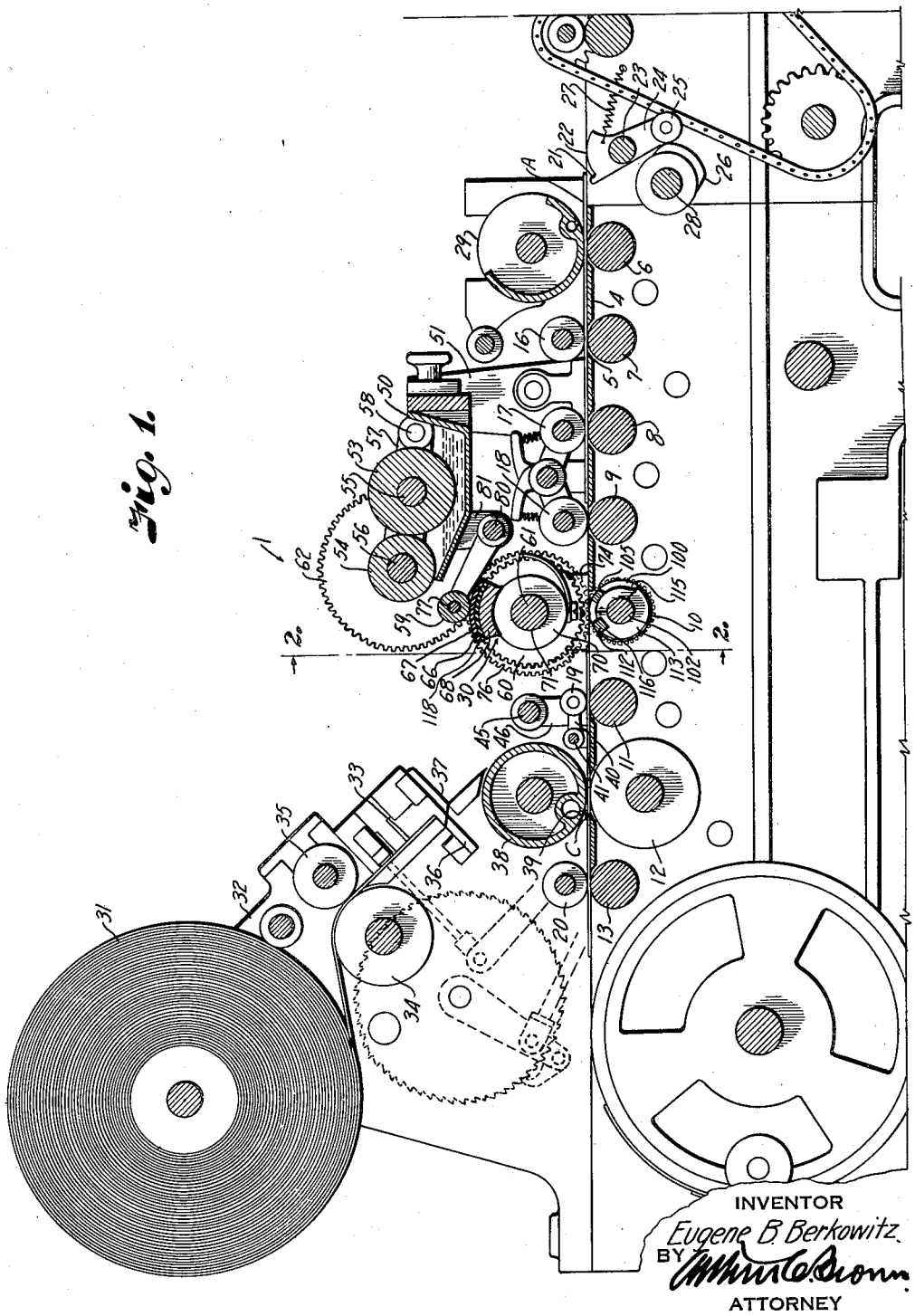
April 23, 1935. E. B. BERKOWITZ 1,998,701

MECHANISM FOR APPLYING ADHESIVE TO WINDOW ENVELOPE BLANKS

Filed June 8, 1933 3 Sheets-Sheet 1

Fig. 1.



