

July 9, 1968

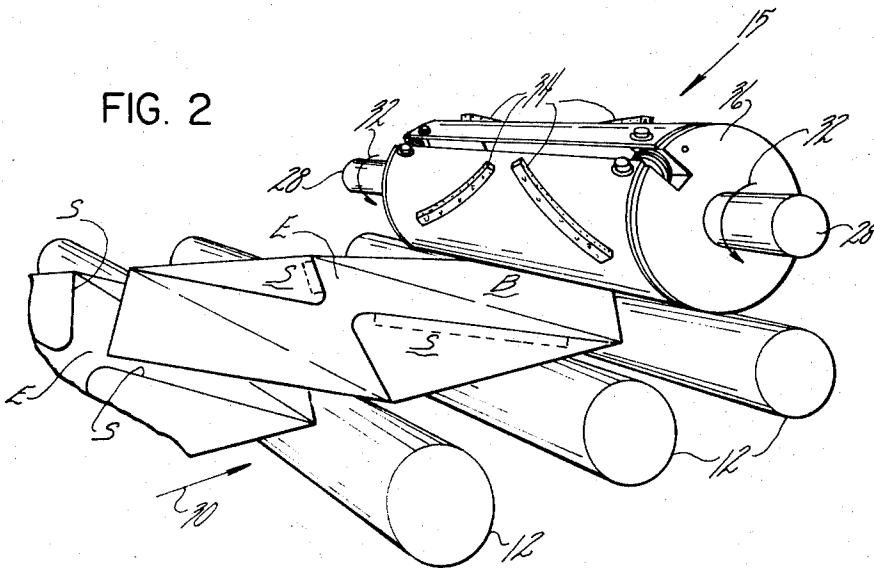
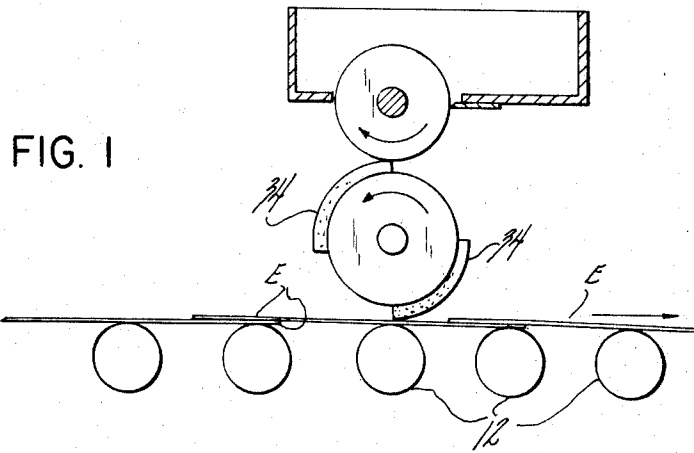
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3,391,673

