June 9, 1953 R. F. W. TRANTER 2,641,219

APPARATUS FOR APPLYING ADHESIVE TO MOVING SHEETS

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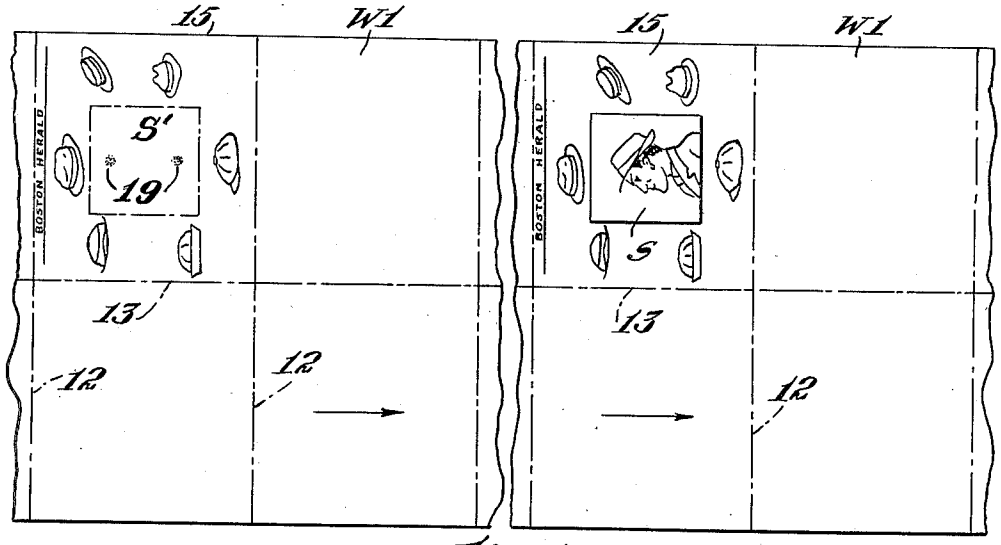


Fig. 1

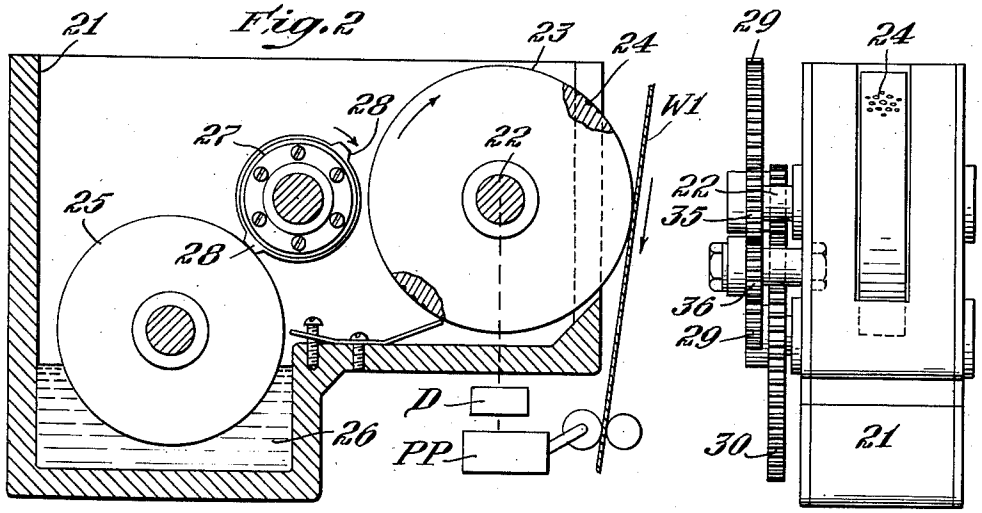


Fig. 2

Fig. 3

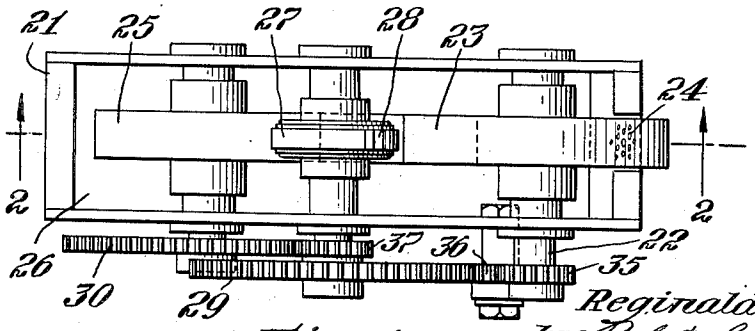


Fig. 4

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APPARATUS FOR APPLYING ADHESIVE TO MOVING SHEETS

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4 Claims. (Cl. 118—212)

