April 15, 1941. H. E. HALLMAN 2,238,695

APPARATUS FOR APPLYING ADHESIVE TO WAX COATED PAPER

Filed Aug. 27, 1938 2 Sheets-Sheet 1

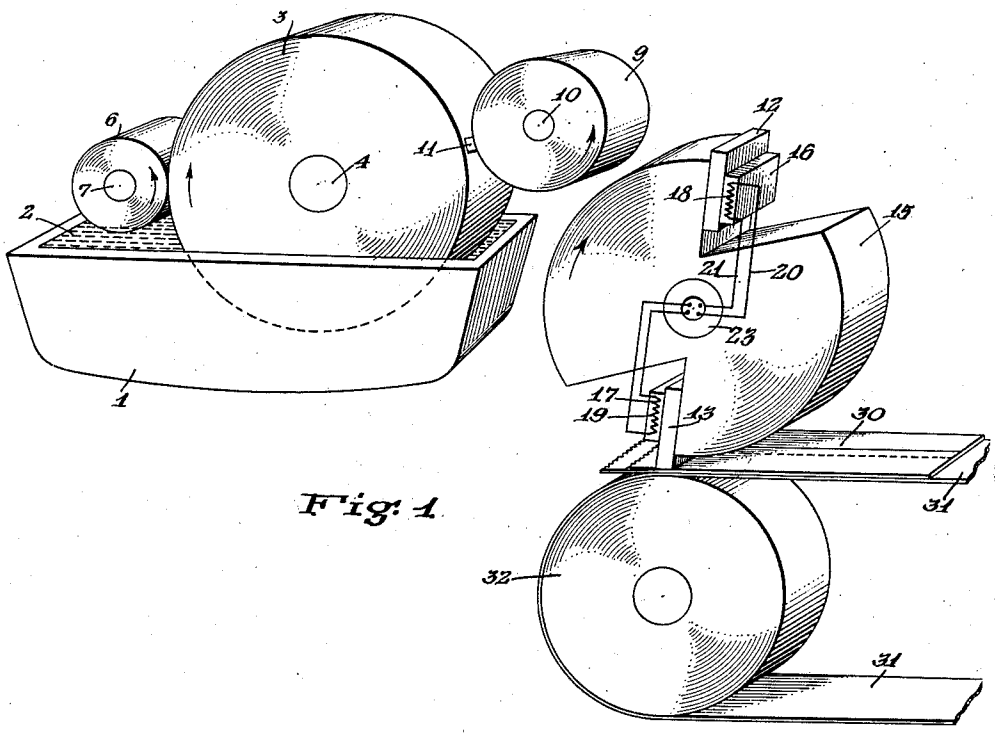


Fig. 1

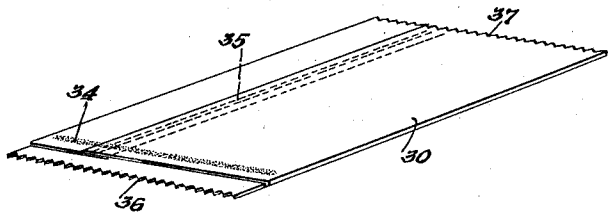


Fig. 2

INVENTOR.
Harold E. Hallman
BY Ostrolenk, Faber & Gerb
ATTORNEYS

April 15, 1941. H. E. HALLMAN 2,238,695

APPARATUS FOR APPLYING ADHESIVE TO WAX COATED PAPER

Filed Aug. 27, 1938 2 Sheets-Sheet 2

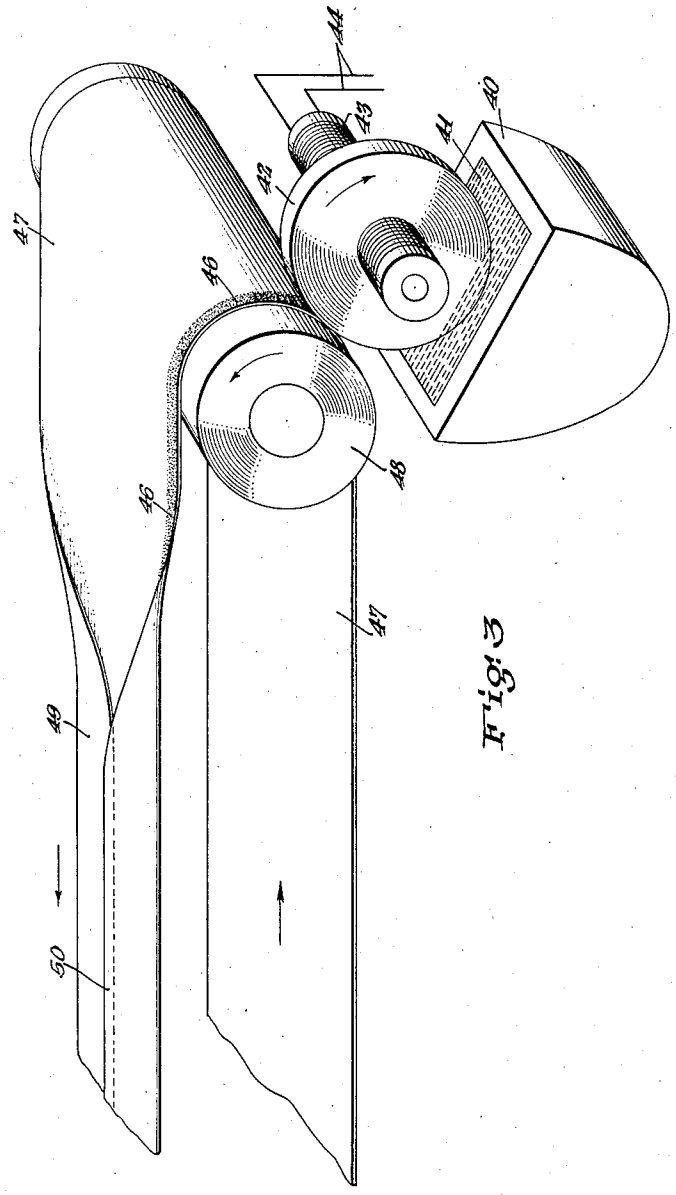


Fig. 3

INVENTOR.
Harold E. Hallman

BY

Ostrolenk, Greene & Marsen
his ATTORNEYS

Patented Apr. 15, 1941 2,238,695

UNITED STATES PATENT OFFICE

2,238,695

APPARATUS FOR APPLYING ADHESIVE TO WAX COATED PAPER

Harold E. Hallman, Catonsville, Md.

Application August 27, 1938, Serial No. 227,115

8 Claims. (Cl. 91—50)

My invention relates to a novel apparatus for applying glue to a bag bottom and more specifically my invention relates to an apparatus for receiving and heating glue containing a volatile solvent and applying said glue containing said volatile solvent to a wax coated paper.

In the prior art there has been much difficulty in sealing wax coated paper inasmuch as the ordinary glue applied thereto fails to secure a real grip upon the wax coated paper inasmuch as the wax is resistant to penetration. It has been suggested that glue containing a solvent be employed so that the solvent contained therein could strike through the wax to allow the glue to contact the paper beneath the wax and it is preferable in such instances that the solvent be heated to obtain the proper action. However, if the glue and solvent mix be heated in the glue pot, the solvent which is customarily volatile is driven off and its action lost.