ROTARY ADHESIVE APPLYING DEVICE FOR ENVELOPE FORMING MACHINE

Filed June 30, 1967

3 Sheets-Sheet 1



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FIG. 3

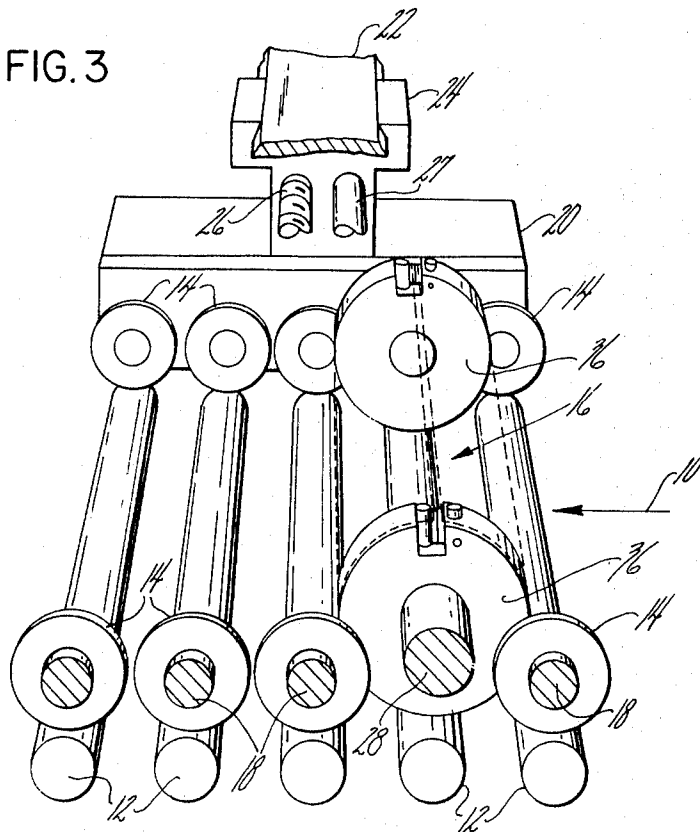
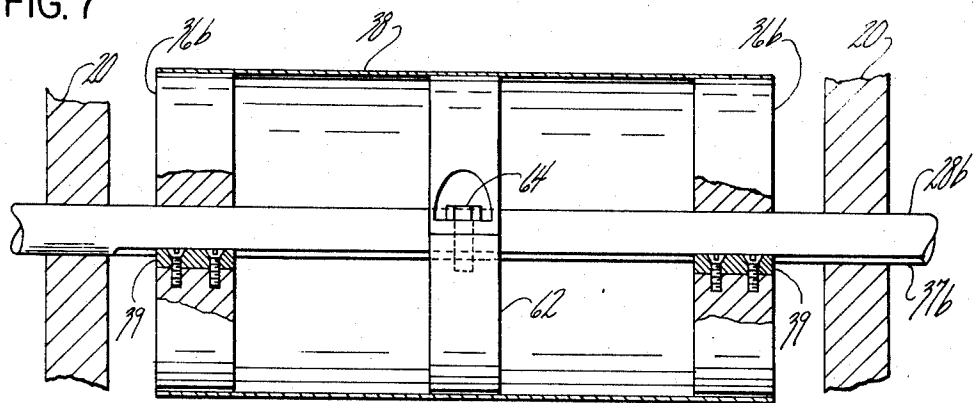