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In the production of newspapers it may be desired to apply adhesive at recurrent locations along a web of newsprint for the purpose of attaching insert sheets at those locations (as disclosed in my copending application Serial No. 731,763, filed March 1, 1947, now United States Patent No. 2,600,284 issued June 10, 1952 of which this application is a continuation-in-part or for other purposes. In slow speed web feeding machines it is common to apply adhesive to the moving web by means of a drum or applicator roll rotating at the same peripheral speed as the web and in non-slipping contact with the web, adhesive being applied to the periphery of the aplicator roll from a transfer roll which is associated with a reservoir or similar source of adhesive. In newspaper presses, however, the web of newsprint travels at such high speed, usually in the order of 1200' per minute that the customary applicator and transfer roll would rotate so rapidly as to throw the adhesive from their peripheries.

An object of the present invention is to provide adhesive-applying apparatus which is capable of operating at the high speed of a newspaper press without throwing the adhesive owing to the unusual centrifugal forces involved. Another object is to apply separate patches or spots of controlled amounts of adhesive.

In one aspect the invention comprises an applicator roll having in its periphery a small well or indentation of size to hold a drop of adhesive by molecular force, an applicator rotor having an adhesive carrying protuberance, means for supplying adhesive to the rotor, and means interconnecting the applicator roll and transfer rotor to drive the roller in synchronism with but at a slower speed than the roller so that the rotor protuberances wipes a drop of adhesive into the well from a direction opposite to the direction of motion of the well to fill the well and remove excess adhesive from the periphery of the applicator roll, said protuberance having a substantially smaller effective radius than the roll to minimize the centrifugal force of motion of the protuberance and the molecular force of the well counteracting centrifugal force of motion of the applicator roll, whereby spattering of adhesive from the transfer rotor and applicator roll is prevented. By molecular force is meant one or more of the attractive forces such as capillary action, cohesion and adhesion between molecules of the adhesive and of the wells. Preferably the aforesaid protuberance has a resilient tip portion which removes excess adhesive from the periphery of

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the applicator roll by squeegee action. If a larger spot of glue is to be applied to the web a group of closely spaced wells are provided, the protuberance being designed to cover the group.

In a more specific aspect the means for supplying adhesive to the transfer rotor comprises a reservoir of adhesive, a roll dipping in the reservoir to pick up a peripheral film of adhesive, and means for driving the dipping roll at a linear speed substantially lower than that of the transfer protuberance.

In a further aspect the applicator roll carries a plurality of said small wells or groups of wells at spaced locations about its periphery, and said transfer rotor carries at least one protuberance for each well or group.

For the purpose of illustration typical embodiments of the invention are shown in the accompanying drawings in which

Fig. 1 is a plan view of a web of newsprint showing a printed page before and after a sheet has been applied thereto:

Fig. 2 is a section of the adhesive applicator taken on the line 2—2 of Fig. 4;

Fig. 3 is an end elevation of the applicator; and

Fig. 4 is a top plan of the applicator.

In the particular embodiment shown for the purpose of illustration sheets S are attached to a web W1 at S' by two spots of adhesive 19 for each sheet (Fig. 1). These spots are applied to the web W1 by the device shown in Figs. 2, 3 and 4. This device comprises a casing 21 which is open at the top and front and which is adjustably mounted on the press frame 1 for movement edgewise of the web W1 to apply adhesive to a selected page at a predetermined point thereon. Journalled in the casing on a shaft 22 is an applicator roll 23 which is driven at a surface speed equal to that of the webs and is provided with one or more groups of indentations or wells 24 at suitably spaced intervals around its periphery to receive liquid adhesive, the roll projecting out through the open front of the casing to contact the passing web W1 (Fig. 2). Adhesive is applied to the groups of indentations by means of a roller 25 dipping into a pool of adhesive 26 and an intermediate roller 27 having rubber protuberances 28 which pick up adhesive from the periphery of roll 25 and transfer the adhesive to indentations 24 on the roll 23. The three rolls 23, 25 and 27 are driven in unison by gearing 29, 30 and 35 to 37. The web W1 is driven by a printing press PP and, as shown in my earlier mentioned application, the adhesive applying device is synchronized by a device D with the printing press which drives

