

[54] **RETRACTABLE GUMMER DIE FOR ENVELOPE MACHINES**

[75] Inventors: **Herbert W. Helm**, Hollidaysburg; **Henry D. Barthalow**, East Freedom, both of Pa.

[73] Assignee: **F. L. Smithe Machine Company, Inc.**, Duncansville, Pa.

[22] Filed: **Sept. 3, 1970**

[21] Appl. No.: **69,338**

[52] U.S. Cl. .... **118/212, 118/258**

[51] Int. Cl. .... **B05c 1/02**

[58] Field of Search ..... **101/40, 38 R; 118/205, 212, 118/258, 243, 263; 29/124**

[56] **References Cited**

**UNITED STATES PATENTS**

3,250,213	5/1966	Brigham et al. ....	101/40
3,200,742	8/1965	Kasermann .....	101/38 R X
2,231,574	2/1941	Emerick .....	118/212
2,490,902	12/1949	Goodwin .....	118/212 UX
3,521,554	7/1970	Zurick .....	101/40
3,261,281	7/1966	Hartmeister .....	101/40 X

Primary Examiner—John P. McIntosh  
Attorney—Stanley J. Price, Jr.

[57] **ABSTRACT**

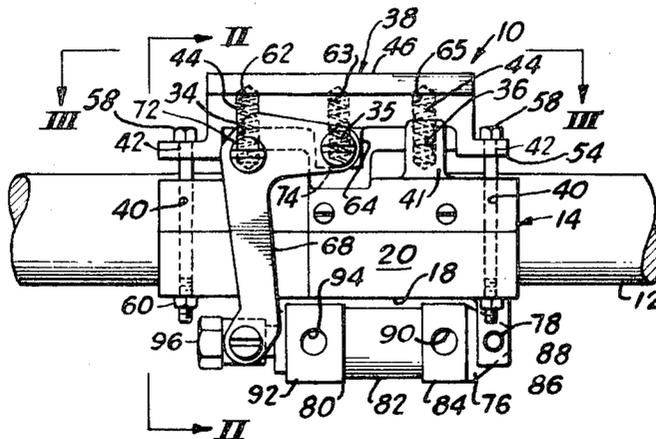
Apparatus for applying adhesive to an envelope blank includes a rotatably mounted shaft with an adhesive

applicator assembly secured thereto. The applicator assembly has a body portion of generally rectangular configuration with a bottom wall, pairs of side walls and a top wall. An air actuated piston cylinder assembly is mounted on the bottom wall of the body portion substantially parallel to the axis of the rotatable shaft. A pair of L-shaped levers are pivotally secured intermediate their end portions to the side walls of the body portion and have one end portion connected to the rod portion of the piston cylinder assembly. A gummer die holder is mounted in overlying relation with the top wall of the body portion and is resiliently urged by spring members radially away from the body portion top wall. The other end of each of the levers is pivotally connected to the gummer die so that the piston cylinder assembly is arranged through the levers to retract the gummer die and move the gummer die toward the applicator assembly body top wall against the force of the spring members. Suitable control means are provided to supply air to the cylinder after a predetermined time delay to thereby retract the gummer die holder and prevent the gummer die holder from transferring adhesive to the back-up rolls.

In one embodiment, the spring members are positioned around the bolts that secure the gummer die holder to the body portion and channel-shaped guide members are provided on the gummer die holder that extends around the bolts extending upwardly from the body portion.

In another embodiment, the spring members are positioned in aligned spring receiver bores in the top wall of the applicator body portion and the bottom wall of the gummer die holder.

**8 Claims, 6 Drawing Figures**



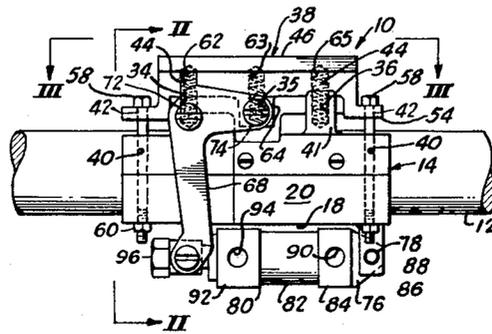


Fig. 1.

