herein is intended to mean any of the many adhesives suitable for use in making collated forms.

With particular reference now to Figures 1, 2 and 3 of the drawing, it will be seen that the machine is provided with a U-shaped operating arm 42 which moves in an arcuate path forwardly and rearwardly between the positions shown in Figures 2 and 3. The operating arm 42 moves within slot 44 in the rear edge of the table and the lower stem 46 of the operating arm is operatively connected to an actuating mechanism indicated in a general way by numeral 48. Upper stem 50 of the operating arm is positioned above the table top and provides a support for the gluing assembly, indicated in a general way by numeral 52. The gluing assembly 52 is supported on the forward end of upper stem 50 of the operating arm by a vertically adjustable supporting arm 54. Three longitudinally extending rods 56, 58 and 60 are carried on the lower end of supporting arm 54 in spaced parallel relation to one another and parallel to the plane of the table top. A plurality of L-shaped glue receiving fingers 62 are mounted on the middle rod 56 for pivotal movement in spaced longitudinal relation. The rearmost of the three rods 60 provides a stop to limit the rearward pivotal movement of the L-shaped glue receiving fingers and the forwardmost rod 58 acts as a stop to limit the forward pivotal movement of the glue fingers. The arrangement of the gluing assembly 52 with respect to the glue trough 30 is such that the tapered tips 64 of the glue fingers will dip into the glue trough when pivoted rearwardly against rod 60 which is the operative position of the fingers. When the glue fingers are pivoted forwardly against rod 58 they lie in inoperative position as they cannot pick up and transfer any glue.

In connection with Figure 1, it will be seen that only those glue fingers which will impinge upon the paper when the operating rod is moved to the position shown in Figure 3 are placed in the operative position; whereas, the glue fingers which lie beyond the sides of the paper pile are placed in inoperative position. When the operating arm is in the position shown in Figure 2, the tapered tips 64 of the operating glue fingers will be immersed in the glue within the glue trough if the glue fingers are in operative position. The depth to which the tapered tips are immersed in the glue trough is controlled by adjustment of screw 40 within threaded collar 38 which tilts the glue trough relative to the glue fingers. Thus, the quantity of glue picked up by the tapered tips of the glue fingers is controlled by tilting the glue trough. As the operating arm carries the glue fingers to the position shown in Figure 3, those fingers which have been placed in operative position transfer the glue from the trough to the desired position on the paper in a line of longitudinally spaced glue spots. The pivotal connection between the fingers and the center rod 56 enables the operative glue fingers to be raised above stop rod 60 to adjust for the thickness of the paper pile 18.

The actuating mechanism 48 by which the forward and rearward arcuate movement of the operating rod 42 is accomplished, will now be described in detail in connection with Figures 2, 3 and 4 of the drawing. The entire actuating mechanism is mounted on a sideplate 66 which is provided with a portion 68 extending at right angles from the upper edge thereof which forms means for suspending the sideplate and actuating mechanism attached thereto from the underside of the table top 12. The lower stem 46 of the operating arm is connected to parallel arms 70 and 72, shown most clearly in Figure 4, for arcuate movement in the direction of arrows A and A' of Figures 2 and 3. The lower ends of the arms are mounted on the sideplate for pivotal movement about pivots 74 and 76; and, the upper ends of the arms are connected to stem 46 of the operating arm for pivotal movement about pivots 78 and 80. The arms control the arcuate path followed by the operating arm from the position shown in Figure 2 in which the glue fingers are immersed in the glue trough, to the position shown in Figure 3 where the glue fingers impinge upon the paper and back again. The sideplate is provided with motor brackets 82 and 84 which support a conventional vacuum motor 86 of the type used to operate automobile windshield wipers. Vacuum line 88 connects the vacuum motor to a vacuum pump, not shown. The vacuum motor 86 is positioned with respect to the lower stem 46 of the operating arm in a manner such that rocker arm 90 which interconnects the shaft 92 of the motor and pivot 80 of the operating arm will cause the operating arm to move through the arcuate path A and A'. Rocker arm 90 is rigidly connected to shaft 92 of the motor and oscillates back and forth in the conventional manner causing the glue fingers to move from the glue trough to the paper and back again as aforementioned.