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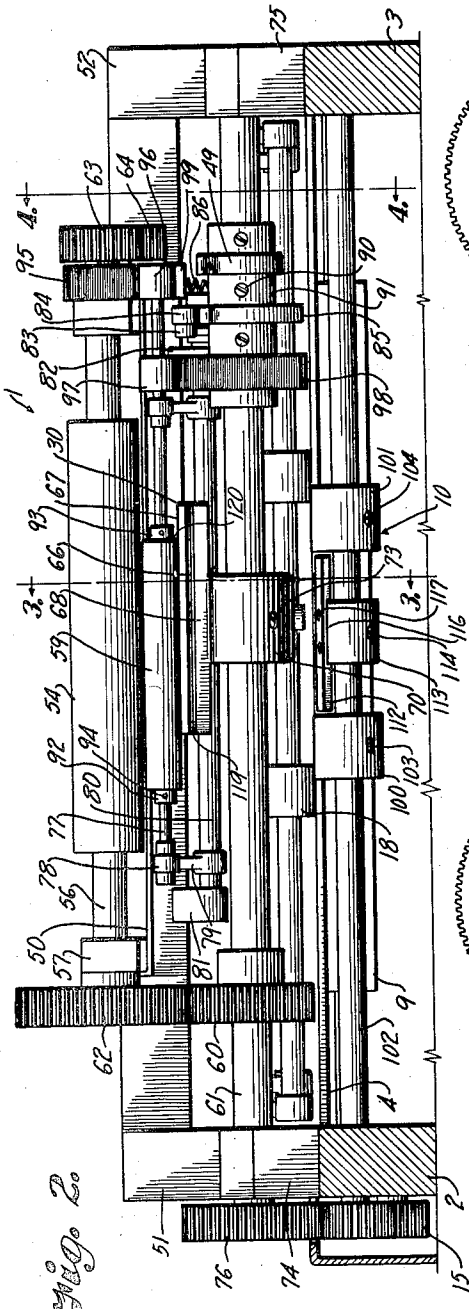


Fig. 2.

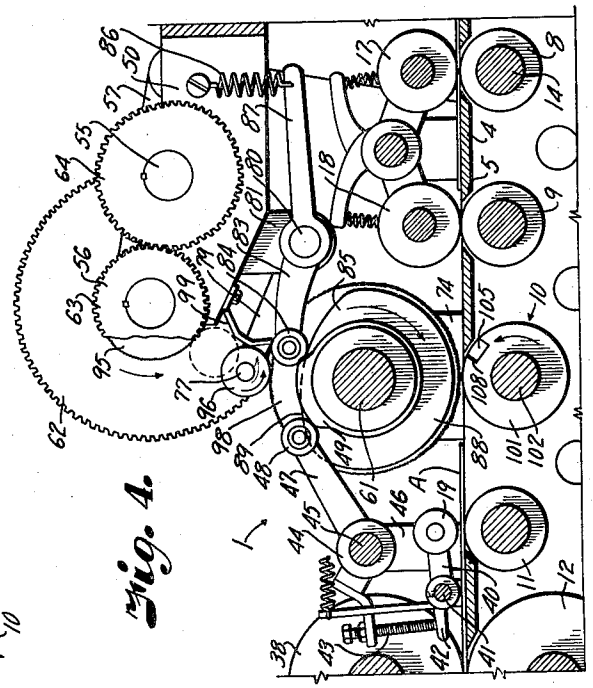


Fig. 4.

