Dec. 12, 1933. R. A. NELSON 1,939,359

DEVICE FOR APPLYING ADHESIVE TO ENVELOPE BLANKS OR THE LIKE

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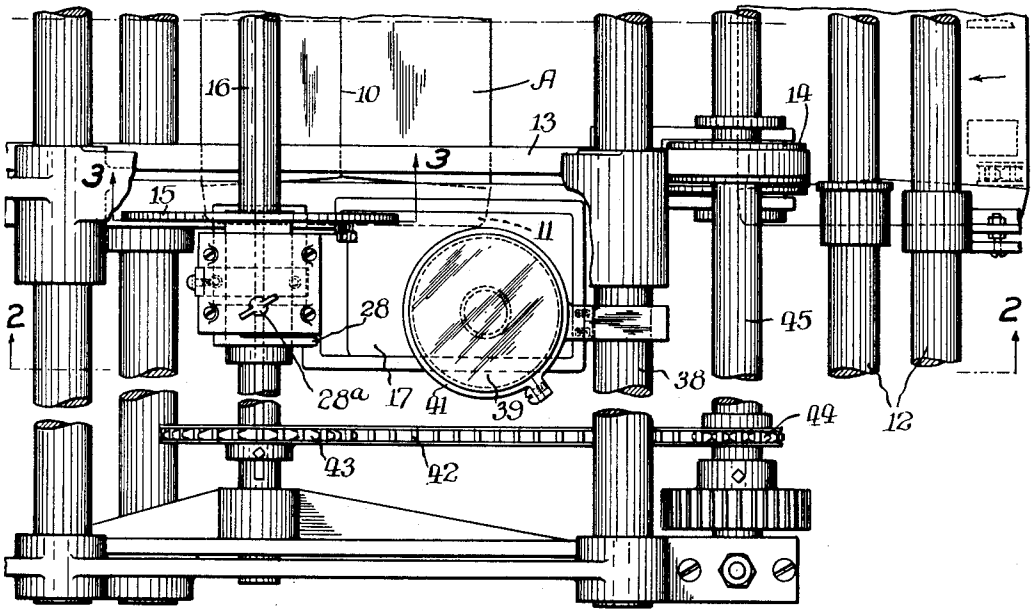


FIG. 1.