the web W1 so that the applicator roller **23** is driven at a peripheral speed normally equal to that of the web W1, although occasional changes of the applicator roll speed for the purpose of adjusting the position of the adhesive spots may cause momentary slippage between the roller and the web.

The applicator roll gear **35** is journalled on the shaft **22** and driven by the aforesaid synchronizing device (not shown). An idler gear **36** intermeshes with this gear **35** and with a reduction gear **29** which drive the transfer rotor **27**. As shown in Fig. 2 both the applicator roller **23** and the transfer rotor **27** are driven in a clockwise direction so that the protuberances **28** on the rotor and the wells **24** on the roller pass in opposite directions. The gear ratio between the roller **23** and the rotor **27** is selected to synchronize the roller and rotor so that one of the groups of wells is presented to a protuberance as the latter wipes adhesive on the roller. Gear **37** connected to gear **29**, and gear **38** connected to the dipping roll **25** drive the dipping roll at a speed reduced well below that of the transfer rotor. Owing to the resiliency of the rubber protuberance **28** and to its motion at a different speed than the wells, the transfer rotor protuberance not only deposits adhesive in the wells but squeeges excess adhesive from the periphery of the applicator roller **23** outside the wells. The wells are approximately the size of a drop of adhesive and hold adhesive by molecular attraction and adhesion so that the adhesive is not thrown or spattered from the applicator roller **23** despite its high peripheral speed.

As shown in Figs. 3 and 4 the gears are of such a ratio as to drive the transfer rotor at one fourth the revolutions of the applicator roller. Accordingly one group of wells **24** will be filled every fourth revolution of the roller, thus applying adhesive to every fourth double page section. Should it be desired to apply adhesive every second section, the two-protuberance transfer rotor is replaced with a rotor having four protuberances. For straight printing an eight-protuberance rotor would be used, applying adhesive twice every revolution of the applicator.

While it is apparent that other gear ratios and numbers of protuberance may be used, the above described arrangement illustrates how the transfer rotor **27** may be operated at a fraction of the speed of the applicator roller. Furthermore the effective diameter of the rotor protuberances may be reduced to the point that the protuberances have no tendency to throw adhesive. The dipping roll being further reduced in rotational speed also has no tendency to throw adhesive.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. In a high-speed press, apparatus for applying adhesive to a web moving at press speed comprising an applicator roller rotating at press speed in contact with the web, said roller having a small well in its periphery, said well being of size to hold a drop of adhesive by molecular force against the centrifugal force of the roller, a transfer device for applying adhesive to said roller, means to supply adhesive to the transfer device, said transfer device comprising a rotor and an adhesive-carrying protuberance on the rotor with an effective radius substantially less than that of the roller, means for driving the roll at the same speed as the web and speed reducing means interconnecting said roller and rotor to drive the rotor at a slower speed than the roller and to synchronize movement of said protuberance and well so that said protuberance wipes a drop of adhesive onto the roller in the opposite direction of motion of the well to fill the well and remove excess adhesive from the periphery of the roller, whereby splattering of adhesive from said transfer device and applicator roller is prevented.

2. Apparatus according to claim 1 characterized in that said adhesive carrying protuberance has a resilient tip portion which removes excess adhesive from the periphery of the applicator roller by squeegee action.

3. Apparatus according to claim 1 characterized in that said adhesive supply means comprises a reservoir of adhesive, and a roll dipping in said reservoir to pick up a peripheral film of adhesive, said speed reducing means driving the pickup roll at a linear speed substantially slower than that of the transfer protuberance.

4. Apparatus according to claim 1 characterized in that said applicator roller carries a plurality of wells and said transfer rotor carries at least one protuberance for each well.

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No references cited.