March 6, 1973 B. PAHLITZSCH 3,719,167

DEVICE FOR APPLYING ADHESIVE TO ENVELOPES, BAGS OR THE LIKE

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Fig. 1

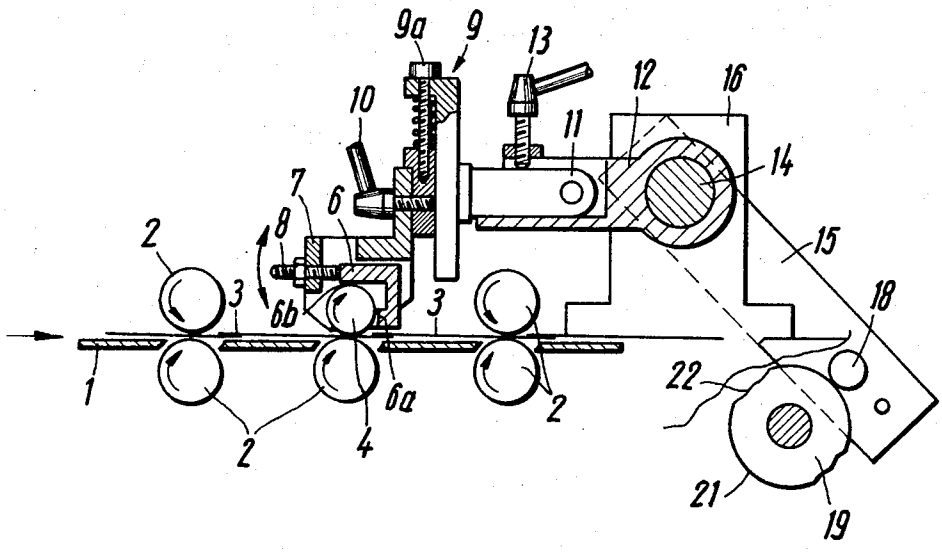

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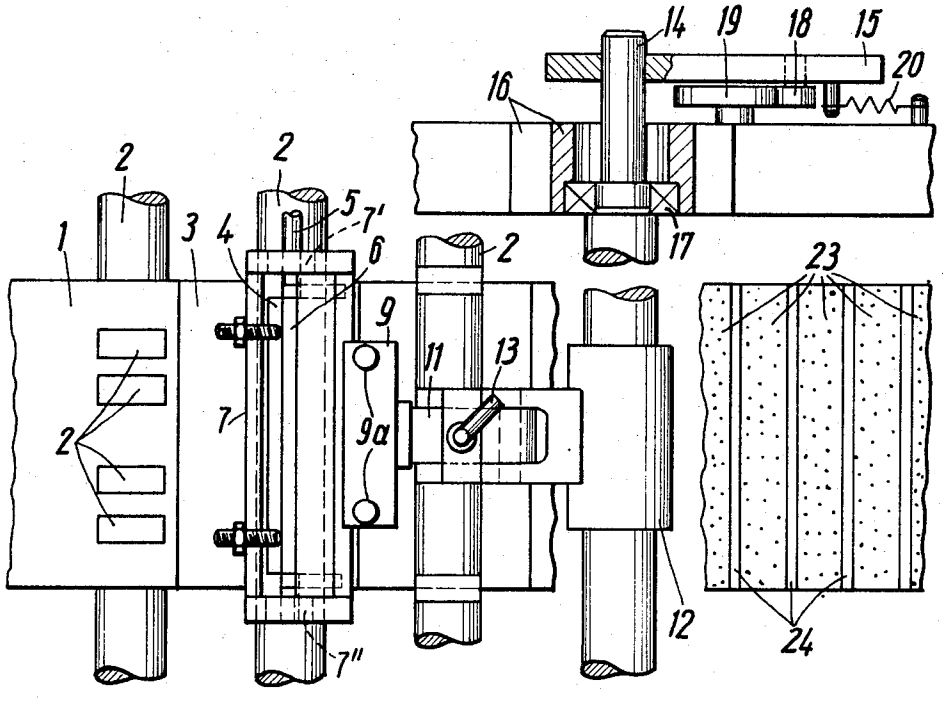
Fig. 2



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DEVICE FOR APPLYING ADHESIVE TO ENVELOPES, BAGS OR THE LIKE

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ABSTRACT OF THE DISCLOSURE

A gumming roller for applying self-sealing latex adhesive to a series of overlapping envelopes is rotated in opposition to the direction of conveyance of the envelopes so that all or nearly all of the adhesive is wiped off the roller onto their exposed flaps. The roller is cyclically lifted, together with an associated adhesive reservoir off the envelopes to produce two separate bands of adhesive on each envelope, one band on the flap and another band on the body of the envelope.