My apparatus is effective when an adhesive mix comprising glue and volatile solvent is employed and also when an adhesive mix comprising glue or adhesive without volatile solvent is employed. The advantages of not heating for an extended period are applicable even when no volatile solvent is used.

Accordingly, I have devised a novel apparatus by means of which the glue and solvent mixture can be applied in a hot state without the loss of the important volatile solvent so that the optimum action of the glue is obtained. My apparatus further provides for the economical and accurately predetermined delivery of proper amounts of glue and solvent mixture to the wax paper.

My apparatus comprises a drum which revolves in a glue pot which contains the glue and volatile solvent mix which shall be termed adhesive mix hereinafter. The adhesive mix is carried up on the revolving drum and a doctor roll gauges the amount of adhesive mix that is carried by the roll. Placed adjacent to the adhesive roll and adapted to contact it after the adhesive mix has been engaged by the doctor roll is another roll carrying a segment which segment contacts the drum and receives an application of the adhesive mix. Positioned adjacent to this roll carrying the segment and adapted to cooperate therewith is a further roll having a cutout section which carries a paste bar adjacent to which is a heating element.

The roll carrying the segment and the roll carrying the paste bar are timed to cooperate so that the segment on the first roll contacts the one or more paste bars on the applicator roll. The applicator roll revolves in timed relation with bag sections passing beneath the roll so that the applicator roll applies a line of adhesive mix to the bag section whereupon the end of the bag section is turned up upon the adhesive line to form the bag bottom.