FIG. 7



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FIG. 4

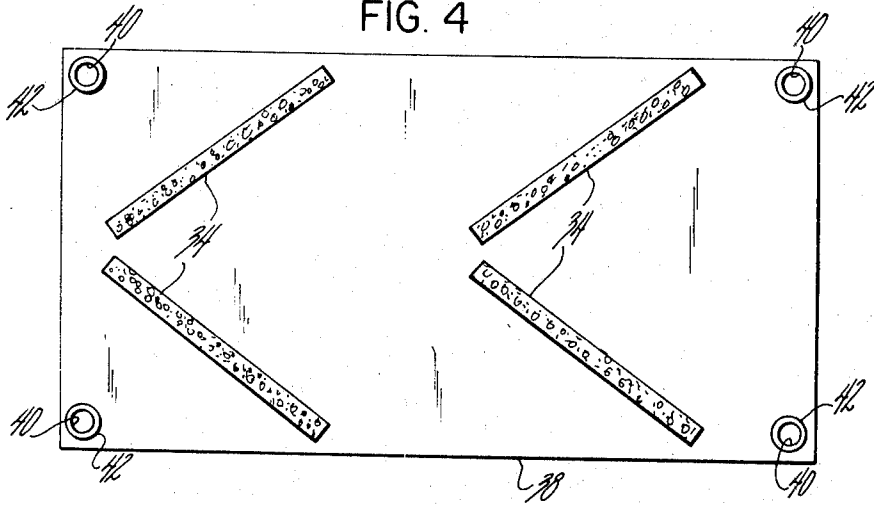


FIG. 5

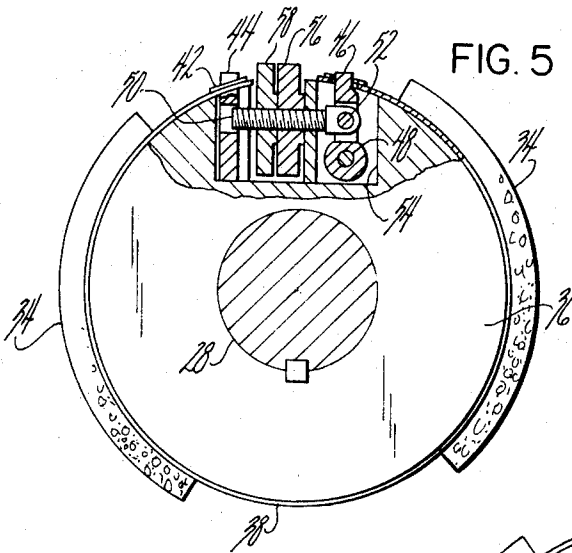
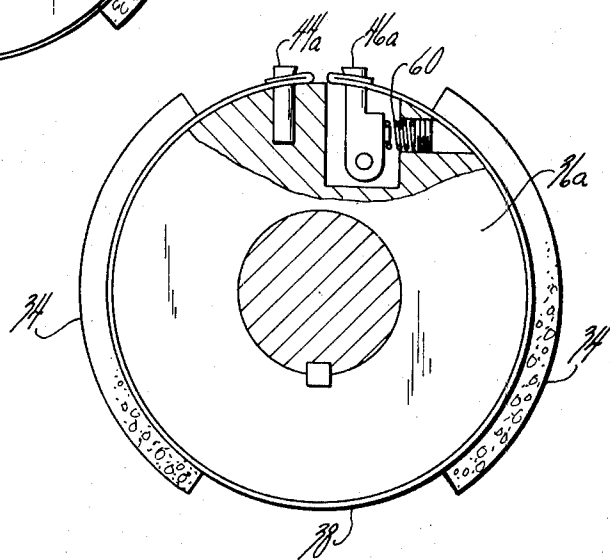


FIG. 6



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**ROTARY ADHESIVE APPLYING DEVICE FOR ENVELOPE FORMING MACHINE**

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10 Claims. (Cl. 118—212)

**ABSTRACT OF THE DISCLOSURE**

A rotary glue applying roll for use in a machine for folding and gluing envelope blanks of various size. The machine has split feed rolls which are adjustable toward and away from one another to accommodate the different size blanks, and the roll itself has end plates which are mounted either on separate stub shafts or slidably mounted on a single shaft so that said end plates can be moved axially toward and away from one another. Depending upon the breadth of the envelope blanks to be glued, a resilient sheet member of appropriate length is wrapped around the end plates and releasably secured to the respective circumferences thereof by a plurality of studs, some of which can be pivoted to tension the sheet member and lock it in position.

*Background of the invention*

Present day envelope machines are capable of relatively high rates of envelope production, but as a side effect of the design features required to obtain speed, there has been a tendency to accept complexity, and with it the extensive downtimes required to convert the machine from one type, or size, of envelope blank to another.

For example, it has been customary to remove and replace the adhesive applying members for gluing up the two in-folded side flaps whenever a machine is converted from one production run of a particular envelope type and size to another.

*Summary of invention*

This invention relates generally to machines for folding and gluing envelope blanks, and deals more particularly with a rotary adhesive applying device especially well suited for use in a machine capable of handling blanks of various sizes.

A general object of the present invention is to provide a rotary adhesive applying device which comprises a roll having an axial length which can be readily varied so that the adhesive applying portion thereof can accommodate envelopes of various size.

A more specific object of the present invention is to provide a rotary adhesive applying device including a roll having adjustable end portions, and a quickly detachable cylindrical portion therebetween which can be removed and replaced to glue selective portions of envelope blanks of various sizes and shapes.

The drawings show preferred embodiments of the invention and such embodiments will be described, but it will be understood that various changes may be made from the constructions disclosed, and that the drawings and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

*Brief description of the drawings*

FIG. 1 is a side elevational view, in schematic form, illustrating a rotary device of the present invention in an envelope forming machine of the foregoing character.