The present invention relates to a device for applying adhesive to envelopes, bags or the like, particularly in connection with the use of a so-called self-sealing adhesive.

In a known process for making letter envelopes, blanks cut from a reel or drawn from a stack are subjected to a series of steps in which, first of all, side flaps and a base flap are folded and stuck together; thereafter, the envelopes each with a remaining flap open are stacked in overlapping fashion so that those parts of the flaps which are to be provided with the adhesive are left exposed. The adhesive is applied by means of a roller, hereinafter called a gumming roller, supplied with the adhesive.

In one known device for the application of adhesive, a gumming roller rotates in the direction of transfer of the overlapping envelopes, the peripheral speed of the gumming roller being equivalent to the transfer speed of the envelopes. Thus, the liquid adhesive is applied to the exposed parts of the envelope flaps in a rolling fashion. This known device operates satisfactorily as long as it is dealing with a conventional adhesive in the form of a gum which has to be moistened to close the envelope.

When applying the self-sealing kind of adhesive, however, this device has substantial drawbacks. During the rolling process, carried out with constant speed and direction of rotation the latex rubber contained in the adhesive mass, which consists of latex dissolved in salamonniac, is indeed spread over the exposed flaps of the envelopes; however, during continuous operation, irregularities in the gumming process occur as hardened latex granules are applied to the surfaces being gummed and have an undesired effect at the time of closure of the envelope. I have found that this formation of hard latex granules on the envelope flaps can be traced back to the fact that the latex adhesive is not fully transferred from the roller and instead a layer of adhesive remains behind on that roller which rapidly hardens and, in so doing, transfers the granular formations to the flaps being gummed.

The object of the present invention is to overcome this drawback and to create a self-sealing gum coating which is free of any faults and of any granules of hardened latex adhesive.

According to the invention a gumming roller for envelopes, bags or similar flat articles is arranged to be supplied with a flowable adhesive from a reservoir and is driven independently of the article conveying means

in opposition to the transport direction of the articles to be gummed.

By this means the latex adhesive is removed fully from the roller so that there can be no question of any hardening of the adhesive on said roller since the latter is supplied continuously and exclusively with fresh adhesive taken from the reservoir. This complete removal of the adhesive from the roller surface is due to the fact that the gumming roller rotates in the opposite direction to the movement of the envelopes so that, as it were, the adhesive is actually scraped off the roller. This measure ensures proper application of the adhesive without any risk of the formation on the roller of residues which, when a self-sealing adhesive is used, would inevitably lead to the formation of hard latex granules on the gummed surfaces.

Preferably the drive of the gumming roller can be adjusted to give different peripheral speeds. Thus, the rate of application of the self-sealing adhesive can be adapted to the particular composition of the latex composition so that trouble-free spreading thereof is ensured.

In an advantageous embodiment of my invention, the reservoir carries the gumming roller, is sealed off in air-tight fashion and is formed with respective slots extending over the length of the gumming roller serving on the one hand to discharge the adhesive and on the other to readmit any excess adhesive adhering to the roller.

In order to obtain strip-like, uninterrupted application of the adhesive, I prefer to provide means whereby the reservoir along with the gumming roller can be lifted rhythmically by the envelopes as a function of their transport speed. The reservoir may be secured to one end of a bellcrank lever which is arranged to pivot approximately about its center and whose other end co-operates with a cam track controlling the rhythmic lifting of the gumming roller.

A cam disc used for this purpose may be provided with dwells of differing diameter and length, a dwell of larger diameter corresponding to the width of the gumming strip and a dwell of smaller diameter corresponding to the ungummed interval between the strips.

With envelopes which are arranged in a staggered relationship one below the other and which are to be provided with a self-sealing adhesive, it is necessary to apply the gum in interrupted strips so that the flap to be gummed and the rear edge of the envelope, which is also to be gummed, are not linked by a continuous gum strip. Between these two surfaces to be gummed there must thus be a latex-free zone which can be created by the periodic lifting of the reservoir carrying the gumming roller so that the gum application is briefly interrupted whenever necessary. The use of a cam disc to control the lifting movement is an advantage inasmuch as the cam can be positively driven as a function of the operating cycle of the machine and the length of the time of lift can be adjusted by the smaller-diameter cam so that the desired ungummed zone has the necessary width.

The accompanying drawing shows a preferred embodiment of the invention. In the drawing:

FIG. 1 is a sectional lateral elevation of a device embodying my invention; and

FIG. 2 is a plan view of the device.