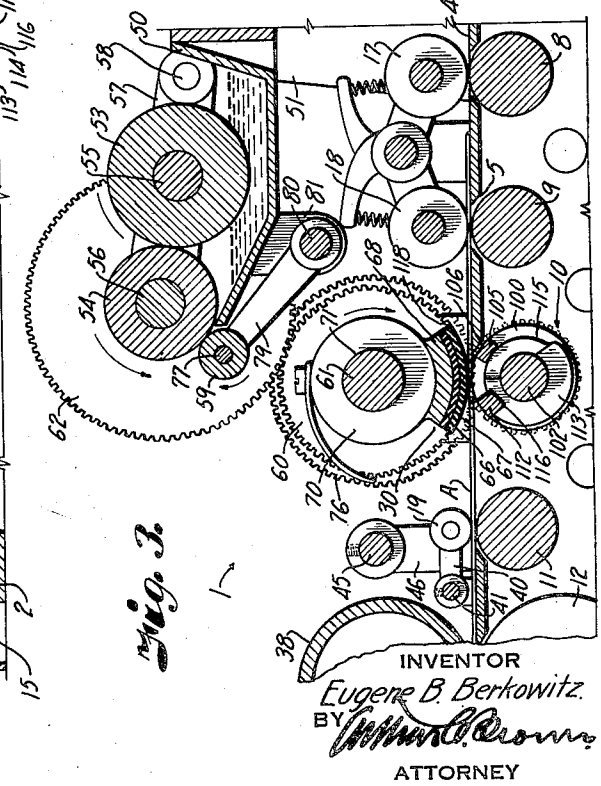


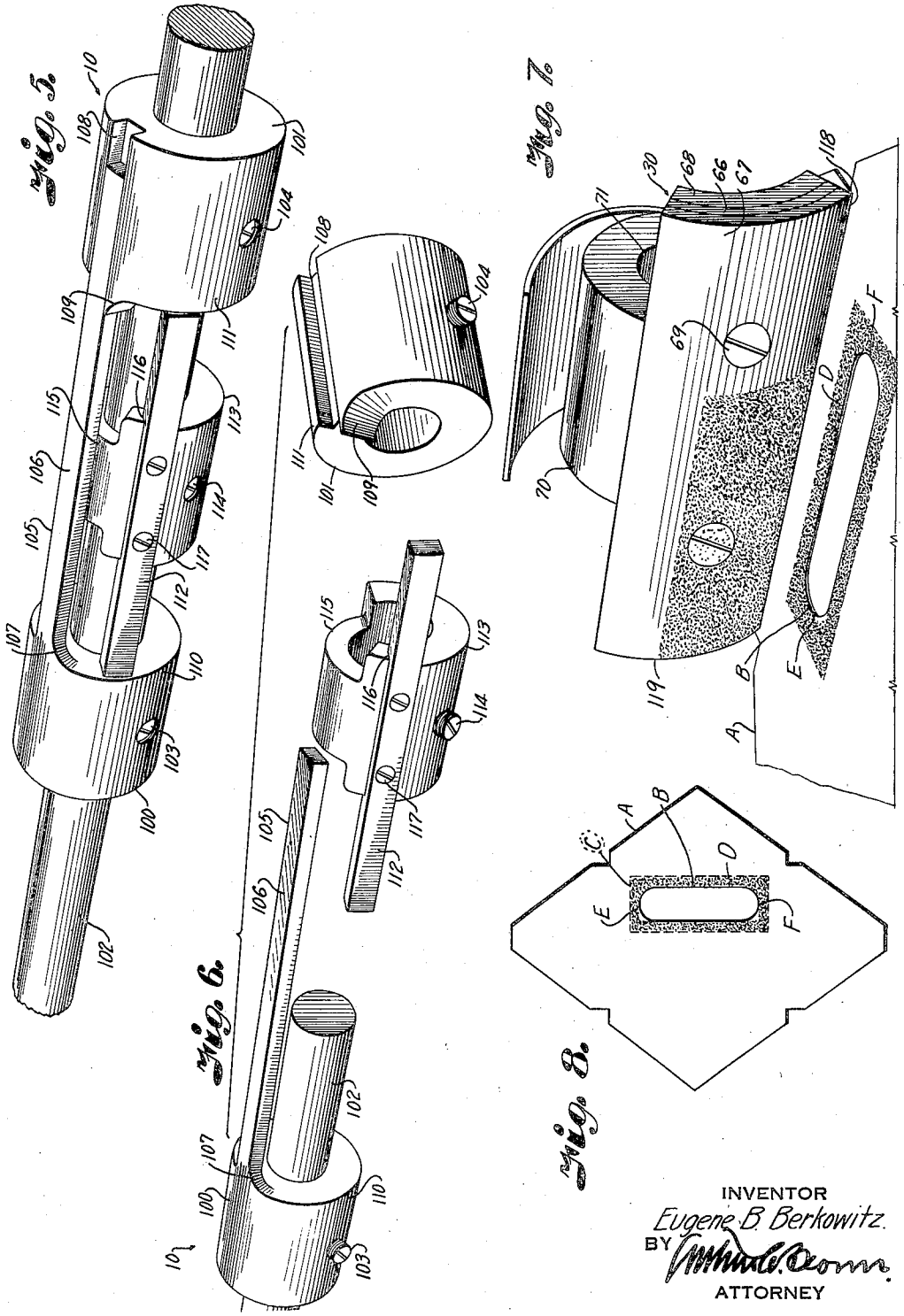
Fig. 3.