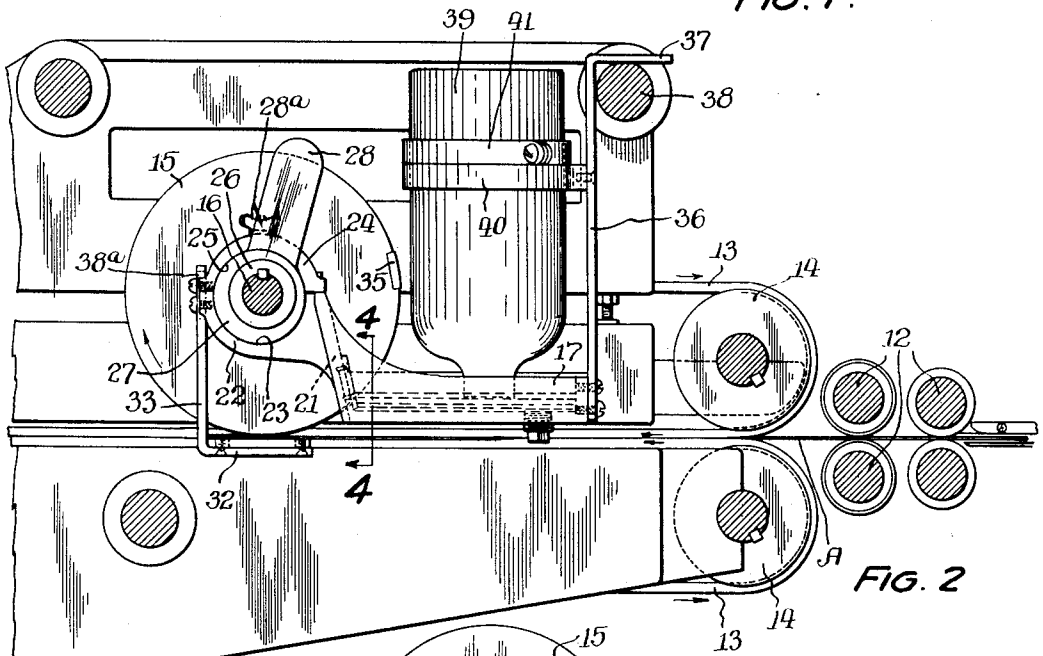


FIG. 2

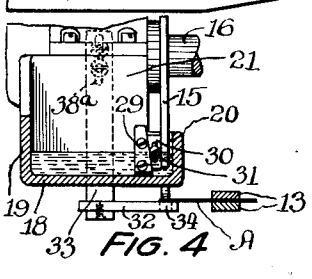


FIG. 4

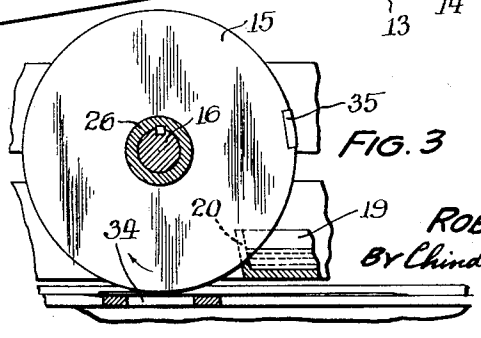


FIG. 3

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DEVICE FOR APPLYING ADHESIVE TO ENVELOPE BLANKS OR THE LIKE

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6 Claims. (Cl. 93—68)

The invention refers to a device for applying adhesive to certain portions of an envelope blank or the like and has, as its general aim, the provision of a new and improved device of this character which is simple in sonstruction, is capable of being easily and quickly adjusted, and which may, if desired, be provided as an attachment for existing machines. In prior devices of this nature, it has been customary to apply adhesive to envelope blanks by means of a train of rolls arranged to run in contact with another and to transfer, by such contact, adhesive from a supply reservoir to the blank.

An object of the present invention is to provide a novel means for applying adhesive, which embodies a single adhesive applying member arranged to transfer adhesive directly from a supply reservoir to the envelope blank.

More specifically stated, an object resides in the provision, in an envelope forming machine through which an envelope blank is conveyed, of an adhesive supply reservoir having a slot therein and a rotating disk-shaped applicator mounted with the periphery thereof extending through said slot and also disposed to engage an envelope blank being conveyed, means being provided for adjusting the relationship of the disk to the margins of said slot whereby to control the amount of adhesive carried from the reservoir by the disk-shaped applicator.

In conjunction with the foregoing, another object is to provide means for intermittently interrupting the application of adhesive in order to synchronize the operation of the applying device with the spacing of the envelope blanks.

Another object of the invention is to provide a new and improved reservoir for supplying adhesive, which reservoir embodies means for maintaining the adhesive in the reservoir at a predetermined level.

Other objects and advantages will become apparent in the following description and from the accompanying drawing, in which:

Figure 1 is a fragmentary plan view of a portion of an envelope forming machine illustrating an adhesive applying device embodying the features of the invention.

Fig. 2 is a vertical longitudinal section of the machine taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical section taken along the line 3—3 of Fig. 1.

Fig. 4 is a fragmentary transverse section taken along the line 4—4 of Fig. 2 and illustrating the relationship of the applicator and adhesive reservoir.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions faling within the spirit and scope of the invention as expressed in the appended claims.

In describing the present invention, I have chosen merely for illustrative purposes to show the invention as being in operative association with a well-known type of envelope folding machine, only parts of which appear in the drawing. One type of envelope, which may be formed by this machine, is designated A (Fig. 1) and is one in which a central longitudinally extending seam 10 is first formed by folding and securing side flaps together in overlapping relation, and subsequently folding and securing an end flap 11 in overlapping relation to the side flaps.

