

[54] **APPLICATOR FOR CONTROLLABLY
APPLYING A LIQUID DEPOSIT TO
VARIOUS WORKPIECES**

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[51] Int. Cl. **B05g 1/08**

[58] Field of Search **118/261**

[56] **References Cited**

UNITED STATES PATENTS

1,834,435	12/1931	Steere	118/261 X
2,290,803	7/1942	Dillman et al.	118/261 X
3,122,767	3/1964	Carvill	118/261 X
3,623,451	11/1971	Burgess et al.	118/261 X

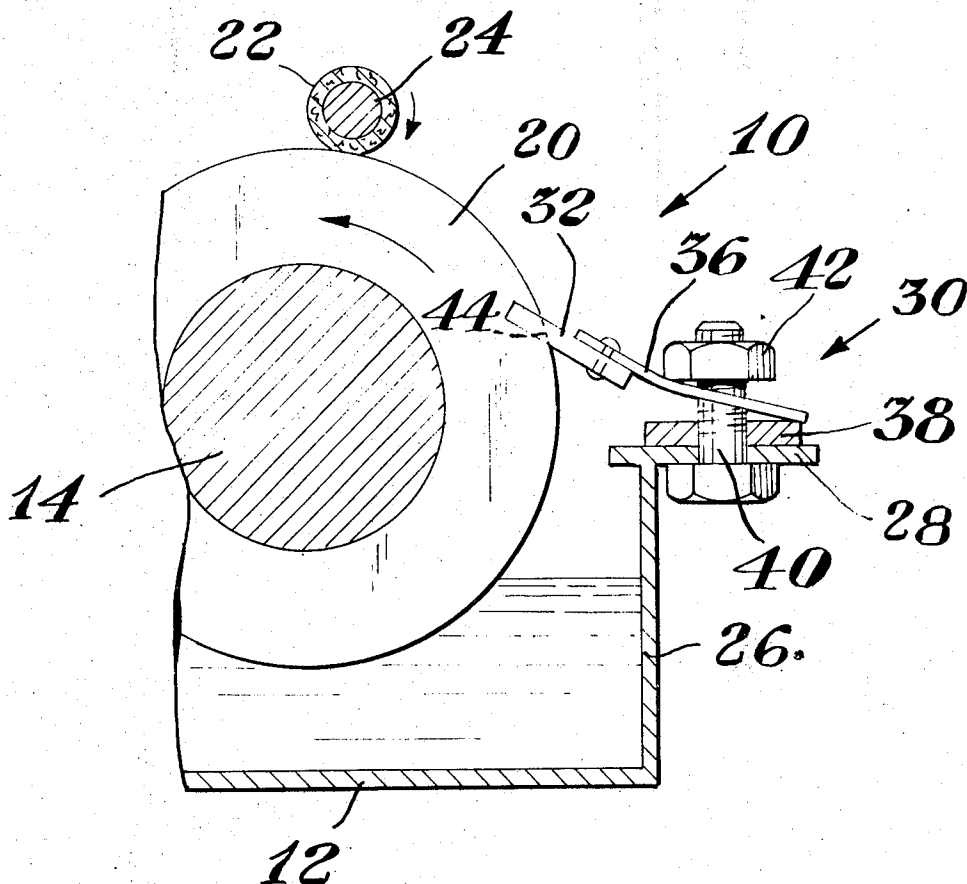
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ABSTRACT

In an applicator for controllably applying a liquid substance such as glue to a workpiece, there is provided a pickup roll, a reservoir for supplying such roll, means for retaining the workpiece in momentary or moving association with such roll for transfer of the liquid substance thereto, a doctor blade including a shoe element for continuously wiping the roll, a resilient arm such as a leaf spring attached to the shoe, and means for deformably biasing such arm to control the pressure of the shoe against the roll. The blade assembly is compact, is readily adjustable for application of a changeable but constant force to the shoe, and is insensitive to "freezing up" or other impairment such as by spillage or gradual depositing of such substance thereon.

