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SELF-CLEANING ADHESIVE DOCTORING DEVICE

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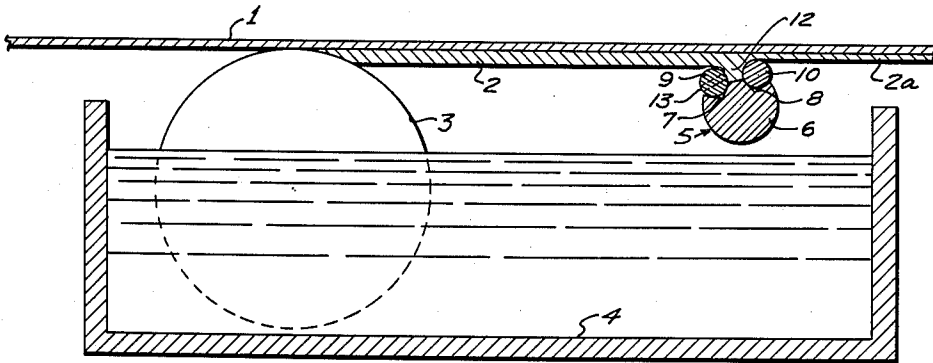


FIG. 1.

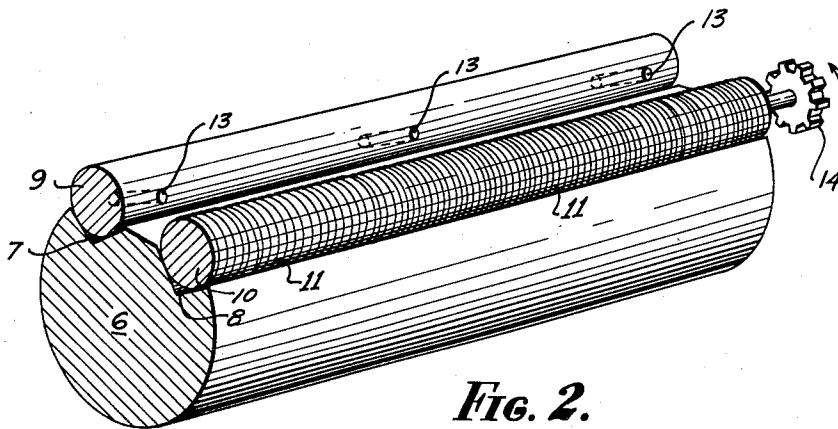


FIG. 2.

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SELF-CLEANING ADHESIVE DOCTORING DEVICE

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4 Claims. (Cl. 118—104)

This invention relates to adhesive applicators and more particularly to a device for forming a smooth, even and continuous film of adhesive or like substances on a moving web of paper, paperboard or other similar material.

While various forms of applicators have hitherto been proposed to apply a layer of film of adhesive to a moving web, considerable difficulty has been encountered in smoothing the applied layer to a uniform, thin condition. While it has hitherto been proposed to utilize doctors, smoothing rods and the like to smooth such coatings, the adhesives tend to accumulate and dry on the smoothing instrumentality with the result that it soon becomes clogged and ineffective for its intended purpose.

Accordingly, a principal object of the instant invention is the provision of an improved adhesive doctoring device which is highly effective in providing a smooth, thin and uniform film of adhesive on a moving web, the device being self-cleaning in spite of the natural tendencies of the applied adhesive to dry.

The foregoing, together with other objects with the invention which will appear here and after or which will be apparent to the skilled worker and the art upon reading these specifications, I obtain by that construction and arrangement of parts of which I shall now describe an exemplary embodiment.

The reference is now made accompanying drawing wherein:

FIGURE 1 is diagrammatic elevational view of an adhesive smoothing device in accordance with the invention.

FIGURE 2 is an enlarged fragmentary perspective view of the self-cleaning smoothing bar.

In accordance with the invention, the layer of adhesive 2 is initially applied to the moving web 1 by means of an applicator roll 3 moving in an adhesive pan or glue pot 4, the applicator roll acting to apply the layer of adhesive to the under surface of the web 1. From the outset, it will be understood that the form of the applicator roll shown is exemplary only and does not constitute a limitation on the invention in that the initial application of the adhesive to the web could be accomplished by other forms of roll applicators and the like. For example, a reverse roll coater could be employed, or the adhesive could be applied by a series of rolls, the first of which dips into the adhesive pan and acts to transfer the adhesive to a second roll which in turn contacts a third or applicator roll.