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FIG. 2 is a perspective view of a portion of the apparatus depicted in FIG. 1.

FIG. 3 is a perspective view of a portion of the rotary adhesive applying device illustrating the split feed rolls for advancing envelope blanks past a device of the present invention, and also shows the mechanism for pre-positioning the split feed rolls, and the end plates associated with the rotary device of FIG. 2.

FIG. 4 is a plan view of the adhesive applying cylindrical portion of the device shown in FIG. 2 in its flattened configuration.

FIG. 5 is an elevational view with a portion of one end plate broken away to reveal a preferred means for releasably securing the adhesive applying portion of FIG. 4 to the circumference of one of its associated end portions.

FIG. 6 is a view similar to FIG. 5 but shows an alternative construction for the means for releasably securing the adhesive applying portion to one end portion thereof.

FIG. 7 is a sectional view of an alternative construction for the rotary adhesive applying device of the present invention.

*Detailed description*

Referring now to the drawings in greater detail, FIG. 3 shows a portion of a machine for forming envelopes of various size. Envelope blanks are fed longitudinally in the direction of the arrow 10 along a generally flat conveyor which may comprise a plurality of cylindrical rolls 12, 12 rotatably supported in the fixed frame of the machine. A plurality of split feed rolls 14, 14 have corresponding portions at either side of the path of movement of the envelope blanks for engaging said blanks adjacent their end portions and feeding the blanks in the direction of the arrow 10. Preferably, these blanks are indexed with respect to one another prior to being fed between the rotary glue applying device, indicated generally at 16 to be described in greater detail hereinbelow, and the cylindrical rolls 12, 12. Each of the split segmented feed rolls 12, 12 is carried on a stub shaft 18 so that the rolls are movable toward and away from one another as a result of movement of the housings 20, 20 (one shown) in directions perpendicular to the path of movement 10 of the envelope blanks.

While any suitable means might be adapted for slidably supporting the housing 20, preferably, and as shown, a fixed way 22 extends transversely across the path of movement of the envelope blanks 10 for slidably receiving a T-shaped support 24 connected at its lower end to the housing 20 and adapted to be slidably received on the way 22. A lead screw 26 is driven by crank means (not shown) so that the rolls 14, 14 can be prepositioned for producing envelopes of a particular size. The lead screw 26 preferably includes a left-hand threaded end portion and a right-hand threaded portion for moving the housings 20, 20 toward and away from one another, and in unison with one another. The housing at the near side of the machine, as viewed in FIG. 3, has been omitted for clarity.

An input drive shaft 27 located alongside the leadscrew 26 is connected through suitable gearing (not shown) in the housings 20, 20 to the split feed rolls 14, 14 and to the rotary device 16 to be described.

FIG. 2 shows the conveyor rolls 12, 12 along which the envelope blanks E, E are fed by the split feed rolls 14, 14 in the direction of the arrow 30. The side flaps S, S have been previously folded along a line parallel to the direction of movement of the blanks. The bottom flaps B, B have been scored, as indicated by the transversely extending score lines associated therewith.

Turning now to a detailed description of the rotary adhesive applying device 16 of the present invention, stub

shafts 28, 28 associated with either end of the device are continuously driven in the direction of the arrows 32, 32 by the input drive shaft 27. Glue applicator pads 34, 34 on the device 16 register with the leading edges of the infolded side flaps S, S to apply a film of glue thereto so that the bottom flaps B, B can be subsequently folded rearwardly into sealing engagement with the side flaps S, S to form the completed envelope.

The stub shafts 28, 28 can be moved toward and away from one another by movement of their associated housings 20, 20 so that envelope blanks of various size can be glued up in a machine embodying the present invention. Each stub shaft 28 has associated therewith an end plate or disc 36 which is keyed to the shaft 28, as best shown in FIG. 5. An initially flat sheet member 38, of resilient material is wrapped around the circumferences of the respective end plates 36, 36 and releasably secured thereto by suitable means to be described. The resilient sheet member 38 may comprise a relatively thin sheet of brass or the like to which the applicator pads 34, 34 are applied so as to register with the leading edge portions of the side flaps of the particular envelope blank to be glued, or may comprise a suitable thermoplastic material depending upon the particular installation.

