April 20, 1937. G. SMITH 2,077,535

MEANS FOR APPLYING ADHESIVE TO MATERIALS FOR COATING SURFACES OR IN THE MANUFACTURE OF COATED OR COMPOUND MATERIALS

Filed June 13, 1935 2 Sheets-Sheet 1

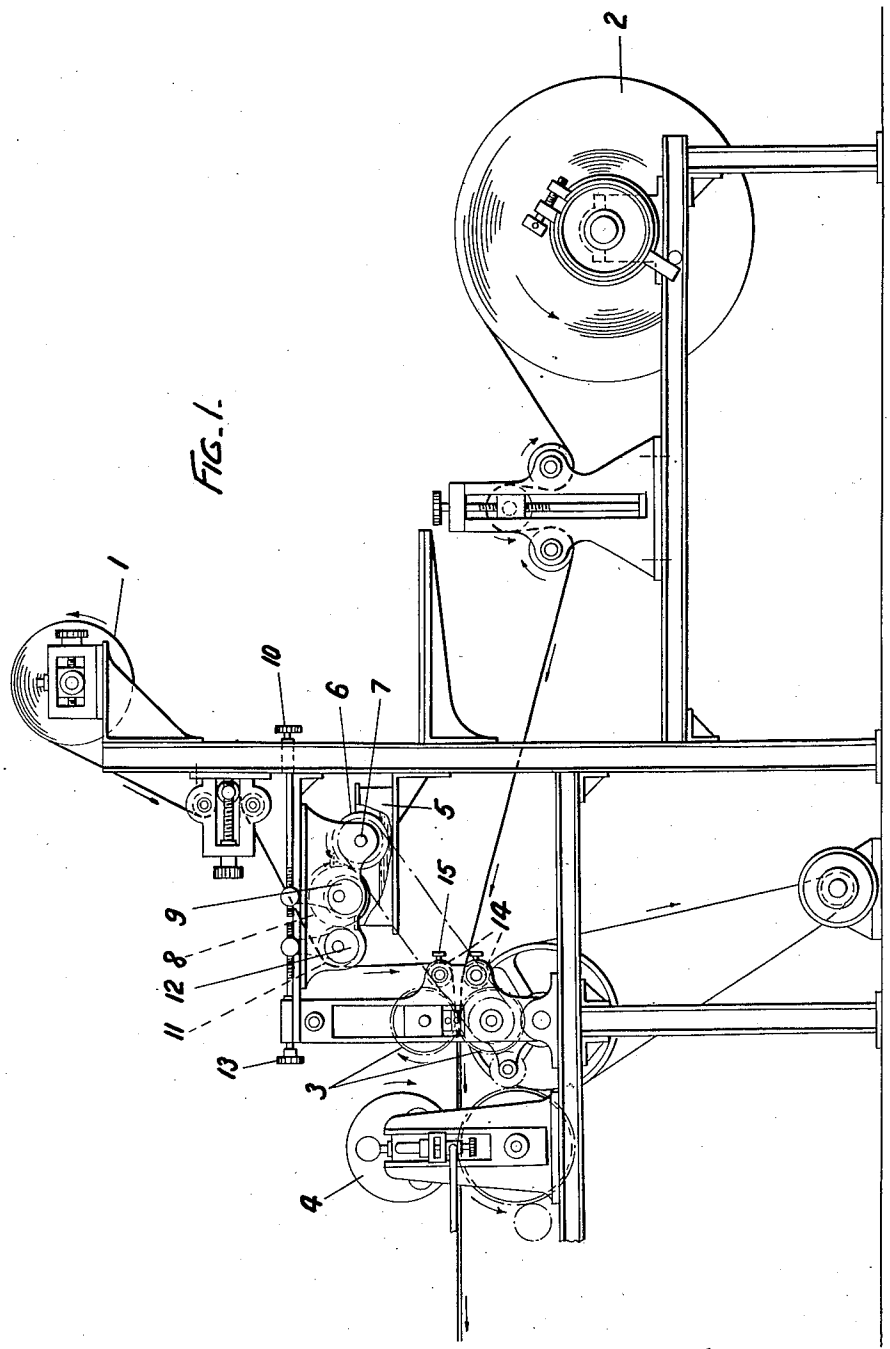


FIG. 1.