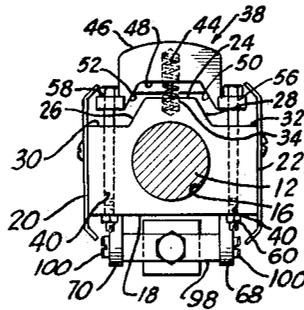


Fig. 2.

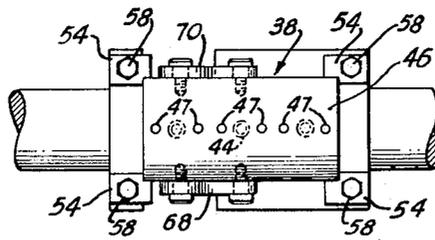


Fig. 3.

INVENTORS.  
Herbert W. Helm &  
Henry D. Bartholow.  
BY *Stanley J. ...*  
THEIR ATTORNEY

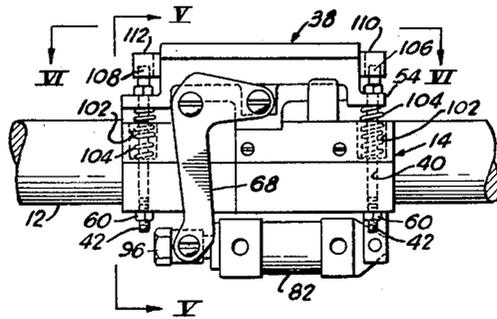


Fig. 4.

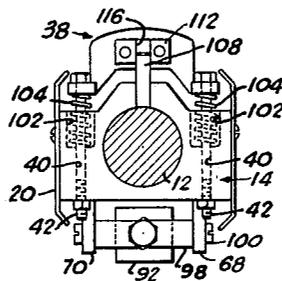


Fig. 5.

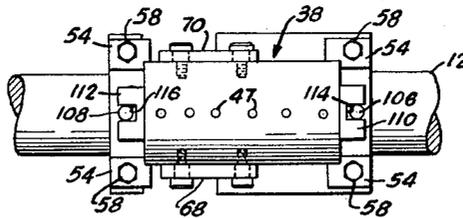


Fig. 6.

INVENTORS.  
Herbert W. Helm &  
Henry D. Bartholow.

BY Stanley J. Price  
THEIR ATTORNEY.

# RETRACTABLE GUMMER DIE FOR ENVELOPE MACHINES

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

This invention relates to adhesive applying apparatus for envelope machines and more particularly to adhesive applying apparatus having a retractable adhesive applicator die.

### 2. Description of the Prior Art

In the manufacture of envelopes, adhesive is applied to the margin of the envelope blank windows and to the folded side flaps by applicators or dies in the form of a cylinder segment that extends radially from a rotatably mounted shaft. The envelope blank is conveyed between the rotating die and a support roller in timed relation therewith so that the die or applicator is in contact with the surface of the envelope blank while the die is in the lower quadrant of each revolution. The applicator contacts an adhesive supply roll on each revolution of the shaft to coat the arcuate surface of the applicator die with a film of adhesive that is then transferred to the envelope blank as the applicator rotates into contact with the envelope blank. The envelope blank feeding mechanism cooperates with the gum applying device so that under ordinary operating conditions, a blank is positioned between the applicator die and the pressure roller at the time when the applicator is in adhesive applying position for the envelope blank. Occasionally, because of malfunctions in the envelope machine or an interruption in the supply of envelope blanks to the machine, a steady, continuous stream of envelope blanks is not available for positioning between the applicator die and the cooperating pressure roller. When this occurs, the adhesive on the arcuate surface of the applicator is transferred to the surface of the back-up roller and results in the adhesive being applied to both sides of the envelope blank. The improperly gummed envelope blank at times adheres to other components of the envelope machine and causes interruptions in the processing of envelope blanks.

Also, when the envelope machine is stopped with an envelope blank in contact with the gummer die, the envelope blank will adhere to the gummer die and must be removed by hand or a jam will result when the machine is restarted.