As shown in FIG. 4, the sheet member 38 is preferably rectangular in planform when laid flat, and has openings adjacent its four vertices for receiving studs provided for this purpose in the end plates 36, 36. The openings 40, 40 may be reinforced with a suitable grommet 42 as shown in FIGS. 4 and 5.

Referring now to FIG. 5 in greater detail, each end plate 36 comprises a circular disc having a first, or fixed generally radially outwardly extending stud 44 for receiving one of the openings 40 in the sheet member 38. A second stud 46 is pivotally mounted adjacent the first stud for limited movement about a pivot pin 48, which is arranged generally parallel to the axis of rotation of the device itself. The second stud 46 also extends generally radially outwardly with respect to the circular disc or end plate 36 so as to be received in another opening 40 defined for this purpose in the opposite end of the sheet member 38. Means is provided for adjustably positioning the second stud 46 with respect to the first stud 44 in the end plate for tensioning the resilient sheet member and securing said member to each of the end plates 36, 36.

As shown in FIG. 5, said last-mentioned means comprises a threaded post 50 connected at one end to said second stud 46 through the pivot pin 52 so that said threaded post extends generally perpendicularly with respect to the second stud across a notch 54 provided for this purpose in the end plate 36. At least one knurled nut 56 is threadably received on the post 50 for engaging a generally radially extending side wall of the notch 54 to allow the position of the second stud 46 to be adjusted with respect to the first stud 44 upon rotation of the nut 56. A lock nut 58 is also provided to prevent loosening of the nut 56 during operation of the machine.

Turning now to FIG. 6, an alternative construction for the means for adjustably positioning said second stud with respect to its associated first stud in the end plate is there depicted. In this embodiment the first stud 44a is fixed in the end plate and includes a radially outwardly extending portion for receiving an opening 40 in the sheet metal member 38 as shown. The second stud 46a is pivotally mounted in a notch provided for this purpose in the end plate 36a and means is provided for urging the second stud toward its associated first stud in order to tension the sheet member 38 around its associated end plates 36a, 36a.

Referring now to the alternative construction shown in FIG. 7, the rotary adhesive applying device comprises a single shaft 28b, having its opposite ends rotatably received in the housings 20, 20. The driven end, or ends, of the shaft 28b (not shown) may be splined in order to per-

mit sliding movement of the housings 20, 20 with respect thereto.

The end plates 36b, 36b are similar in construction to those described hereinabove with reference to the foregoing embodiment, however keys 39, 39 are carried on the end plates by the screws as shown, to permit axial sliding movement thereof in a keyway 37b defined by the shaft 28b. As so constructed, a resilient sheet member 38 can be attached to these end plates 36b, 36b for gluing up envelopes of various breadths.

Still with reference to FIG. 7, a support disc 62 is preferably provided intermediate the end plates 36b, 36b when the envelope to be glued is quite large in breadth, or when the member 38 requires additional support for any reason, as for example when said member is made from a thermoplastic material, or a rubberized cloth. The disc 62 is made in two halves and a screw 64 serves to releasably clamp these halves to the shaft 28b. However, the disc is not otherwise attached to the sheet member 38, so that the latter can be easily removed or replaced with minimum downtime to the overall machine.

By way of summary then, the rotary adhesive applying device described herein can be adapted for gluing up envelope blanks of any particular size merely by removing and replacing the sheet member 38 upon which the pads 34, 34 are arranged. As shown in FIG. 1 a glue reservoir may be arranged above the device 15, and a glue pick-up roll mounted therein to provide a continuous source of glue for the pads 34, 34.

It should also be noted that the number, and orientation of the pads 34, 34 on the sheet member 38 will depend on the requirements of the particular installation, and while two sets of pads are shown in FIG. 4 the invention is not so limited. For example, one or more pair of pads might be used depending on the diameter of the device itself, a larger diameter permitting a larger number of pad sets.