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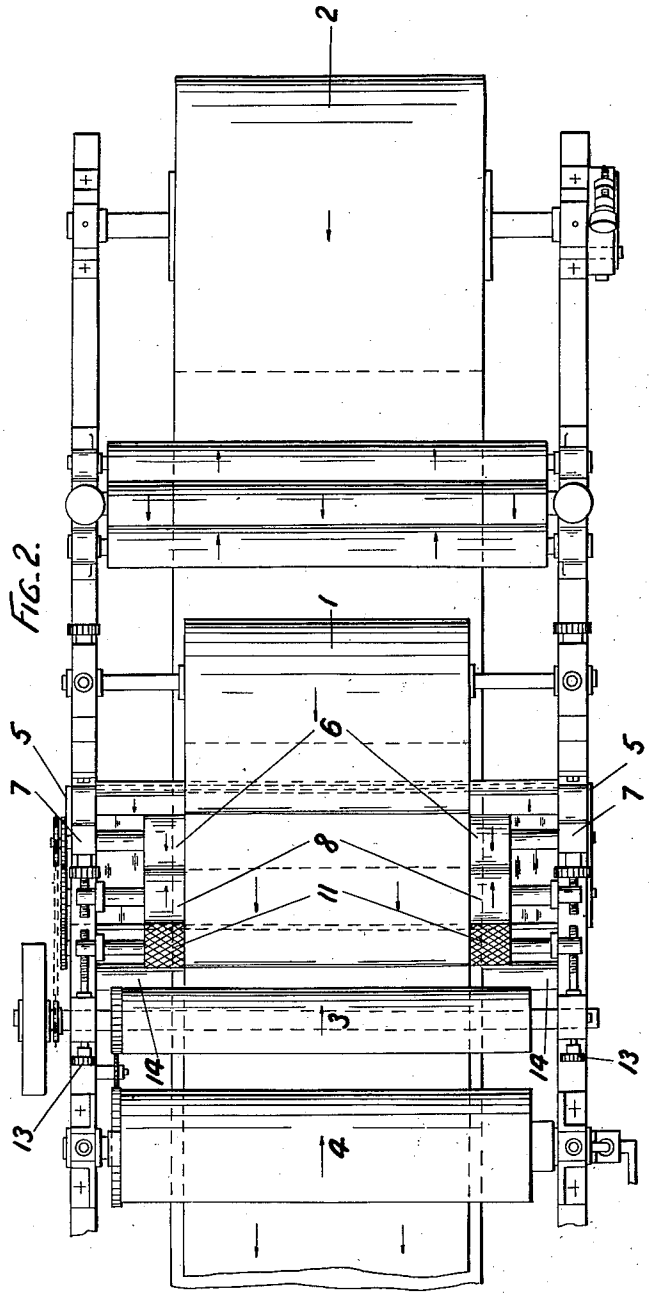


FIG. 2.

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UNITED STATES PATENT OFFICE

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MEANS FOR APPLYING ADHESIVE TO MATERIALS FOR COATING SURFACES OR IN THE MANUFACTURE OF COATED OR COMPOUND MATERIALS

Gabriel Smith, Leyton, England

Application June 13, 1935, Serial No. 26,464
In Great Britain November 2, 1934

7 Claims. (Cl. 154—35)

In the specification of my Patent No. 2,037,398 dated April 14, 1936, there is described a compound material obtained by coating sheet material with a transparent or translucent film or foil with the aid of continuous intersecting fine lines of adhesive spaced relatively far apart considering the thickness of the lines.