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UNITED STATES PATENT OFFICE

1,998,701

MECHANISM FOR APPLYING ADHESIVE TO WINDOW ENVELOPE BLANKS

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Application June 8, 1933, Serial No. 674,883

14 Claims. (Cl. 93—68)

My invention relates to a machine for manufacturing window envelopes and more particularly to that portion of the machine for applying an adhesive to the window opening of the envelope blanks to attach the transparent window patches, and has for its principal object to readily adapt the adhesive applying mechanism to various type blanks having different sized and located window openings.

Other important objects of the invention are to control application of the adhesive so that the window strip is firmly secured up to and around the edge of the window openings, and to provide for off-setting the adhesive from a distributing roller onto a selective location of an applicator which then applies adhesive to the blanks.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a longitudinal section through the patch applying portion of an envelope machine equipped with an adhesive applying mechanism constructed in accordance with my invention.

Fig. 2 is a cross section on the line 2—2, Fig. 1.

Fig. 3 is an enlarged detail sectional view through the adhesive applying mechanism on the line 3—3, Fig. 2.

Fig. 4 is an end elevational view of the adhesive applying mechanism particularly illustrating the cam for controlling the extent of contact of the distributing roller with the adhesive applicator.

Fig. 5 is an enlarged detail perspective view of the platen roller which cooperates with the applicator in applying the adhesive to the window openings of the blanks.

Fig. 6 is a similar view showing the parts of the platen in disassembled spaced relation to better illustrate their construction.

Fig. 7 is an enlarged perspective view of the adhesive applicator illustrating the application of adhesive over the window opening of an envelope blank.

Fig. 8 is a plan view of a window envelope blank showing the adhesive applied to the window opening.

Referring more in detail to the drawings:

1 designates the patch applying portion of a machine for manufacturing transparent window envelopes and includes spaced side frame members 2 and 3 carrying a horizontal work supporting plate 4 having spaced transverse openings 5 in which are rotatably mounted rollers 6 to 13, inclusive, having their peripheries located in substantial alignment with the top of the plate 5. The rollers 6 to 13 are mounted on shafts 14 having their ends rotatably mounted in suitable bearings in the side frames and are synchronously operated by suitable gearing, as indicated at 15, Fig. 2.

Cooperating with the rollers 7, 8, 9, 11 and 13, are pressure rollers 16, 17, 18, 19 and 20 for retaining the blanks in contact therewith to assure positive travel of the blanks through the machine.

The rollers thus provide means for forwarding the envelope blanks "A" along the table and through a definite path of travel at a predetermined speed to receive the adhesive about the window opening "B" and a transparent patch "C" which is applied over the adhesive.

In order to time the blanks relatively to the adhesive and patch applying mechanism, the blanks are momentarily stopped prior to their delivery over the roller 6 by stop fingers 21 that are projectable across the paths of travel of the blanks to time them in relation to the adhesive applying mechanism. The stop fingers 21 are carried on arcuate heads 22 that are rotatably mounted on a counter-shaft 23 having its ends rotatably mounted in the side frames 2 and 3. Depending from the heads 22 are lever arms 24 having rollers 25 which are retained in rolling contact with cams 26 by tension springs 27. The cams 26 are fixed to a counter-shaft 28 operable in timed relation with the forwarding rollers that advance the blanks through the machine.

Cooperating with the rollers 6 is a gripping roller 29 arranged to grip the sealing flap portions of the blanks approximately at the time the blanks are momentarily detained by the fingers 21.

Thus, when the gripping roller engages the blank, the window opening therein is then in timed relation with the adhesive applying mechanism, so that when the opening of the blank is moving over the roller 10, an adhesive applicator 30 is moving into contact therewith to apply adhesive about the window openings for receiving the patch that is applied as the blank passes over the roller 12.

In the machine illustrated, the patch material is in the form of a continuous strip wound in a roll 31 that is rotatably supported on a bracket 32 extending upwardly from the side frames of the machine and is delivered across a table 33 by feed rollers 34 and 35 intermittently operated in timed relation with the forwarding rollers for feeding measured quantities of the strip depend-

ing upon the width of the window openings of the blanks. When the required amount of material is fed by the rollers 34 and 35, shear blades 36 and 37 are operated through a slotted opening in the table to cut a patch having the required size to properly overlap the window opening. The patch is delivered to the blank by a vacuum roller 38 that is rotatably mounted above the roller 12 and which is provided with a nozzle 39 in position for engaging the front edge of the patch and to carry it into sealing contact with a blank as the blanks are delivered over the roller 12.