An added advantage of my apparatus lies in the fact that the heated paste bars act not only to heat the volatile solvent and adhesive mix but also at the same time that the paste bars apply the heated adhesive mix to the wax coated paper, the heating action of the heated paste bar on the wax coating of the paper tends to melt the wax coating to allow the penetration of the adhesive mix through the fibres of the paper beneath the wax coating. Thus I obtain a dual beneficial action by the use of the heated paste bars, said heated paste bars, as stated, acting both to heat the adhesive mix which is applied to the wax coated paper and also acting to heat the wax coating to cause the same desirably to melt to allow the penetration of the adhesive through to the paper.

In addition to applying transverse stripes of paste to form the bag bottom, I provide an apparatus comprising a heated disc which applies paste longitudinally along the paper to provide the longitudinal body seam of the bag to be formed. By employing a heated disc for applying the adhesive and volatile solvent mix, I again obtain manifold advantages. First, the heated disc heats the volatile solvent and adhesive mixture so that it is applied hot to the wax coated paper and secondly, the heated disc acts to heat the wax coating of the paper causing it to melt to allow the penetration of the applied adhesive and solvent.

I further propose employing wax coated paper having a thicker inside wax coating and a thinner outside wax coating. That is, the wax coating on the interior of the bag is thicker than that on the exterior of the bag. This is an advantage in the final product since it is desirable that the contents of the bag, which may be greasy, be prevented from striking through to the fibres of the paper and impairing the paper. The wax coating on the outside of the bag, though thinner than the inside wax coating, is sufficiently thick to perform its function of rendering the bag substantially moisture proof. By employing the respectively thicker and thinner coatings of wax, I also provide for more efficiently joining the wax coated paper in the formation of the bottom of the bag and also

in the longitudinal formation of the body seam. Thus, by means of my particular apparatus set forth, I take care to apply the adhesive mix by means of a heated member as for example a paste bar or heated disc respectively with respect to the bottom of the bag and body seam of the bag so that the heated member applies the adhesive to that side of the wax coated paper having the thicker wax coating. Thus, when the heated disc applies the hot adhesive and volatile solvent mixture to the thicker wax coating, the dual action of the hot adhesive and the heated disc facilitate the penetration of the adhesive through the relatively thicker wax coating to the paper. Then when the thinner coating of wax coated paper is folded over upon the deposited adhesive, the residual heat of the adhesive and such heat as is left from the applying member is sufficient to cause the adhesive to strike through the thinner wax coating to the paper to secure a perfect joint. The coordination of the use of a relatively thicker coating of wax on one side of the paper and a relatively thinner coating on the other, and the application of the heated adhesive mix to the thicker coating by means of a heated applicator member makes possible the formation of a strong and secure joint wherein the adhesive has struck through the wax coatings to the fibres of the paper.

Accordingly, it is an object of my invention to provide a novel apparatus for applying a heated mix of glue and solvent to paper.

It is a further object of my invention to provide a novel apparatus that picks up a glue and volatile solvent mix in an unheated state and applies it to wax coated paper in a hot state without loss of volatile solvent.

It is still a further object of my invention to provide a novel apparatus comprising a roll positioned to revolve in a bath of adhesive mix, a doctor for the roll, a roll carrying a segment adapted to pick up the adhesive mix on the segment, an applicator roll carrying segments with adjacent heater means, the applicator segments being supplied with adhesive mix by the segments of the adjacent roll, the applicator segments being adapted to heat the adhesive mix and apply it to the wax paper.

Other objects of my invention will become apparent from the description which follows taken in connection with the drawings in which,

Figure 1 is a perspective of the apparatus of my invention.

Figure 2 is a perspective of a bag showing the position of the applied glue and solvent mix.

Figure 3 is a perspective of a heated disc means for applying the glue and solvent mix to form the longitudinal seam.