The operative parts of the envelope forming machine, with which the present invention is associated, comprises generally (see Figs. 1 and 2) feed rolls 12 which deliver a succession of properly spaced envelope blanks A from certain operative mechanisms (not shown) into a conveyer which is arranged to carry the envelope blank past the gumming mechanism. Only one part of the conveyer is shown herein, and this part comprises a pair of endless belts 13 arranged to travel about a pair of vertically alined sheaves 14 so positioned that adjacent runs of the belt are opposed and are in abutment. The blanks are fed between the abutting portions of the belts 13 by the rolls 12 and the arrangement is such (see Fig. 1) that the end flap 11 of the blank projects laterally beyond the belts 13.

The means for applying adhesive to the end flap 11 so that said flap may ultimately be secured in overlapping relation to the previously folded and secured side flaps, comprises, in the preferred form thereof, a disk 15 which is mounted for rotation with a shaft 16 disposed, in the machine, to extend transversely of the direction of travel of the conveyer belts 13 above said belts. The thickness of the disk 15 is equal to the width of the adhesive strip to be applied and its position on the shaft 16 is such that the disk will engage or "run" in contact with a marginal portion of the end flap of an envelope blank moving with the conveyer belts 13.

At the side of the disk, toward which the envelope blanks move, is a reservoir 17 for containing a supply of adhesive. As herein shown, the reservoir is in the form of an elongated, rectangular shaped, open-topped container having bottom and side walls 18 and 19, respectively. The side wall of the reservoir adjacent the disk has a vertically extending slot 20 (Figs. 3 and 4) therein through which a peripheral portion of the disk 15 may extend in order to become coated with the adhesive which it subsequently

transfers and applies to the end flap of the blank.

Means is provided for mounting the reservoir 17 in adjustable association with the disk 15, whereby the extent of projection of the disk into the slot 20 may be definitely and accurately adjusted and then maintained in such adjustment. This adjustment is for the purpose of determining the proper clearance between the peripheral face of the disk and the bottom of the slot whereby only a required amount of adhesive will be carried from the reservoir and delivered to the blank by the disk. To this end, a portion of the side wall 19, in which the slot 20 is located, extends upwardly as at 21 (Figs. 2 and 4), which extending portion carries a lateral flange 22 having an upwardly opening semi-cylindrical recess 23 therein.

An arcuate member 24, which presents a semi-cylindrical recess 25 formed as the complement of the recess 23, is arranged to be secured to the flange 22 and to the projecting portion 21 of the side wall to provide, with the flange 22, a cylindrically shaped collar adapted to encircle the shaft 16. The disk 15 is mounted on the shaft 16 by means of an axially extending hub 26 which is keyed to the shaft 16 and lies within the annular collar on the reservoir. A sleeve 27, having an eccentrically disposed bore therein, is interposed between the collar on the reservoir and the hub 26 on the disk.

From the foregoing, it will be apparent that, when the parts are assembled with a peripheral portion of the disk extending into the reservoir through the slot 20, a slight rotative movement imparted to the eccentric sleeve 27 will effect a relative movement of the disk and reservoir toward and away from each other. Or, in other words, the reservoir is radially pulled toward or pushed away from the peripheral face of the disk. This movement adjusts the clearance between the peripheral face of the disk 15 and the bottom of the slot 20. A hand lever 28, secured to the eccentric sleeve 27, facilitates adjusting movement of the sleeve and a quickly releasable means, such as a set screw 28^a, or the like, is preferably employed to secure the collar and sleeve rigidly together and thus maintain the parts positively in any position of adjustment.

The width of the slot 20 is preferably somewhat greater than the thickness of the disk 15, to permit disks of different thicknesses to be replaceably employed, and means are provided for adjusting the width of the slot to the exact width of the disk in order that adhesive in the reservoir will not be carried therefrom upon the sides of the disk. With reference to Fig. 4, 29 indicates a small plate which is secured to the side of the reservoir and extends along and adjacent one side of the slot. The plate 29 has one side thereof disposed at an angle to the sides of the slot. Interposed between the plate 29 and the adjacent side of the disk 15 is a second plate 30 having one flat side arranged to abut the side of the disk and having an opposed angular side arranged to abut and complement the angularly disposed side of the plate 29. The plate 30 is mounted on the side wall for vertical sliding adjustment in any suitable manner, as by means of a screw and elongated slot connection 31. In assembling or adjusting the parts, the disk is mounted on the shaft 16 in such manner that one side of the disk 15 abuts and rotates in snug wiping contact with one side of the slot 20. The plate 30 is then adjusted snugly to abut the opposite side of the disk 15. Consequently, during operation, the sides of the disk will be wiped substantially clean of adhesive.