At the time the blank is gripped by the roller 12, the pressure rollers 19 are lifted from contact with the blank so that the blank is free from pressure thereof and under control of the rollers 12 and 38.

The pressure rollers 19 are rotatably mounted on the ends of lever arms 40 pivotally mounted on a cross shaft 41 and which have finger portions 42 adapted to be engaged by adjusting screws 43 carried on a rocking lever 44.

The rocking lever 44 is mounted on a cross shaft 45 having its ends carried in brackets 46 extending upwardly from the side frames 2 and 3, as shown in Fig. 4. The rocking lever 44 also includes a forwardly extending arm 47 carrying a roller 48 engaging a cam 49 on the applicator shaft, later described.

The structure thus far described is that of a known type of envelope making machine and specifically forms no part of the present invention, the present invention being directed to the mechanism for applying adhesive to the blanks through the applicator 30.

The adhesive applying mechanism includes an adhesive containing pan 50 supported above the forwarding rollers 8 and 9 on brackets 51 and 52 extending upwardly from the side frame members 2 and 3. Rotatably mounted within the pan 50 is a pick-up roller 53 having its periphery moving in contact with the adhesive to gather up and deliver adhesive to a transfer roller 54 which rotates in contact therewith. The rollers 53 and 54 are carried on shafts 55 and 56 having their ends rotatably mounted in arms 57 pivoted to the opposite side walls of the pan on pins 58.

The transfer roller 54 is of sufficient diameter to project beyond the edge of the pan in position to be engaged by a distributing roller 59 which delivers the adhesive to the applicator, as later described.

The rollers 53 and 54 are driven by a gear 60 on the applicator shaft 61 which meshes with a gear 62 on the shaft of the roller 54 which carries a gear 63 meshing with a gear 64 on the shaft of the pick-up roller.

Owing to the fact that it is necessary to produce a variety of types and sizes of envelopes with each variety having the window openings located in different positions in the blanks, and the openings of different length and widths, I provide means whereby the adhesive is applied to a selective area of a specially constructed applicator, in conformity to the shape and size of the patch to be applied.

In carrying out my invention, the applicator includes a pad 66 having an arcuate face 67 of sufficient length and width to accommodate an area of adhesive suitable for the largest sized opening of any blank that is to be passed through the machine and to provide means for regulating extent of contact of the distributing roller therewith, so that proper sized and shaped extent of adhesive is deposited thereon, as now to be described.

The pad 66 is supported upon an arcuate plate 68 and secured thereto by screws 69 extending through counter-sunk openings in the pad and into threaded sockets in the plate.

The plate also includes an integral collar or sleeve 70 having a through bore 71 to slidably mount the applicator upon the applicator shaft 61, whereby the applicator may be adjusted longitudinally on the shaft. After the longitudinal adjustment is made, the applicator is secured to the shaft by a set screw or similar clamping device 73.

The applicator shaft 61 is rotatably mounted above the roller 10 in bearings 74 and 75 carried on the side frames 2 and 3, so that the arcuate face thereof planetates in contact with each blank as the blanks are consecutively moved through the machine, the applicator shaft being driven by a gear 76 thereon meshing with the gearing driving the forwarding rollers, as shown in Fig. 2.

The distributing roller 59 is fixed upon a shaft 77 rotatably mounted in bearings 78 carried at the ends of arms 79 that are fixed to a rock shaft 80. The shaft 80 is rotatably supported in bearings 81 and 82 depending from the bottom of the adhesive pan 50 and is provided with a rocker arm 83 having a roller 84 engaging a cam 85 on the applicator shaft.

The roller 84 on the arm 83 is normally retained in engagement with the cam 85 by a spring 86 having one end fixed to the pan and its opposite end to the free end of an arm 87 also fixed to and projecting from the shaft 80.

The cam 85 has a high lobe portion 88 to cause movement of the distributing roller into contact with the transfer roller 54 and has a low lobe portion 89 to permit the spring 86 to draw the distributing roller into contacting relation with the applicator.