More specifically, in Figure 1 is a glue pot 1 which contains an adhesive mix 2 comprising glue and a volatile solvent such as alcohol, ether, acetone, or similar low boiling point volatile solvent. Immersed in the adhesive mix and adapted to rotate therein is a glue pot roll 3 which rotates on the shaft 4 in the direction indicated by the arrow. Positioned adjacent to the glue pot roll 3 is a doctor roll 6 which rotates on a shaft 7 and may be adjustably positioned with respect to the glue pot roll 3 so as to measure the amount of adhesive mix carried up upon the roll 3. Positioned adjacent the glue pot roll 3 is a further segment roll 9 rotating on a shaft 10 and carrying a paste segment 11. The paste segment 11 is adapted to contact the glue pot roll 3 and pick the adhesive mix therefrom. The paste segment 11 is adapted to contact the paste bars 12 and 13 and transmit the paste thereto. The paste bars 12 and 13 are set in an applicator roll 15 and are heated by the adjacently mounted strip heaters 16 and 17. The strip heaters 16 and 17 are heated by means of the electrical coils 18 and 19 which are supplied through the conduits 20 and 21. A conventional commutator and brush arrangement secured on the end of the shaft 23 supplies the electricity to effect the heating of the strip heaters 16 and 17. The paste bars 12 and 13, as exemplified by the position of paste bar 13, applies the adhesive mix to the proper portion of the bag 30 which travels on the belt 31, which belt 31 moves about the drum 32. The paste bars apply the adhesive mix in the form of a paste line 34 on the bag 30. The overlap of the longitudinal seam is indicated at 35; the serrated edges 36 and 37 are formed by the cutting mechanism that severs the tube of wax coated paper into proper lengths. Although it forms no part of the present invention, it is to be noted that the bag bottom is formed by folding over the end 36 on the glue line 34.

In Figure 3 I show means for applying the heated adhesive and solvent to the edge of wax coated paper to form a longitudinal seam. In the pot 40 is the adhesive and volatile solvent mix 41. A disc 42 revolves in the adhesive and volatile solvent mix and carries the mix up upon its periphery. The disc 42 is heated by a cartridge heater 43 which receives a source of current through the wires 44. The revolving heated disc 42 applies a line of adhesive 46 to the wax coated paper 47 which moves about the roll 48. As the wax coated paper 47 travels after being given a layer of adhesive and solvent 46, it is folded over a conventional former (not shown) to form the tubular section 49 with the seam 50.

Preferably the wax coating on that side of the paper where the adhesive mix is applied is thicker than the wax coating on the opposite side of the paper. Thus, the heated adhesive is applied by the heated disc to the thicker wax coating and strikes through such thicker coating to the fibres of the paper. Shortly after that portion of the wax coated paper with the heated adhesive applied thereto is folded over on the matching fold to form the longitudinal seam. Preferably the external coating of the paper is thinner and thus the heated adhesive strikes through this thinner coating to secure itself to the fibres of the paper, whereby a strong seam in which the adhesive is secured to the paper itself on both sides is obtained.

The operation of my apparatus is as follows:

A suitable adhesive mix comprising glue or paste in combination with a volatile solvent as has been described above is mixed thoroughly and placed in the pot 1. This adhesive mix is of such a nature that I have found it extremely effective when applied hot to the wax coated paper. It is best in the heated state because the adhesive mix acts to dissolve the wax coating of the paper both by reason of its heating and also because of the solvent action of the contained solvent. Dissolving the wax, it strikes through to the paper beneath the wax and thus secures a strong grip to effect a good bottom seal. Without this striking through action, the glue would have an imperfect bond to the wax.

However, the adhesive mix cannot be heated in the pot since it would merely tend to thicken the glue driving off the volatile solvent, and for this reason it is best heated at that point when

it is about to be applied to the wax coated paper.

Accordingly, the adhesive mix comprising glue and solvent in the pot is simultaneously mixed and carried up on the roll 3. The doctor roll 6 by proper adjustment of its distance from the glue roll 3 determines the thickness of the layer of adhesive mix carried by the roll 3. Thus after the adhesive mix has passed the doctor roll 6 it is at a predetermined level on the glue roll. The glue on the roll 3 is picked up by the segment 11 mounted on the roll 9, and because of the timed relation of the roll 9 and 15, the segment roll 9 applies the adhesive mix to the paste bar 12; then applying a fresh portion of the adhesive mix to the paste bar 13. The paste bars 12 and 13 are maintained in a heated state by means of the adjacently mounted strip heaters 16 and 17.

The adhesive mix is on the paste bar sufficiently long to be heated without being heated so that any quantity of the volatile solvent is lost by evaporation. The paste bars are timed with the movement of the bag segments 30 which move along the belt 31 so that the paste bar applies paste on to the bag segments on the predetermined paste line 34, whereupon the hot adhesive mix acts to melt the wax and with the aid of the volatile solvent strikes through to the fibers of the paper, so that when the end of the paper segment is folded over a good bond is secured.