Intermittent cyclic operation of the vacuum motor is accomplished by means of a structure which will now be described in detail. Vacuum motor 86 is of the conventional type having a slide valve 94 which when moved from the position shown in Figure 3 to the position shown in Figure 2 will open and permit a vacuum to be created on one side of movable vane 96 within the vacuum motor. The conventional design of the vacuum motor is such that with the slide valve open as shown in Figure 2, the rocker arm 90 will move through its entire forward stroke to the position shown in Figure 3, whereupon the slide valve may be closed and the rocker arm will automatically return to its original position. Thus, intermittent cyclic operation of the gluing machine can be accomplished by opening the slide valve to begin the stroke of the rocker arm and leaving the slide valve open until the forward stroke thereof is completed. As soon as the rocker arm reaches its extreme forward position, movement of the vane inside the motor causes the slide valve to be by-passed automatically and the vacuum transferred to the opposite side of the vane 96 which reverses the direction of the rocker arm, whereupon the rocker arm makes its return stroke to its original position and stops. Closing of the slide valve following termination of the forward stroke of the rocker arm has no effect on the return stroke which takes place automatically. Therefore, stem 46 of the operating arm is provided with a trigger rod 98 which contacts and closes slide valve 94 near the completion of the forward stroke of the rocker arm as shown most clearly in Figure 3. When the rocker arm completes the return stroke and is again in its original position, movement of the vane in the motor reconnects the slide valve into the vacuum line, whereupon the slide valve again becomes operative to close the vacuum inlet and prevent the rocker arm from beginning another cycle of operation until the slide valve is again opened.

Slide valve 94 is moved from closed to open position by means of pivot arm 100 which is mounted for pivotal movement on motor bracket 84, as shown. Spring 102 is attached to the pivot arm and acts to resist opening

of the slide valve. Pivot arm 100 is provided with a stop 104 which acts against the motor bracket 84 to limit the movement of the pivot arm in a direction to open the slide valve. The actuating mechanism is provided with a foot pedal 106 which is connected to the end of pivot arm by link 108.

Operation

In order to operate the gluing machine of the present invention, a pile of paper is placed upon the table top in the correct longitudinal and transverse position relative thereto to receive the operative glue fingers along the desired line as shown in Figure 3. The paper is held in this position by pins 20 and the transversely adjustable stops 26 and 28. The glue trough is then tilted relative to the glue fingers so that the correct amount of glue will be picked up thereby and transferred to the paper.

Pressure upon foot pedal 106 acts through link 108 to move the pivot arm 100 and open the slide valve 94. As soon as the pressure on the foot pedal is released the spring 102 returns the pivot arm to its original position. When the slide valve is opened, as shown in Figure 2, a vacuum is created on one side of vane 96 of the vacuum motor which causes the rocker arm 90 to move through its forward stroke into the position shown in Figure 3. The forward stroke of the rocker arm is transmitted through pivot 80 to operating arm 42, causing the operating arm to move in an arcuate path determined by parallel arms 70 and 72. Forward movement of the operating arm causes the glue fingers to be lifted from the glue trough and moved to a point where they impinge upon the paper and deposit the glue.

Immediately prior to the time the rocker arm reaches the end of its forward stroke, trigger rod 98 engages the slide valve 94 and moves it from open to closed position. Completion of the forward stroke of the rocker arm, however, automatically by-passes the slide valve and shifts the vacuum from one side of the movable vane 96 to the other so that the rocker arm will be returned to its original position even though the slide valve is closed. As soon as the actuating arm reaches its original position, the motor again acts automatically to connect the slide valve into the vacuum line. The slide valve is now in a closed position, however, which prevents the start of another cycle until such time as the slide valve is again opened.

Reference during the detailed description has been made only to multi-leaf forms and piles of paper, but it is to be understood that the machine is designed for affixing a glue line to successive layers of original forms, carbons and copies for binding together into what is commonly called the "snap-out form." In the claims, the term "sheets" is meant to include such paper forms.

It can be appreciated from the foregoing disclosure that the present machine readily accomplishes the objects outlined. Being aware of various possible modifications, I desire it to be understood that the scope of my invention is not to be limited to any specific disclosure, but is to include the fundamental principles involved as defined by the structural terms and equivalents of the appended claims.

I claim:

1. A gluing machine comprising a table on which sheets may be stacked in fixed position, an adhesive reservoir containing an adhesive, a movable supporting frame having a rod positioned above the adhesive reservoir, a plurality of glue receiving fingers mounted on the rod for pivotal movement in spaced relation to one another, said fingers being normally immersed in the adhesive in the adhesive reservoir, stop means carried by the supporting frame for limiting the downward pivotal movement of the glue receiving fingers into the adhesive reservoir, and drive means operatively connected to the supporting frame for imparting intermittent, cyclic oscillatory movement to the frame and glue receiving fingers carried thereby for moving the glue receiving fingers from the adhesive reser-

5

voir to the sheets and back again during each cycle of operation whereby adhesive may be applied to the sheets.