We claim:

1. A rotary adhesive applying device comprising axially spaced circular end plates, a resilient sheet member wrapped around said circular end plates to provide a generally cylindrical roller having an axial length dictated by the breadth of said sheet member, means for removably securing opposite marginal edge portions of said sheet member to the respective circumferences of said circular end plates, and adhesive applying pads carried by said sheet member for depositing adhesive on selected portions of an article conveyed tangentially past said rotary device.

2. An adhesive applying device as set forth in claim 1 and further characterized in that said means for removably securing said sheet member to said end plates comprises two radially outwardly extending studs in each end plate circumferences, said studs being receivable in openings in the marginal edge portions of said sheet member.

3. An adhesive applying device as set forth in claim 1 and further characterized in that said means for removably securing said sheet member to said end plates comprises an outwardly extending first stud in the circumference of each end plate, said studs being receivable in openings in the marginal edge portions of said sheet member, a second stud associated with each of said end plates and also receivable in corresponding openings in said sheet member, and means for adjustably positioning said second studs with respect to said first studs in said end plates for tensioning said sheet member and securing said member to said plates.

4. An adhesive applying device as set forth in claim 1 and further characterized in that said means for removably securing said sheet member to said end plates comprises an outwardly extending first stud in the circumference of each end plate, said studs being receivable in openings in the marginal edge portions of said sheet member, a second stud movably mounted adjacent said first stud in each of said end plates and also receivable in

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corresponding openings in said sheet member, and means for urging said second studs toward said first studs respectively to tension said sheet metal member around said end plates.

5. An adhesive applying device as set forth in claim 3 and further characterized in that said means for adjustably positioning said second studs in said end plates comprises threaded posts each of which is connected to said second stud and extends perpendicularly with respect to said second stud into a notch provided for this purpose in said end plate, and at least one knurled nut threadably received on each of said posts for engaging a generally radially extending side wall of said notch to allow adjusting the position of said second stud with respect to said first stud by rotating said nut.

6. An adhesive applying device as set forth in claim 4 and further characterized by means for pivotally mounting each of said second studs in its associated end plate for limited movement about an axis parallel to the axis of rotation of said device.

7. An adhesive applying device as set forth in claim 6 and further characterized in that said means for urging said second studs toward said first studs respectively comprises threaded posts each of which is connected at one end to one of said pivotally mounted second studs and extends perpendicularly with respect thereto with its opposite end extending into a notch provided for this purpose in said end plate, and at least one knurled nut threadably received on each of said posts for engaging a generally radially extending side wall of said notch to allow adjusting the angular position of said second stud with respect to said first stud by rotating said nut.

8. An adhesive applying device as set forth in claim 6 and further characterized in that said means for urging said second studs toward said first studs respectively comprises spring biasing means acting between each of said end plates and said second studs to pivot the outer end of said second studs toward their associated first studs.

9. In an envelope making machine wherein envelope blanks are fed longitudinally therethrough for folding and

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gluing, and wherein split feed rolls are adjustably mounted so as to be prepositionable toward and away from the path of movement of said blanks to receive blanks of various size, the improvement comprising a rotary adhesive applying device including axially spaced circular end plates, at least one shaft associated with said end plates, housing means for said shaft for moving said end plates toward and away from one another in unison with the prepositioning of said split feed rolls, a resilient sheet member wrapped around said circular end plates to provide a generally cylindrical roller having an axial length dictated by the breadth of the envelope blank to be glued up, means for removably securing opposite marginal edge portions of said sheet member to the respective circumferences of said circular end plates, and adhesive applying pads carried by said sheet member for depositing adhesive on selected portions of said envelope blanks.

10. The combination as set forth in claim 9 and further characterized in that said means for removably securing said sheet member to said end plates comprises an outwardly extending first stud in the circumference of each end plate, said studs being receivable in openings in the marginal edge portions of said sheet member, a second stud movably mounted adjacent said first stud in each of said end plates and also receivable in corresponding openings in said sheet member, and means for urging said second studs toward said first studs respectively to tension said sheet member around said end plates.

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