3 Claims, 2 Drawing Figures



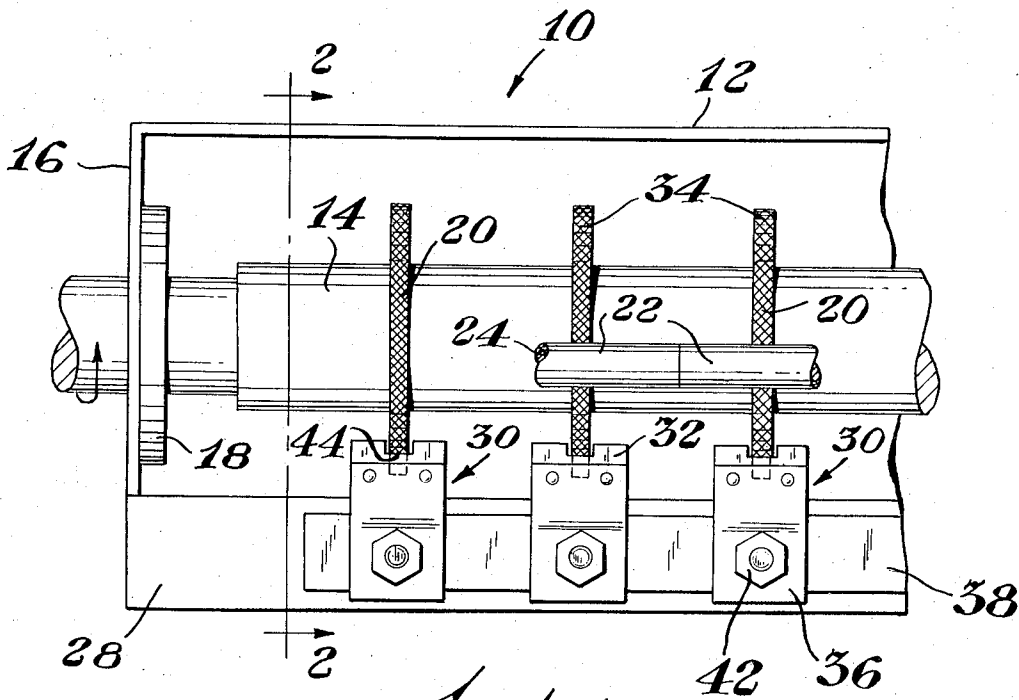


Fig. 1

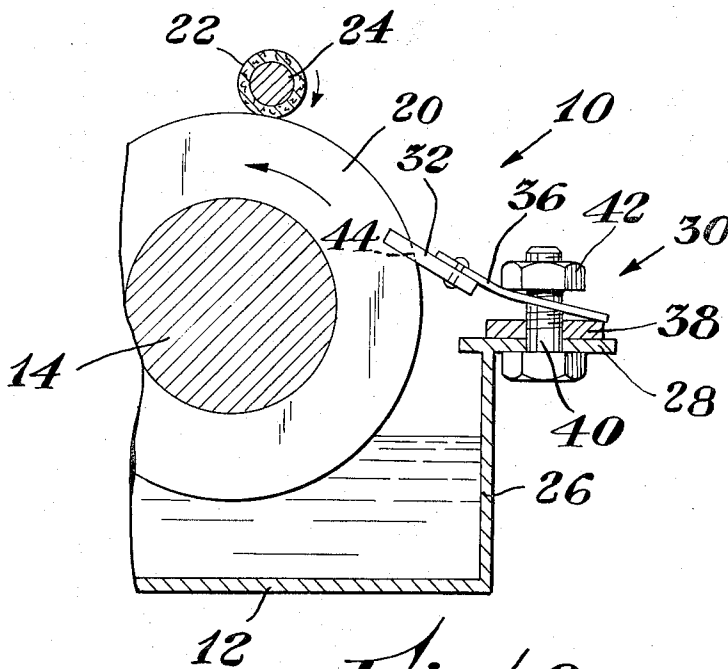


Fig. 2

APPLICATOR FOR CONTROLLABLY APPLYING A LIQUID DEPOSIT TO VARIOUS WORKPIECES

The present invention relates particularly to an applicator for controllably applying glue or a like substance to a workpiece through means of a pickup roll, a reservoir for depositing such substance on the surface of revolution of such roll, and a means for retaining a workpiece in generally nip association with the pickup roll for transfer of such fluid substance thereto at a region remote from the pickup area.

More particularly the invention relates to such an applicator having incorporated therein, a novel doctor blade for controllably removing excess substance from the pickup roll to assure a relatively uniform and controlled transfer of a certain quantity thereof to the workpiece.

In the practice prior to this invention, the doctor blade for such an applicator would frequently consist of a rigid member or shoe in wiping association against the pickup roll, the shoe being manually adjustable such as by a slot and wing nut combination. Depending on the specific operation and substance to be applied, such a blade would require various degrees of attendance and adjustment to accommodate wear, and to control the proximity and/or pressure of the wiping face against the pickup roll. In certain industries, as many as 50 or more of such pickup rolls and associated blade assemblies may be operated in series. Thus, it can be appreciated that a considerable amount of time can be wasted in attendance and adjustment of each of the individual blade assemblies.

The art has suggested certain automatically adjusting blades, but such, as constructed heretofore, are oftentimes highly sensitive to contamination. For example, it is difficult to entirely prevent glue, paper, dust, cuttings, and like debris, from accumulating in and about the applicator. Particularly glue contamination can rapidly accumulate in moving parts and surfaces, and tend to "freeze up" an automatic blade, in turn, necessitating frequent maintenance and cleaning time.

Accordingly, it would be particularly advantageous and beneficial if there were available in an applicator, such as for glue, a doctor blade assembly which required little or no attention and general maintenance.

It would be a further advantage if such an assembly were compact, readily adjustable for application of a pre-set constant shoe pressure to the pickup roll; and, further, if such an assembly were constructed in such a manner so as to be substantially insensitive to "freezing up" or other impairment such as may be caused by spillage or depositing of corrosive or tacky fluid on moving parts.