Means are provided for guiding and holding the end flap 11 of the envelope in positive contact with the adhesive carrying peripheral face of the disk 15 in order to insure perfect application of adhesive to the flap. One form of such means is shown in Figs. 2, 3 and 4 and comprises a flat plate 32 positioned in underlying relation to the disk 15. Preferably, the plate 32 is supported by means of an arm 33 depending from the flange 22 on the reservoir. An elongated slot and screw connection 38^a preferably connects the parts thereby allowing adjustment of the plate 32 toward and away from the adjacent portion of the disk. The plate 32, when adjusted, is spaced from said adjacent portion substantially the thickness of the material from which the envelope blank is formed. Preferably, the plate has an elongated recess or aperture 34 (Figs. 3 and 4) therein, which is opposed to the disk. This recess or aperture prevents adhesive from being transferred to the guide plate 32 during the interval between successive blanks.

It is contemplated that on occasions it may be desirable to interrupt the application of adhesive to certain portions of the blank by the disk. Such an occasion arises, for example, when, in order to avoid undesirable spreading or "smearing" of the adhesive, it becomes advantageous to leave short portions of the blank adjacent the leading and trailing edges of the blank uncoated. In this event, an insert member such as a plug 35 or the like, of suitable length is mounted in an appropriate recess formed in the margin of the disk. The plug projects beyond the periphery of the disk a distance which should be almost exactly equal to the depth of the clearance between the periphery of the disk and the bottom of the slot 20. Consequently, when the insert 35 passes through the slot, the slot will be entirely closed and no adhesive will be carried from the reservoir upon the insert 35.

When an insert is employed, the disk has a circumferential length which is substantially equal to the width of the blank and the disk is driven in such synchronism with the feeding of the blanks that the leading edge of the blank engages the disk at approximately the middle of the insert. Hence, at the leading edge, no adhesive is applied to the blank for a space equal to one-half the length of the insert. As the blank subsequently passes the disk, adhesive is applied thereto until the insert again comes into engagement with the blank, this time at the trailing edge thereof to leave a second ungummed space on the blank. Obviously, the distance or space between adjacent blanks must be predetermined so that each blank is properly engaged by the insert. It may be mentioned in passing that the disk may be replaced by another of different diameter when the machine is readjusted to operate upon a blank of a different size.

The end of the reservoir opposite the shaft-encircling collar may be supported in place, in any suitable manner, which permits the reservoir to be freely adjusted relative to the disk. Thus, a bar 36 is secured to the side wall of the reservoir to extend upwardly therefrom and the bar has a laterally turned portion 37 at its upper end arranged to overlie and rest upon a transverse supporting rod 38 rigid with the machine.

Means are preferably provided for constantly maintaining the level of the adhesive in the

reservoir at a predetermined point. One form of such means comprises a bottle 39 or similar receptacle arranged to be held in inverted relationship to the reservoir by means of a stationary bottle-receiving collar 40 carried by the bar 36 and a second collar 41 encircling the bottle 39 and adjustable longitudinally thereof. The collar 41 is, in practice, secured on the bottle 39 in such position that, when the collars 40 and 41 are abutting, the mouth of the bottle is located within the reservoir at approximately the desired level of adhesive. When adhesive is withdrawn from the reservoir below the mouth of the bottle, additional adhesive will flow from the bottle until the desired level is reestablished. It will be obvious that the level may be easily relocated at any desired point and that the bottle may be readily withdrawn from the supporting collar 40 in order to replenish the reserve supply of adhesive.

The shaft 16 may be driven from any suitable source of power, as for example, by means of an endless chain 42 (Fig. 1) which passes about a sprocket 43 on the shaft 16 and about a drive sprocket 44 rigid with a shaft 45 by which the upper one of the conveyer sheaves 14 is driven.