There have been several proposals for preventing the transfer of adhesive from the applicator die to the back-up roll or to prevent the adhering of the envelope blank to the die when the machine is stopped. U.S. Pat. No. 1,848,138 discloses apparatus for pivoting the back-up roll out of contact with the applicator segment when an envelope blank is not positioned therebetween. U.S. Pat. No. 1,961,162 directed to adhesive applying apparatus for the side flaps includes a means to pivot the rotatable shaft on which the applicator dies are supported relative to the adhesive supply roller and to the back-up roller. U.S. Pat. No. 2,191,505 discloses apparatus for immersing the back-up roll in a water bath and providing wiper devices for the back-up roll. With this arrangement, adhesive applied to the back-up roll is removed by the water bath and the film of water is removed from the back-up roll by the wiper devices.

The above patents disclose apparatus for preventing the transfer of adhesive to the back-up roll. Where the applicator and back-up roll are moved relative to each other, there is a movement of either the applicator roll shaft with the applicator secured thereto or movement of the back-up roll away from the applicator shaft. There is a need for apparatus to prevent the transfer of adhesive to the back-up roll or the adhering of envelope blanks to the die when the machine is stopped by moving the adhesive applicator relative to the back-up roll without moving the shaft supporting either the back-up roll or the shaft supporting the adhesive applicator.

## SUMMARY OF THE INVENTION

The hereinafter described invention is directed to an adhesive applicator for an envelope machine that includes a shaft rotatably mounted on the envelope machine. An adhesive applicator assembly is mounted on the rotatable shaft intermediate the shaft end portion for rotation therewith. The assembly includes a body portion that extends radially from the shaft and a gummer die holder positioned in overlying relation with the outer peripheral surface of the applicator assembly body portion. The gummer die holder is secured to the applicator body portion and is movable radially toward and away from the applicator assembly body portion. Stop means are provided to limit the radially outward movement of the gummer die holder relative to the applicator body portion and resilient means urge the gummer die in a radial direction relative to the applicator assembly body portion. Power operated means move the gummer die in the opposite radial direction against the force of the resilient means to thereby control the relative radial position of the gummer die on the shaft member.

A preferred power operated means to move the gummer die includes an air operated piston cylinder assembly secured to the under side of the body portion and connected to the gummer die holder by means of a pair of levers. The body portion has a plurality of bolt receiving passageways therethrough through which connecting bolts extend and secure the gummer die holder to the applicator assembly body portion. Spring means positioned around the bolt members or in separate recessed portions in the gummer die holder and applicator body portion urge the gummer die radially outwardly from the shaft member. Suitable guide means are provided on the applicator body portion and gummer die holder to control the radial movement of the gummer die holder relative to the applicator body portion. With this arrangement, air is supplied to the cylinder of the piston cylinder assembly to retract the gummer die holder against the urging force of the spring members. When the air pressure is removed from the cylinder, the resilient means urges the gummer die holder outwardly into operative position for applying adhesive to the envelope blanks. The gummer die holder is arranged to retract after a short time delay when the machine stops and thus prevents the envelope blanks from sticking to the die and also from transferring adhesive to the back-up roller.

Accordingly, the principal object of this invention is to provide an adhesive applicator for an envelope machine wherein the gummer die holder is radially

retracted on the support shaft when envelope blanks are not operatively positioned for the application of an adhesive thereto.

Another object of this invention is to provide an adhesive applicator for an envelope machine that moves the peripheral surface of the adhesive applicator away from the back-up roll without moving the back-up roll shaft or the applicator shaft.

These and other objects and advantages of this invention will be more completely disclosed and described in the following specification, the accompanying drawings and the appended claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary view in side elevation of one embodiment of the adhesive applicator assembly mounted on a rotatable shaft with the spring members positioned in aligned bores in the applicator body portion and the gummer die holder.

FIG. 2 is a view in end elevation taken along the lines II—II of FIG. 1 illustrating the adhesive applicator assembly in an extended position.

FIG. 3 is a fragmentary top plan view of the applicator assembly taken along the line III—III of FIG. 1.

FIG. 4 is a view similar to FIG. 1 of another embodiment in which the spring members surround the bolts connecting the gummer die holder to the applicator body portion.

FIG. 5 is a view in end elevation taken along the line V—V in FIG. 4.