These features and other advantages are obtained in an applicator wherein there is provided a plurality of pickup rolls rotatable about a common axis and spaced apart in the axial direction, such rolls being adapted to rotationally dip into a reservoir containing a fluid to be applied, means to retain a workpiece in association with such pickup rolls for transfer of such fluid thereto, the improvement of which comprises, a doctor blade assembly associated with each such pickup roll, and each comprising a shoe element, a resilient arm means retaining such shoe element in wiping association against the surface of revolution of such pickup roll, and means to be deformably bias such arm means to re-

siliently urge such shoe element into following relationship against such surface.

Further features and advantages in accordance with the present invention will become more apparent from the following specification taken in conjunction with the drawing wherein:

FIG. 1 is a plan view of an applicator for applying glue to paper core elements, and which applicator embodies a plurality of glue pickup rolls, each having associated therewith a doctor blade assembly constructed according to the general teachings and principles of this invention; and

FIG. 2 is a side elevational view of the device of FIG. 1 taken along reference line 2—2 thereof, and which shows certain parts of such applicator in cross-section.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring now to the drawing, there is illustrated a glue applicator 10 including a generally rectangular trough or reservoir 12 in which a supply of glue is stored and maintained in liquid form. A shaft 14 is disposed centrally within reservoir 12. An end panel 16 of the reservoir includes a bearing housing 18 in which one end of the shaft is journeyably carried, the opposite end of the shaft being carried in like fashion, but not illustrated. The shaft is extended outwardly from end panel 16 for connection to a suitable rotational drive source, not shown. A plurality of like pickup rolls or wheels 20 are affixed to shaft 14, and are spaced apart generally uniformly thereon in the axial direction. The lower extents of the pickup rolls dip into the reservoir, and the upper extents thereof are generally in nip engagement with a hollow cylindrical workpiece, such as a paper core element or a plurality of such elements as denoted at 22. The core elements are retained in such nip engagement by a rotatable mandrel 24, which is received in the hollow central part of each such core.