In order that the extent of engagement of the distributing roller with the applicator may be regulated to the width of the patch to be applied, the cam 85 is adjustably fixed on the applicator shaft by a set screw 90 threaded through a collar 91 on the cam and into engagement with the applicator shaft.

It is thus apparent that when the cam 85 is shifted on the shaft, the extent of engagement of the carrying roller will be varied relatively to the applicator so that the adhesive can be applied to any portion of the width of the applicator by setting position of the cam.

In order to adjust the length of adhesive applied to the applicator, the distributing roller is adjustable longitudinally on its shaft so as to control the longitudinal contact thereof with the applicator, as shown in Fig. 2, and is retained in adjusted position by stop collars 92 and 93 fixed to the shaft by set screws 94.

In order to insure uniform distribution of adhesive on the distributing roller, the distributing roller is rotated during its contact with the transfer roller. This is accomplished by providing the transfer roller 56 with a pulley 95 which engages a resilient pulley 96 on the shaft of the distributing roller 59.

Likewise, to assure uniform deposit of adhesive on the applicator, the distributing roller carries a second resilient pulley 97 that engages a pulley 98 on the applicator shaft.

Attention is directed to the fact that the distributing roller rotates in an anti-clockwise di-

rection Fig. 4, when it engages the applicator and in a clockwise direction when it engages the transfer roller. Consequently, it is necessary for the roller to change its direction of travel during its movement between the respective members.

In order to reverse rotation of the distributing roller during its movement to and from the distributing roller, the bottom of the pan carries a track 99 supported in the path of travel of the pulley 96 so that as the pulley rolls on the track, its rotational direction is reversed to conform to the rotational direction of the applicator, or the transfer roller, depending upon the movement of the distribution roller under influence of the cam 85.

The roller 10 serves as a platen to cooperate with the applicator in applying adhesive to the blanks and for this reason must also be made adjustable to correspond to the extent of the adhesive applied, in order to support the blanks at the side and end edges of the window openings. To accomplish this, the roller includes spaced collars 100 and 101 fixed to the shaft 102 by set screws 103 and 104, respectively.

The collar 100 carries a fixed platen bar 105 extending laterally therefrom in parallel relation with the shaft 102 with the upper face 106 thereof positioned in the plane of the periphery of the collar. The juncture of the bar with the collar is filleted, as at 107, to substantially correspond to the curvature at the ends of the window openings, as clearly shown in Figs. 5 and 6. The free end of the platen bar is slidably supported in a groove 108 formed in the periphery of the collar 101 and the collar is provided with a fillet 109 corresponding to the fillet 107.

The adjacent ends 110 and 111 of the collars and the bar 105 form supports for the blanks at the ends and one side of the window openings and in order to provide support at the other side, I provide a bar 112 fixed to a collar 113 also fixed on the shaft 102 by a set screw 114. The collar 113 is of slightly smaller diameter than the collars 100 and 101 and has a part of the periphery cut away, as at 115, to accommodate the bar 105.

The bar 112 is removably retained in a grooved seat 116 in the collar by screws 117 to permit bars of different length to be inserted to correspond to the length of spacing between the collars.

Assuming that the adhesive applying mechanism is constructed and assembled on an envelope making machine as described, the adjustments for operating on envelope blanks to apply adhesive about the window openings therein are as follows:

The applicator 30 is set in timed relation with the forward travel of the blanks so that upon each revolution thereof, the retractive edge 118 of the pad 66 overlaps the rear longitudinal edge "D" of the window opening equal to the width of the margin of adhesive to be applied to the blank. The applicator is also adjusted longitudinally on a shaft 61 so that the side edge 119 thereof overlaps the end "E" of the window opening corresponding to the width of the margin of adhesive to be applied to the blank.

The distributing roller 59 is then adjusted on its shaft 77 by moving the collars 92 and 93 so that the end 120 of the roller overlaps the pad 66 a distance equal to the length of the patch to be applied to the window openings of the blanks.

The cam 85 is then adjusted on the shaft 61 so that the extent of contact of the distributing roller with the pad of the applicator is equal to the width of the patch to be applied.

The platen roller 10 is next adjusted by spacing the collars 100 and 101 on the shaft 102 so that the inner ends thereof substantially align with the ends "E" and "F" of the window openings.

A platen bar 112 is then applied to the collar 113 which is of proper length to bridge the spacing between the collars 100 and 101 and the collar 113 is adjusted on the shaft 102 so that the spacing between the platen bars 105 and 112 is substantially equal to the width of the openings in the blanks.