The application of such lines of adhesive, which in many instances are almost hairlike, is effected not without difficulty, especially in dealing with the specific manufacture of lined material to be supplied in bulk to users, where rapidity of output is essential or desirable.

The object of the present invention is to enable adhesive to be applied in the manner referred to, continuously in a reliable manner, as material is unwound from a reel, making use of an improved machine of the kind in which adhesive is picked up from a container by a mechanically rotated roller.

A machine according to the invention is characterized by an arrangement comprising the combination with at least one pair of superposed pressing rolls, of a reel support for a web of transparent material at a higher level than the pressing rolls, a trough for adhesive at an intermediate level, a pick-up roller in the trough, a patterned roller adapted to apply adhesive directly to the underside of the said web or indirectly through a transfer roller, and a roller coated with a thin film of adhesive by the pick-up roller and adapted to coat the patterned roller with a still thinner film of the adhesive. The arrangement permits the use of feed rolls which can be as readily supplied with base material in the form of separate sheets as with continuous strip or sheet material, which is preferred.

When base material in the form of a continuous strip is to be dealt with, a reel support for the latter is employed, situated so that the two materials converge toward the pressing rolls from the same end of the machine, the adhesive applying means or element combination being located between the materials. The two materials enter the feed rollers togther from the same side or end of the machine, the coated material being above the uncoated material with its coated face undermost, it being arranged that on account of the fine character of the applied adhesive lines and the quick drying character of the adhesive itself, the time taken to reach the pressing rolls will be very brief and only long enough to ensure that the coated material is freed of all wrinkles.

The accompanying drawings illustrate the invention, Fig. 1 being a side elevation and Fig. 2 a plan.

As here shown, 1 is a reel of transparent cellulosic film material, 2 is a reel of paper or card-board, 3 are rubber-covered pressing and first feed rolls and 4 are following gas-heated calender and second feed rolls. In conjunction with these, 5 is the trough for adhesive; 6 is a steel adhesive pick-up roller mounted in the trough within stationary bearings 7; and 8 is a plain steel roller mounted in eccentric bearings 9 so that it can be adjusted minutely by screws 10 in relation to the roller 6 in order to transfer a film of adhesive of any desired thickness from said roller 6 to the roller 8. Cooperative with these rollers is a patterned roller 11 of steel, upon which the transparent film drawn from the roll 1 bears, and which itself bears against the film of adhesive on the aforesaid roller 8, this said roller 11 being, similarly to the roll 8, mounted in eccentric bearings 12 which are adjustable by screws 13, in order to apply thereto a properly thin film of the adhesive equal to approximately one-half the thickness of that applied upon the roller 8. The clearance between the respective rollers 6, 8 and 11, rotated mechanically and shown geared together (see Fig. 2) for positive drive, is of the order of a thousandth of an inch. It will be observed that the same, as a group, are disposed only a short distance above the press and first feed rolls 3 therebelow, the patterned roller being the nearest and disposed somewhat laterally but almost directly over said rolls, the purpose being to have them arranged closely enough to permit the coated transparent material to be contacted or joined with the uncoated card-board or backing material as soon as possible after the adhesive application thereto, ensuring only that the coated material is entirely smooth and free of all wrinkles or buckling. The short distance between them is also desired and is great enough to expose the coated surface of the transparent material to view for the watchful inspection required to be given to the same before it is joined with the uncoated backing sheet.

Adjacent to the aforesaid press and first feed rolls 3 below the above described series of rollers, are virtually opposed closely spaced rubber-covered guide rollers 14 for the film and card-board or paper sheets, so as to train or direct them for immediate meeting or pressing together between said feed rolls as soon as possible after application of the adhesive, a frictional drag, which is adjustable in degree, being given to these guide rollers by any suitable brake means, represented

by the tightening screws 15, so as to ensure that the uniting sheets and especially the coated film material are wholly smooth and free of wrinkles or bucklings.