In the preferred embodiment illustrated in the drawing, envelopes or bags 3, arranged in mutually overlapping fashion for gumming purposes are transported by feed rollers 2 on a conveyor path 1 and pass beneath a gumming roller 4 which rotates in a direction opposite to the transport direction left to right of the envelopes 3. The gumming roller 4 is driven by a shaft 5 with its own independent drive mechanism (not shown) whose speed can be adjusted. In contact with the gumming roller 4 there is a reservoir 6 which is closed off in an air-tight fashion

and contains latex adhesive. Between the closed reservoir **6** and the gumming roller **4** two slots **6***a* and **6***b* are formed, the adhesive exiting through the slot **6***a* and any residual adhesive being returned through the slot **6***b* to the reservoir **6**. The reservoir **6** is mounted upon a bracket **7** which is provided with a pair of screws **8** for accurate adjustment of the width of slot **6***a*. The bracket **7** is secured to a standard **9**, spring-loaded screws **9***a* thereover serving to adjust the width of slot **6***b*. The attachment of the bracket **7** to the standard **9** is effected by a toggle bar **10**. The standard **9** has a horizontal arm **11** which is fixedly held in an arm **12** by means of a pinch screw **13**. As FIG. 2 shows, the arm **12** is secured to a shaft **14** which is rotatably mounted in a side plate **16** of the machine frame in a bearing **17**. At the end of the shaft **14** a second lever **15** is attached, this lever carrying a roller **18** held by a spring **20** into contact with a rotating cam **19**. The cam **19** has longer dwells **21** of larger diameter and shorter dwells **22** of smaller diameter. By means of the cam **19**, operating through the lever system **15**, **12**, the gumming roller **4** is lifted radially off the staggered envelopes **3** as the roller **18** comes into engagement with the smaller-diameter dwells **22**. This means that the adhesive is applied in the form of gummed strips **23** with intervening ungummed narrower strips **24**.

It will be noted that the lower slot **6***a*, serving to dispense the adhesive composition, is formed between the gumming roller **4** and a lower wall of the housing of reservoir **6** extending generally radially toward that roller, the upper slot **6***b* for the return of excess adhesive being defined by the crest of the roller and an overhanging upper housing wall of the reservoir. Thus, roller **4** adjoins an open side of the reservoir, formed between these two walls, and (as indicated by the arrow in FIG. 1) rotates across that open side through an arc of substantially 90°, representing the effective peripheral spacing of the two slots, in a direction from upper slot **6***b* to lower slot **6***a*. The relative position of roller **4** and reservoir **6** on their common support **9** remains, of course, unchanged during the alternate raising and lowering of the support by the cam **19**; this position can be varied only by operation of the two sets of screws **8** and **9***a* (upon the unclamping of bracket **7** by toggle bar **10**), these two sets of adjusting screws being effective in mutually orthogonal directions (horizontal and vertically, respectively). In order to insure the necessary relative mobility between the bracket **7** with reservoir **6** and the gumming roller **4**, the shaft **5** of this roller passes with clearance through side walls of the bracket as shown at **7'** and **7''** in FIG. 2. The connection between support **9** and shaft **5**, required to raise and lower the roller jointly with reservoir **6**, has not been illustrated.

I claim:

1. A device for applying adhesive to a series of flat articles moving along a predetermined transport path, comprising:

a reservoir above said path containing a flowable adhesive composition, said reservoir having an open side;

a vertically movable support for said reservoir;

a horizontal gumming roller rotatably journaled on said support adjacent said open side with access to the contents of said reservoir, the latter defining with said roller a pair of slots spaced apart substantially 90° along the roller periphery for dispensing said composition and for a return of excess adhesive to said reservoir, said roller projecting downwardly beyond said reservoir for contact with said articles;

transport means for continuously moving said articles along said path underneath said roller and said reservoir;

drive means for periodically raising said support together with said reservoir and said roller, thereby intermittently lifting the latter off said articles to spread the adhesive thereon in spaced-apart zones; and

mutually independent adjustment means on said support for varying the relative position of said roller and said reservoir thereon in two mutually orthogonal directions, thereby individually changing the width of said slots.

2. A device as defined in claim **1** wherein said adjustment means comprise first and second screw means for relatively shifting said reservoir and said roller in a horizontal and vertical direction.

3. A device as defined in claim **2** wherein said reservoir has a longer upper wall overlying said roller and defining therewith one of said slots, said reservoir further having a shorter lower wall extending generally radially toward said roller and defining therewith the other of said slots.

4. A device as defined in claim **3** wherein said roller is provided with means for rotating same past said open side in a direction from said one to said other of said slots.

5. A device as defined in claim **4** wherein the direction of rotation of said roller is opposite the direction of motion of said articles by said transport means.

6. A device as defined in claim **1** wherein said drive means comprises a cam disk with a longer dwell for lowering said support and a shorter dwell for raising said support.

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