The reservoir includes a front panel 26 having a rigid, horizontal shelf or mounting plate 28, the latter being affixed to and coextensive with the upper edge of the front panel. A plurality of doctor blade assemblies 30, each associated with a respective pickup roll, are mounted in linear series on plate 28. Each blade assembly includes a slotted shoe or wiper head 32 adapted to ride in wiping association against the surface of revolution 34 of a respective pickup roll. A flat resilient arm 36, such as of spring metal, preferably a leaf spring, is affixed to each wiper head and extends outwardly therefrom and rests against a secondary plate 38, which is affixed flatly against the top surface of plate 28. The middle part of each arm is apertured to receive a vertical bolt element or biasing means 40, which also extends through the plate 28, and the secondary plate 38. By turning a nut 42, associated with such bolt, the arm is biased to a certain setting, and transfers such bias to the wiper head to control the amount of pressure applied by such head against the pickup roll.

In operation, the shaft 14 is preferably rotated at constant speed, causing each pickup roll to continuously dip into the reservoir, and pick up a coating of liquid glue on its surface of revolution 34, the latter being preferably knurled as indicated to assist such purpose. The setting of the biasing means 40 controls the wiping pressure, and ultimately the amount of glue transferred to the core elements, under any given operating condi-

tions. Nip contact between the core elements and the pickup rolls, rotates mandrel 24 such that the glue is applied circumferentially to the surface of each core element.

In embodiments of various apparatus companion with the glue applicator described herein, a plurality of mandrels 24 are preferably mounted on a turret assembly which revolves to automatically bring in fresh core elements responsive to a certain cycle of operation. Such core elements can be in the form of a unitary elongated core which after application of the glue is slit into desired lengths or, alternately, the elongated core can be pre-slit prior to the glue applying step. In either event, the glue applying operation is essentially the same. The deposited glue permits the forward edge of a web of paper, film, or the like, for example, to be readily "tacked" to the surface of the core element, to begin winding of the same thereon at fast speed. For reference purposes a more detailed description of such turret, core slitting, and film winding apparatus, and with an associated glue applicator of the prior art construction, is illustrated in U. S. Pat. No. 3,179,348.

Referring now to some specifics of the glue applicator, the pickup rolls 20 are preferably manufactured from hardened steel for long wearing purpose. The wear is most desirably taken by the wiper heads which for such purpose are preferably constructed of softer metal, most preferably a brass metal. As the wiping face 44 of each head is worn back, the resilient arm structure as taught herein will automatically gradually

readjust the position of the wiping head to automatically obtain effective doctoring of pickup rolls 20.

As may well be appreciated, the attached drawing shows a preferred form of the invention. Obviously structural changes may be made therein without departing from the spirit and scope of the invention. Accordingly it is intended that the invention only be limited by the breadth of the appended claims.

What is claimed is:

1. In an applicator wherein there is provided a plurality of pickup rolls rotatable about a common axis and spaced apart in the axial direction, such rolls being adapted to rotationally dip into a reservoir containing a fluid to be applied, means to retain a workpiece in association with such pickup rolls for transfer of such fluid thereto, the improvement of which comprises, a self-adjusting doctor blade assembly associated with each such pickup roll, and each comprising a shoe element, a resiliently deformable arm means retaining such shoe element in wiping association against the surface of revolution of such pickup roll, and means to deformably bias such arm means to resiliently urge such shoe element into following relationship against such surface.

2. The applicator of claim 1 wherein such arm means comprises spring metal.

3. The applicator of claim 1 wherein such arm means comprises a leaf spring.

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