FIG. 6 is a fragmentary top view taken along the line VI—VI of FIG. 4.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Adhesive applicators for envelope machines include a reservoir of liquid adhesive with an adhesive roll partially immersed therein. The adhesive roll is arranged to rotate in the liquid adhesive and have a film of liquid adhesive adhere to the outer peripheral surface. The adhesive applicator includes a shaft rotatably mounted adjacent the applicator roll. An applicator assembly usually in the form of a cylinder segment extends radially from the shaft and has an arcuate peripheral surface that is arranged to contact the adhesive roll on rotation for the transfer of a portion of the film of adhesive from the adhesive roll to the applicator. A back-up roll is rotatably positioned adjacent to the applicator shaft and is arranged to support the bottom surface of the envelope blank while the adhesive applicator arcuate peripheral surface transfers the film of adhesive to the envelope blank top surface. Suitable feed rolls and take away rolls are provided to convey the envelope blank to and away from the adhesive applicator. All of the rolls and shafts are driven in timed synchronized relation so that the envelope blanks are properly positioned to receive the adhesive in the margin area surrounding the window formed in the envelope blank.

The above described components of an envelope machine and control devices therefore are well known in the art and are illustrated and described in U.S. Pats. as, for example, U.S. Pat. Nos. 1,848,138 and 1,961,162 that are incorporated herein by reference. In order to more clearly illustrate the invention the well known components of the envelope machine as for ex-

ample the applicator roll, the back-up roll and the control elements to actuate the air actuated piston cylinder assembly, have been omitted and only the applicator assembly and shaft are illustrated. It should be understood, however, the adhesive applicator assembly illustrated in the drawings is intended for use in conjunction with the above discussed elements of an envelope machine.

Referring to the drawings, and particularly to FIGS. 1-3, there is illustrated an adhesive applicator assembly generally designated by the numeral 10 that is secured to a shaft 12 rotatably mounted in the side frame members of the envelope machine in operative relation with an adhesive roll and a back-up roll.

The adhesive applicator assembly has a body portion 14 with a cylindrical passageway 16 therethrough for securing the assembly 10 to the shaft 12. The body portion 14 has a bottom wall 18, a pair of side walls 20 and 22 and a top wall 24. The top wall 24 has a pair of longitudinally extending inclined portions 26 and 28 that terminate in a pair of laterally extending horizontal portions 30 and 32. The body portion 14 has vertical bores or passageways 34, 35 and 36 opening into the top wall 24 that are arranged to receive springs, later described, that urge a gummer die holder generally designated by the numeral 38 away from the applicator body portion 14.

The body portion 14 has four vertical passageways 40 therethrough, two on each side of the shaft 12, that open into the bottom wall 18 and the horizontal portions 30 and 32 of the top wall 24. The vertical passageways 40 are threaded to receive threaded bolts 42. The bolts 42 extend upwardly beyond the body portion top wall horizontal portions 30 and 32. Extending upwardly from the body portion 14 are a pair of guide flanges 41 for the movement of the gummer die holder 38 therebetween.

The gummer die holder 38 has an arcuate upper surface 46 and an undersurface 48, the latter having substantially the same configuration as the body portion top wall 24 with inclined portions 50 and 52. The arcuate upper surface 46 has suitable threaded apertures 47 to secure gummer dies of different sizes thereto. Four horizontal flanges 54 extend laterally from the gummer die holder 38 adjacent the corners thereof. Each of the flanges 54 has an aperture 56 therethrough that is aligned with the respective vertical passageway 40 in the body portion. The bolt members 42 have a head portion 58 that serves as an outer stop member for the gummer die holder 38 and in an extended position of the gummer die holder, as illustrated in FIG. 2, abut the flange portions 54. The bolt members 42 extend through the apertures or passageways 56 in the horizontal flanges 54 and are threadedly secured in the respective vertical passageways 40. The bolts 42 have lock nuts 60 adjacent their lower end portion that abut the bottom wall 18 of the body portion 14. Suitable transverse slots are provided in the bolts 42 for adjustment by a screw driver or the like, of the relative distance between the respective flange 54 of the gummer die holder 38 and the horizontal surface 30 or 32 of the body portion 14. With this arrangement, the relative planar position of the gummer die arcuate upper surface 46 can be accurately adjusted by the rotation of the bolts 42 in the threaded passageways 40

of body portion 14. The gummer die holder 38 has vertical bores or passageways 62, 63 and 65 therein that are aligned with the bores or passageways 34, 35 and 36 in the top wall 24 of body portion 14. Spring members 44 are positioned in the aligned bores of the gummer die holder 38 and applicator body portion 14 and urge the gummer die holder 38 radially outwardly relative to the body portion 14.