In accordance with the invention the applied layer of adhesive, irrespective of the manner in which it is initially applied, is smoothed by means of the smoothing device 5 located beyond the applicator roll and preferably within the confines of the glue pot 4. The smoothing device comprises a supporting bar 6 having spaced apart pair of longitudinal channels 7 and 8 formed therein. The supporting bar 6 is arranged to extend transversely of the web 1, and the leading channel 7, i.e. the channel nearest the applicator roll 3, is provided with a smooth cylindrical rod 9 so positioned as to lie slightly beneath the web 1 and out of direct contact with the adhesive layer thereon.

The trailing channel 8 supports a wire-wound rod 10 which contacts the layer of adhesive 2 on the web and acts to smooth the layer. In an exemplary embodiment, the wire-wound rod 10 is a No. 4 rod, which means that

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the rod is wound with 4-thousandths diameter stainless steel wire. The fine wound wire, designated at 11 in FIGURE 2, acts to smooth the applied layer of adhesive into an extremely thin film 2a. The size of the wound wire does not constitute a limitation on the invention in that the diameter of the wire may be varied depending upon the desired thickness of the finished coating. Thus, while a No. 4 rod is preferred where an extremely thin adhesive film is desired, heavier, i.e., large diameter, wire may be employed.

With arrangement just described a small pool of adhesive 12 forms between the rods 9 and 10; and I have found that this small pool of adhesive acts to make the wire-wound rod self-cleaning. Where a wire-wound rod is employed by itself, it soon becomes clogged with adhesive; but where it is arranged to be in communication with the pool 12, the smoothing rod remains free from dry particles of adhesive, paper dust, and the like.

The rods 9 and 10, in effect, form a trough and adhesive removed from the moving web flows into and along the trough and out both ends thereof, from which it may flow back into the glue pot. To this end it is desirable that the smoothing device be positioned within the pot, as illustrated, or above a supplementary receptacle which is in communication in the pot.

In practice, I have found that the quantity of adhesive initially applied to the web from the applicator roll 3 will be more than sufficient to fill the pool 12, with the result that the pool will continually overflow for return to the supply pan. In the case of a wider web, I have found it desirable to provide one or more outlet ports 13 in the rod 9 through which the adhesive may flow, thereby preventing overflowing of the pool. It will be understood, of course, that the size of the ports 13 will be sufficiently small so that the pool will not be lost.

It will be understood that modifications may be made in the invention without departing from the spirit and the purpose of it. For example, while for most uses the wire-wound rod will be wholly self-cleaning by reason of its contact with the adhesive pool, it is also contemplated that the rod may be rotated at a slow speed, as by means of gear 14 seen in FIGURE 2, the gear acting to rotate the rod in a direction opposite the direction of travel of the web being coated, as indicated by the arrow.

Having thus described my invention in an exemplary embodiment, what I desire to secure and protect by Letters Patent is:

1. In a device for smoothing and metering a layer of adhesive and the like applied to the under surface of a generally horizontally disposed moving web, a support mounting a wire wound rod extending transversely of the moving web and positioned to contact the layer of adhesive thereon, and trough defining means mounted on said support in advance of said wire wound rod, said trough defining means providing a barrier wall coacting with said wire wound rod to define an adhesive receiving trough therebetween, said barrier wall having its upper surface disposed slightly below the upper surface of said wire wound rod so as to be free from contact with the adhesive layer on said coated web, whereby adhesive removed from the web by said wire wound rod will be collected in said trough to form a pool of adhesive which, by reason of its contact with said wire wound rod, will render said rod self-cleaning.

2. The device claimed in claim 1 wherein said wire wound rod is rotatable, and wherein means are provided for rotating said wire wound rod in a direction opposite to the direction of movement of the coated web.

3. The device claimed in claim 1 wherein said trough defining means comprises a second rod extending in parallel relation to said wire wound rod, and wherein said sup-

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port comprises a supporting bar underlying said two rods, said supporting bar extending transversely of the direction of movement of the coated web and having a pair of spaced apart channels extending lengthwise therein in which the said rods are received.

4. The device claimed in claim 3 wherein said second rod has a plurality of spaced apart ports therein positioned to drain excessive adhesive from said trough.

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