The platen roller is then timed so that as the forward edge of a window opening reaches the roller 10 the retractive side of the platen bar 112 will align therewith and the advancing side of the bar 105 will align with the rear edge of the opening.

The adjustments of the adhesive applying mechanism are then completed and the machine is ready for operation after the other adjustments necessary in the other parts of the machine have been made to conform to the size and type of blanks being run therethrough, but which forms no part of the present invention.

The blanks are consecutively delivered through the machine as in customary practice and as they engage the fingers 21 they are momentarily stopped to be timed with the adhesive applying mechanism. The fingers are then moved away from engagement with the stopped blank to permit the gripping roller 29 to move it between the forwarding rollers 7, 8 and 9, aided by the pressure rollers 16, 17 and 18, so that the blank is passed over the platen roller 10 to receive adhesive that has been deposited on the pad of the applicator, as now to be described.

The pick-up roller 53 will gather the adhesive on the surface thereof and transfer it to the roller 54. The distributing roller 59 is moved into peripheral contact with the transfer roller and is rotated therewith by inter-engagement of the pulleys 95 and 96, so that the surface of the distributing roller is covered with adhesive, the distributing roller having been moved into contact with the transfer roller by the cam 85.

As the cam continues its rotation, the spring 68 will cause the lever 87 to rock the shaft 89 to move the distributing roller 59 into position for contacting the pad of the applicator.

During movement of the distributing roller from contact with the transfer roller, the pulley 96 thereon will move across the track 99 to reverse rotation of the distributing roller so that it is rotating in a counter-clockwise direction, Fig. 4, when it contacts the applicator which is rotating in a clockwise direction.

When the distributing roller engages the pad 66 adhesive starts to be transferred from the distributing roller onto the pad of the applicator and when the distributing roller rides off the rear edge 118 of the applicator the proper width of adhesive is applied to the pad which is equivalent to the width of the patch to be applied. Continued rotation of the applicator carries the pad into contact with the blank so that a margin of adhesive is applied entirely around the window opening thereof, the edges of the window opening being supported by the platen bars 105 and 112 and by the peripheries of the ends of the collars 100 and 101.

Owing to the fact that the facing edges of the platen bars align with the inner edges of the openings in the blanks, the adhesive will be ap-

plied in close relation with the edges of the window opening so that when the patch is applied there are substantially no loose edges around the opening.

After that particular type of blank has been run through the machine and it is desirous to run another type having different length and width openings, all that is necessary is to adjust the relative contact areas of the applicator and distributing rollers and the platen to conform with the size of the window openings and the path of travel through which the blanks are moved in the machine.

From the foregoing, it is apparent that I have provided an adhesive applying mechanism which is simple of adjustment to conform to any widths of window openings or location of the openings in the blanks.

What I claim and desire to secure by Letters Patent is:

1. A device for applying adhesive to work pieces of the character described including means for advancing the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contacting the work pieces, means for distributing adhesive to a selective portion of the applicator, and a platen cooperating with the applicator and having adjustably spaced contact portions to conform to said selective portion of the applicator.

2. A device for applying adhesive to work pieces of the character described including means for advancing the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contact with the work pieces, means associated with the applicator for distributing adhesive thereto, and means controlling the said distributing means to apply the adhesive to a selective portion of the applicator.

3. A device for applying adhesive to selective portions of work pieces including means for advancing the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contact with the work pieces, an adhesive distributing roller, means supporting the distributing roller for intermittent contact with the applicator, and means operating in timed relation with the applicator to selectively control the extent of contact of the distributing roller with the applicator.

4. A device for applying adhesive to selective portions of work pieces including means for advancing the work pieces through a fixed path, an adhesive applicator, means rotatably supporting the applicator for rotary contact with the work pieces, an adhesive distributing roller, means for supporting the distributing roller in contacting relation with the applicator, and means operating in timed relation with the applicator to regulate extent of contact of the distributing roller for applying adhesive to a selective portion of the applicator.

5. A device for applying adhesive to work pieces of the character described including means for moving the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contacting the work pieces, means contacting the applicator for distributing adhesive thereon, means operable in synchronism with the applicator for controlling the extent of contact of the distributing means with the applicator, a platen cooperating with the applicator, and means for adjusting the platen to a width corresponding to the extent of engagement of said distributing means with the applicator.