The gummer die holder 38 has a pair of depending flange members 64 intermediate the end portions with transverse apertures therethrough. The body portion side wall has horizontal threaded bores 66 therethrough on substantially the same horizontal plane as the apertures in the gummer die holder depending flange members 64. A pair of L-shaped levers 68 and 70 are pivotally secured to the body portion side walls 20 and 22 by cap screws 72 that extend into the threaded bores 66. The end portion of each lever 68 and 70 is secured to the gummer die holder 38 by means of cap screws 74 extending into the aligned bores. With this arrangement, the pivoting of lever 68 about the cap screws 72 moves the gummer die holder 38 radially inwardly toward the axis of shaft 12 and thus retracts the gummer die holder 38 inwardly toward the inner portion of adhesive applicator assembly 10.

A flange member 76 extends downwardly from the body portion 14 and has a transverse aperture 78 therethrough. A piston cylinder assembly generally designated by the numeral 80 has a cylinder member 82 with an end cap 84 that has a longitudinally extending flange 86 with an aperture 88 therethrough. A pin member extending through the apertures 78 and 88 pivotally connects the piston cylinder assembly 80 to the body portion 14. The end cap 84 has an opening 90 therein for a conduit to provide air under pressure to the underside of a piston within the assembly 80. The piston cylinder assembly 80 has another end cap 92 with a vent aperture 94 therein. The piston rod 96 is connected to a transverse rod 98 that has end portions secured to the levers 68 and 70 by cap screws 100. With this arrangement, longitudinal axial movement of the piston rod 96 within the cylinder 82 pivots the lever 68 about the cap screw 72 to thus retract the gummer die holder 38. It should be understood that, although there has been described and illustrated an air operated piston cylinder assembly 80, that substantially the same movement for lever 68 may be obtained with an electrically actuated solenoid device that includes slip rings on the shaft 12.

With the above described adhesive applicator assembly, it is now possible to remotely retract the gummer die holder 38 inwardly toward the axis of shaft 12 and out of operative contact with the gummer roll and the back-up roll when the stream of envelope blanks being processed in the envelope machine is interrupted or when the envelope machine is stopped. Also with the above described arrangement, it is now possible to accurately adjust the planar relation of the die secured to the arcuate upper surface 46 of the gummer die holder 38 with the back-up roll that is parallel to the shaft 12 having the applicator assembly 10 mounted thereon. Thus the adjustment of the planar relation of gummer die holder 38 by means of bolts 42 adjusts the amount of pressure applied by the different

portions of the die as the die contacts the back-up roll with the envelope blank therebetween. This adjustment provides a means to apply an even film of adhesive to the envelope blank.

It is preferred that the retractable gummer die holder be arranged for a fail-safe type of assembly in that loss of air pressure maintains the die in an extended operative position. Application of air to the cylinder 82 moves the piston rod 96 outwardly and pivots lever 68 to retract the gummer die 38. It is also preferred to provide a time delay in the application of the air as, for example, during the jogging operation it is preferred that the gummer die remain in an extended position.

Referring to FIGS. 4-7, there is illustrated another embodiment of the adhesive applicator in which a substantial number of parts are the same as the applicator illustrated in FIGS. 1-3 and similar numerals will be used to designate similar parts.

The applicator body portion 14 has four vertical passageways 40 therein for the bolts 42. The passageways each have a counterbore 102 therein for springs 104. The springs 104 are arranged to abut the base of the counterbore 102 at one end and the underside of the flanges 54 of the gummer die holder 38 at the other end. With this arrangement, the springs 104 are arranged to urge the gummer die holder 38 radially away from the applicator body portion 14.

The applicator body portion 14 has a pair of upstanding guide pin members 106 and 108. The gummer die holder 38 has a pair of laterally extending guide members 110 and 112 with recessed portions 114 and 116 therein. The guide members 110 and 112 are secured to the end walls with the guide pins 106 and 108 on the applicator body portion 14 positioned in the recessed portions 114 and 116.