The device, of course, must first be adjusted for operation upon a blank of a particular size. Thus, a disk of proper width and circumference is mounted on the shaft 16 and is so positioned with respect to the conveyer belts 13 as to properly apply a strip of adhesive to a blank being conveyed thereby. The wiping contact of the side of the disk and one side of the reservoir slot is established, after which the plate 30 is adjusted to the opposite side of the disk. Movement of the hand lever 28 rotates the eccentric sleeve 27 to produce a proper clearance between the periphery of the disk and the bottom of the slot 20 so that the correct amount of adhesive will be withdrawn from the reservoir upon the periphery of the disk. The movement of the blanks into engagement with the disk is synchronized with the rotation of the disk and the device is ready for operation.

In operation, as each blank engages the disk, a strip of adhesive is applied along the bottom edge of the end flap which strip may be continuous from one side to the other. However, when an insert member 35 is used, the applied adhesive strip will stop short of both side edges. After the adhesive has been applied, the blank is delivered to subsequently operated mechanisms which fold the end flap over onto the side flaps and press the flap thereagainst to complete the envelope. When one or more blanks in the succession are missing, the slot in the guide plate 32 allows the disk to rotate freely without depositing adhesive.

It will be apparent from the foregoing that a novel device has been provided for the purpose set forth which is simple, may be easily and very accurately adjusted. The device may also be quickly adapted for operation on envelope blanks of different sizes. That is to say, by merely withdrawing one end of the shaft 16 from its bearing, the disk 15 may be replaced by another of different size. This simple arrangement, when coupled with the compact structure by which the reservoir is supported and adjusted, further permits the entire assembly to be incorporated in or removed from an existing machine as a unitary attachment.

A further and important advantage resides in the use of the single adhesive conveying and applying disk which eliminates the many close adjustments necessary in prior gumming devices employing a train of transfer rolls. Moreover, wear of the parts, which is a disadvantage inherent in a train of rolls, is practically prevented.

I claim as my invention:

1. In a device of the character described, the combination of an adhesive container having a slotted side, a rotatable disk extending in part through said slot and arranged to carry adhesive from the container for application to a blank, said disk having one side face in wiping contact with one side of said slot, means on said container adjustable into wiping engagement with the other side of said disk, and means for adjustably moving said container toward and away from the peripheral face of said disk.

2. In an envelope forming machine having means for conveying a blank through the machine, the combination of a rotating member adapted to engage a blank, an adhesive supply reservoir having a slot therein through which said member extend, and an insert in said member arranged to engage the sides of said slot as said insert passes therethrough to prevent adhesive from being transferred upon said insert.

3. In combination with an envelope forming machine having an axially movable shaft, a unitary adhesive applying device comprising an applicator disk having a hub adapted to slide over one end of the shaft, and an adhesive supply reservoir supported by said hub.

4. An adhesive applying device for an envelope forming machine or the like comprising, in combination, a container for adhesive having an aperture in one side thereof, a disk journalled for rotation with a peripheral portion thereof extending through said aperture into contact with the adhesive, and means carried by the disk for wiping engagement with the margin of said aperture to interrupt the transfer of adhesive to the disk.

5. An adhesive applying device for an envelope forming machine or the like comprising, in combination, a container for adhesive having a slot in one side thereof, a rotatable disk extending in part through said slot and having a peripheral portion positioned to engage a blank, stationary means having a wiping contact with the opposite side faces of the disk to prevent adhesive from being carried from the container thereon, whereby adhesive may be carried from the reservoir only upon the periphery of the disk, and means carried by the disk and extending peripherally therefrom to closely fit said slot in its passage therethrough.

6. In an envelope forming machine having mean for conveying a blank through the machine, the combination of a rotating member adapted to engage a blank, an adhesive supply reservoir having a slot therein through which said member extends, and an insert in said member arranged to engage the sides of said slot as said insert passes therethrough to prevent adhesive from being transferred upon said insert, said insert having a peripheral dimension at least as great as the distance between adjacent blanks to be treated.

ROBERT A. NELSON.