6. A device for applying adhesive to work pieces of the character described including a support, means on the support for advancing the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contacting the work pieces, an adhesive supplying roller carried by the support, a distributing roller, means for mounting the distributing roller on the support for movement to and from contacting relation with the supplying roller and the applicator to carry adhesive from the supplying roller to the applicator, a cam on the applicator for moving the distributing roller and controlling extent of engagement thereof with the applicator, and a platen carried by the support for supporting the work pieces in contact with the applicator.

7. A device for applying adhesive to selective portions of work pieces including a support, means on the support for advancing the work pieces through a fixed path, an adhesive applicator carried by the support for contacting the work pieces to apply adhesive thereto, an adhesive carrying pan carried by the support above the applicator, an adhesive pick-up roller mounted in the pan, a transfer roller contacting the pick-up roller, a distributing roller, means for supporting the distributing roller for movement to and from contact with the transfer roller and the applicator, a cam operable in synchronism with the applicator for operating the distributing roller and controlling extent of engagement of the distributing roller with the applicator, and means carried by the support for changing the direction of rotation of the distributing roller during its movement to and from contact with the transfer roller and the applicator.

8. In a machine of the character described, an adjustable platen including a shaft, spaced collars on the shaft, a platen bar fixed to one of the collars and slidably mounted in the other collar, a second platen bar, and means for supporting the second platen bar on the shaft in selective spaced parallel relation with the first named platen bar.

9. A device for applying adhesive to envelope blanks having window openings to be covered by a transparent patch including means for advancing the blanks through a fixed path, an adhesive applicator, means supporting the applicator for contacting the blanks, means for applying adhesive to a selective portion of the applicator conforming in shape and extent to the patch to be applied, a platen cooperating with the applicator including bars, and means for adjustably supporting one of the bars on the platen in spaced relation with the other bar to conform to the extent of the adhesive as applied to the applicator.

10. A device for applying adhesive to selective portions of work pieces including means for advancing the work pieces through a fixed path, an adhesive applicator, means supporting the applicator for contacting the work pieces, an adhesive distributing roller, means supporting the distributing roller for intermittent contact with the applicator, means operating in timed relation with the applicator to selectively control the extent of contact of the roller with the applicator, and means for adjusting the roller relatively to the applicator.

11. A device for applying adhesive to selective portions of work pieces including means for advancing the work pieces through a fixed path, an adhesive applicator, means rotatably supporting the applicator for rotary contact with

the work pieces, an adhesive distributing roller, means for supporting the adhesive distributing roller in contacting relation with the applicator, means operating in timed relation with the applicator to control extent of contact of the distributing roller for applying adhesive to selective portions of the applicator, and means for driving the distributing roller while in contact with the applicator.

12. A device for applying adhesive to envelope blanks having window openings to be covered by a patch including means for moving the blanks through a fixed path, an adhesive applicator, means supporting the applicator for contacting the blanks, means contacting the applicator for distributing adhesive thereon, means operable in synchronism with the applicator for controlling the extent of contact of the distributing means with the applicator to that corresponding to the size and shape of the patch, and a platen cooperating with the applicator to support edges of the blanks around the openings therein while the adhesive is applied.

13. A device for applying adhesive to selective portions of work pieces including a support, means for advancing the work pieces through a fixed path of travel on the support, an adhesive applicator carried by the support for contacting the work pieces to apply adhesive thereto, an adhesive carrying pan carried by the support above the applicator, an adhesive pick-up roller mounted on the pan, a transfer roller contacting the pick-up roller, a distributing roller, means for supporting the distributing roller for movement to and from contact with the transfer roller and the applicator, a cam operable in synchronism with the applicator for operating the distributing roller and controlling extent of engagement of the distributing roller with the applicator, means carried by the support for changing the direction of rotation of the distributing roller during its movement to and from contact with the transfer roller and the applicator, and means for driving the distributing roller while in contact with the transfer roller and the applicator.

14. A device for applying adhesive to work pieces of the character described including means for moving the work pieces through a definite path, an adhesive applicator, means supporting the applicator for contact with the work pieces, means intermittently contacting the applicator for distributing adhesive thereto, and means controlling said distributing means to apply the adhesive to a selective portion of the applicator and means for actuating said work piece moving means in timed relation with the applicator to bring a selected portion of the respective work pieces into contact with the selected portion of the applicator.

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