The pins 106 and 108 in the recessed portions 114 and 116 of members 110 and 112 serve to guide the gummer die holder 38 vertically relative to the applicator body portion 14.

The embodiment illustrated in FIGS. 4-6 differs from the embodiment illustrated in FIGS. 1-3 in that the spring members 104 are positioned around the bolts 42 in the latter embodiment whereas, aligned bores are provided for the spring members 44 in first described embodiment. Also, the embodiment illustrated in FIGS. 4-6 includes the guide members 110 and 112 and guide pin members 106 and 108 to guide the gummer die holder 38 relative to the applicator body portion 14.

According to the provisions of the patent statutes, we have explained the principle, preferred construction and mode of operation of our invention and have illustrated and described what we now consider to represent its best embodiment. However, it should be understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. An adhesive applicator for an envelope machine comprising,
  - a shaft member arranged to be rotatably mounted on an envelope machine,
  - an adhesive applicator assembly having a body portion with an outer peripheral surface, said body portion mounted on said shaft member and extending radially therefrom,

a gummer die holder mounted on said body portion in overlying relation with said body portion outer peripheral surface,  
 means movably securing said gummer die holder to said applicator body portion, said gummer die holder being movable radially toward and away from said applicator assembly body portion,  
 resilient means to urge said gummer die holder away from said applicator assembly body portion,  
 stop means limiting radial outward movement of said gummer die holder relative to said applicator body portion,  
 power operated means to move said gummer die holder radially toward said applicator assembly body portion, and  
 said power operated means includes a fluid actuated mechanism connected to said body portion and said gummer die holder, said fluid actuated mechanism extending longitudinally of said shaft member, said fluid actuated mechanism operable to move said gummer die holder relative to said body portion.

2. An adhesive applicator for an envelope machine as set forth in claim 1 in which,  
 said body portion includes a plurality of spaced passageways therein,  
 said gummer die holder having a plurality of other spaced passageways aligned with said passageways in said body portion, and  
 bolt means extending through said aligned passageways and connecting said gummer die holder to said body portion.

3. An adhesive applicator for an envelope machine as set forth in claim 2 in which,  
 said body portion passageways include threaded portions to threadedly secure said bolt means therein, said resilient means positioned around said bolt means within a portion of said passageway and abutting the underside of said gummer die holder.

4. An adhesive applicator for an envelope machine as set forth in claim 3 in which,  
 said body portion has a bottom wall, a top wall and a pair of side walls,  
 said plurality of spaced passageways extending parallel to said side walls and opening into said bottom wall and top wall, and  
 said bolt means extending through said bottom wall

so that rotation of selected ones of said bolt means adjacent said bottom wall adjusts the planar relation of said gummer die holder relative to said body portion top wall.

5. An adhesive applicator for an envelope machine as set forth in claim 1 in which said power operated means includes,  
 a piston cylinder assembly having the cylinder pivotally connected to said body portion and the piston rod connected to said gummer die holder so that movement of said piston rod longitudinally of said shaft member relative to said cylinder moves said gummer die holder radially inwardly relative to said body portion.

6. An adhesive applicator for an envelope machine as set forth in claim 5 which includes,  
 a pair of L-shaped levers positioned on opposite sides of said shaft member, said levers pivotally connected to said body portion side walls intermediate said lever end portions and connected at one end to said piston rod and at the other end to said gummer die holder so that movement of said piston pivots said levers and moves said gummer die holder relative to said body portion.

7. An adhesive applicator for an envelope machine as set forth in claim 1 which includes,  
 a plurality of vertical bores in said applicator body portion,  
 a plurality of other vertical bores in said gummer die holder, said other vertical bores positioned in aligned relation with said first named bores in said body portion, and  
 said resilient means positioned in said aligned bores and arranged to urge said gummer die holder radially away from said applicator body portion.

8. An adhesive applicator for an envelope machine as set forth in claim 1 which includes,  
 a pair of guide members extending laterally from the ends of said gummer die body portion, said guide members having recessed portions therein,  
 a pair of guide pin members extending upwardly from said applicator body portion in spaced relation to each other, and  
 said guide pin members positioned in said guide member recessed portions to guide said gummer die holder relative to said applicator body portion.

\* \* \* \* \*

50

55

60

65