No claim is here made to details such as braking, tensioning and adjusting devices per se, inasmuch as such do not individually or in combination constitute any part of the invention and are moreover to be found in many existing machines.

As will be evident, any suitable means may easily be fitted to the machine to enable separate sheets to be dealt with when so desired instead of the continuous sheets shown.

What I claim is:—

1. A machine of the class described, comprising, in combination, a feed reel for a web of base sheet material and a feed reel for a web of transparent sheet material supported at different levels the second above the first, a pair of individually superposed pressing rolls arranged intermediate the levels of the two reels between which the webs from the same are drawn and compressed together, a trough for adhesive disposed between the pressing rolls and the transparent web reel at a level relatively close to the former, a pick-up roller in the trough, a patterned roller adapted to apply a film of adhesive from the pick-up roller to the inner side of the transparent web trained free thereover in passage to the pressing rolls, said patterned roller being disposed laterally above and only a short distance from said pressing rolls and said transparent web being thereafter guided substantially direct into the bite of said rolls so as to be promptly but with proper assurance of smoothness contacted with the base sheet web after receiving the adhesive film coating, and a transfer roller between said pick-up and patterned rollers imparting a thin film coating of adhesive from the former to the latter of a degree less than it itself receives from said former; said pick-up, patterned and transfer rollers being mechanically rotated together.

2. A machine according to claim 1, wherein the pick-up, transfer and patterned rollers are geared together for direct interrelated drive.

3. A machine according to claim 1, wherein the patterned and transfer rollers are mounted in eccentric bearings adapted to adjustment for the regulation of clearances therebetween.

4. A machine according to claim 1, wherein the pick-up, transfer and patterned rollers are geared together and said transfer and patterned rollers are mounted in eccentric adjustable bearings permitting the regulation of their clearance from each other.

5. A machine according to claim 1, wherein the transfer roller receives a thin coating of adhesive from the pick-up roller and in turn transmits a still thinner film of the adhesive to the patterned roller.

6. A machine of the class described, comprising in combination with at least one pair of superposed pressing rolls, a feed reel for a web of transparent sheet material supported above the pressing roll level and a feed reel for a web of base sheet material supported below the pressing roll level, both of said reels expending to said pressing rolls between which the sheets are drawn and pressed together, a trough for adhesive at an intermediate level between said transparent web reel and the pressing rolls, a pick-up roller in the trough, a patterned roller adapted either directly or indirectly through a transfer roller to apply a film of adhesive from the pick-up roller to the under side of the transparent web trained thereover from its reel to the pressing rolls, and an intermediate roller between the pick-up and patterned rollers transferring a reduced coating film of adhesive from the former to the latter; said three rollers being geared together and rotated mechanically and said patterned roller being disposed substantially directly above and only a short distance from said pressing rolls so that the web after receiving the coating therefrom can be guided direct into the bite of said rolls with a minimum of distance travel and a minimum of time lapse.

7. A machine of the class described, comprising, in combination, a supported feed reel for a web of transparent sheet material, a supported feed reel for a web of base sheet material below the level of the former, a pair of superposed pressing rolls arranged intermediate the levels of the two reels and between which the webs from said reels are drawn and pressed together, a trough for adhesive disposed between the pressing rolls and the transparent web reel relatively proximate to the former, a pick-up roller in the trough, a patterned roller adapted to apply a film of adhesive from the pick-up roller to the inner side of the transparent web which is trained free thereover in passage to the pressing rolls, said patterned roller being disposed laterally above and only a short distance from said pressing rolls and said transparent web being thereafter guided direct into the bite of said rolls so as to contact the same with the base sheet web substantially immediately after receiving the film of adhesive, and a transfer roller between the pick-up and patterned rollers serving to impart a film coating of adhesive from the former to the latter in a substantially reduced amount; said pick-up, transfer and patterned rollers being geared together and mechanically rotated through one of the same and said transfer and patterned rollers being mounted in eccentric adjustable bearings adapted to permit adjustment of their clearance from each other.

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