2. A gluing machine comprising a table on which sheets may be stacked in fixed position, a glue reservoir containing glue, a movable supporting frame having a rod positioned above the glue reservoir, a plurality of substantially L-shaped glue receiving fingers mounted on the rod for pivotal movement in spaced relation to one another, the tips of the L's furthest removed from the mounting on the rod being immersed in the glue in the glue reservoir, stop means carried by the supporting frame for limiting the downward pivotal movement of the glue receiving fingers into the glue reservoir, and drive means comprising a windshield wiper type vacuum motor operatively connected to the supporting frame for imparting cyclic oscillatory movement to the frame and glue receiving fingers carried thereby in order that the glue receiving fingers may be moved from the glue reservoir to the sheets and back again during each cycle of operation of the vacuum motor.

3. A gluing machine comprising a table on which sheets may be stacked in fixed position, a glue reservoir containing glue, a movable supporting frame having a rod positioned above the glue reservoir, a plurality of glue receiving fingers mounted on the rod for pivotal movement in spaced relation to one another, said fingers being immersed in the glue in the glue reservoir, stop means carried by the supporting frame for limiting the downward pivotal movement of the glue receiving fingers into the glue reservoir, adjustment means supporting the glue reservoir for varying the depth at which the glue receiving fingers become immersed in said reservoir, and drive means operatively connected to the supporting frame for imparting cyclic oscillatory movement to the frame and glue receiving fingers carried thereby for moving the glue receiving fingers from the glue reservoir to the sheets and back again during each cycle of operation.

4. A gluing machine comprising a table on which sheets may be stacked in fixed position, a glue trough containing glue, a movable supporting frame carrying a front, middle and rear rod above the glue trough in spaced parallel relation, a plurality of glue receiving fingers mounted on the middle rod for independent pivotal movement in spaced relation to one another, pivotal movement of said fingers in one direction causing said fingers to become immersed in the glue in the glue trough, one of said front and rear rods acting as a stop to limit the pivotal movement of the glue receiving fingers in the direction to enter the glue trough, and the other of said rods acting to limit the pivotal movement of the glue receiving fingers in the other direction to support said fingers in inoperative position, adjustment means supporting the glue trough for varying the depth at which the glue receiving fingers become immersed in the glue, and drive means comprising a windshield wiper type vacuum motor operatively connected to the supporting frame for imparting cyclic oscillatory movement to the frame and glue receiving fingers carried thereby in order that the glue receiving fingers

6

may be moved from the glue trough to the sheets and back again during each cycle of operation of the vacuum motor.

5. A gluing machine comprising a table on which sheets may be stacked in fixed position, a glue trough containing glue, a movable supporting frame having a rod positioned above the glue trough, a plurality of substantially L-shaped glue receiving fingers mounted on the rod for independent pivotal movement in spaced relation to one another, the tips of the L's furthest removed from the mounting on the rod being immersed in the glue in the glue trough when pivoted in one direction, stop means carried by the supporting frame for limiting the pivotal movement of the L-shaped fingers in the direction to immerse the bases thereof in the glue, stop means carried by the supporting frame for limiting the pivotal movement of the L-shaped fingers in the opposite direction in order that said fingers may be placed in inoperative position, and drive means operatively connected to the supporting frame for moving the L-shaped fingers from the glue trough to the sheets and back again.

6. In a gluing machine of the type having a glue reservoir, a glue transfer mechanism positioned to receive glue from the reservoir, and a drive mechanism operatively connected to the glue transfer mechanism for moving said mechanism from the glue reservoir to a stack of sheets, the improved glue receiving mechanism which comprises a supporting rod operatively connected to the drive means and positioned above the glue reservoir, a plurality of substantially L-shaped glue receiving fingers mounted on the rod for independent pivotal movement in spaced parallel relation to one another, the tips of the L's furthest removed from the mounting on the rod being immersed in the glue reservoir, and stop means for limiting the degree of immersion of the glue receiving fingers in the glue reservoir.

7. A gluing machine comprising a support on which a plurality of paper sheets may be stacked, adhesive supply means, means for transferring adhesive from the supply means to the sheets, said transferring means including movable means mounted on the support and a plurality of adhesive receiving fingers pivotally mounted on the movable means, drive means operatively connected to the movable means for moving the fingers from the supply means to the sheets and back again whereby adhesive may be applied to the sheets, said fingers being mounted in spaced relation to one another, and means for limiting the downward pivotal movement of the fingers.

References Cited in the file of this patent

UNITED STATES PATENTS

694,915	Gilfillan et al.	Mar. 4, 1902
748,428	Simonson	Dec. 29, 1903
2,113,690	Harrington	Apr. 12, 1938
2,203,572	Johnson	June 4, 1940
2,546,522	Quackenbush	Mar. 27 1951
2,665,661	Searle	Jan. 12, 1954
2,730,991	Baughan	Jan. 17, 1956