Various modifications of this process and apparatus are within the scope of my invention. The applicator roll may have one or more paste bars and the segment roll may have as many segments as is feasible, depending upon the size of the roll and its correlated speed with the applicator roll.

Although I have shown this particular device as particularly applicable for laying a transverse glue line, it may be employed to apply glue in any desired form.

Attention is directed to the fact that in the apparatus described in the present invention, the heating means is in a protected position in the recessed or guarded portion of the drum 15. Thus during the rotation of the drum, the strip heater 16 is substantially protected from the chilling effect of air currents because of its particular position as shown. Inasmuch as it is desired to maintain the paste bar at a relatively high temperature and to maintain this high temperature uniform, the protected position of the strip heater is important.

If in the formation of bag bottoms as shown in Figures 1 and 2 of my drawings a wax coated paper is employed in which the inside coating is thicker than the outer coating and it is desired to obtain the superior bond described hereinbefore, then I may apply the line of hot adhesive 34 to the bottom flap 36, whereby the heated adhesive is thus applied to the thicker inner coating of the wax paper by the heated paste bar and is then folded over, whereupon the outer thinner wax coating of the paper is melted and the adhesive strikes through the outer thinner coating to effect a bond between the paper of both components of the fold. Although in Figures 1 and 2 I have shown the adhesive mix being applied to the outer coating, I may, if I employ the thicker inner coating and thinner outer coating described hereinbefore, apply the heated adhesive to the inner coating of the flap 36 instead of to the outer coating as shown in Figures 1 and 2.

Although I specifically refer throughout this specification to wax coated paper I include within the scope of my invention paper or any other sheet material as for example, non-fibrous Cellophane, as the paper material and any heat sensitive material which has characteristics corresponding to wax as the coating material. Thus I have set forth wax and paper by way of example only and I intend that this should be understood to mean materials that have equivalent functions in this art. The appended claims should be read in that light.

I claim:

1. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, means for withdrawing the mix from the tank, a paste bar, means for heating the paste bar, means for applying said mix to said paste bar.

2. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and to carry up the adhesive mix on its surface, a paste bar, a travelling segment adapted to contact said first mentioned roll and carry the adhesive therefrom to a paste bar, and means for heating said paste bar.

3. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and to carry up the adhesive mix on its surface, a doctor adjacent said roll, a travelling segment positioned on a secured roll adapted to contact said first mentioned roll and carry the adhesive therefrom, a paste bar travelling in such a path as to periodically contact said travelling segment, said paste bar being rotated about a given point and means for heating said paste bar.

4. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and to carry up the adhesive mix on its surface, a doctor roll spaced from but adjacent to said roll, a travelling segment positioned on a secured roll, said travelling segment moving so as to contact said first roll and secure the mix of volatile solvent and adhesive therefrom, a paste bar travelling in such a path as to periodically contact said travelling segment, said paste bar being rotated about a given point and heating means mounted adjacent to said paste bar.

5. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and carry up the adhesive mix on its surface, a doctor roll spaced from but adjacent to said roll, a travelling segment positioned on a secured roll, said travelling segment moving so as to contact said first roll and secure the mix of volatile solvent and adhesive therefrom, paste bars travelling in such a path as to periodically contact said travelling segment, said paste bars being rotated about a given point and means for heating said paste bars.

6. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated

paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and carry up the adhesive mix on its surface, a doctor roll spaced from but adjacent to said roll, a travelling segment positioned on a secured roll, said travelling segment moving so as to contact said first roll and secure the mix of volatile solvent and adhesive therefrom, paste bars travelling in such a path as to periodically contact said travelling segment, said paste bars being rotated about a given point, strip heaters mounted adjacent to said paste bars.

7. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises a tank adapted to contain a mix of volatile solvent and an adhesive, a roll positioned to be partially submerged in the mix of volatile solvent and adhesive and carry up the adhesive mix on its surface, a doctor adjacent said roll, a travelling segment adapted to contact said first mentioned roll and carry the adhesive therefrom, a drum having a cutaway sector, a paste bar secured within the cutaway sector of said drum, means for heating said paste bar positioned within said sector.

8. An apparatus for applying a mix comprising a volatile solvent and an adhesive to coated paper which comprises, a drum having a cutaway sector, a paste bar secured within the cutaway sector of said drum, means for heating said paste bar positioned within said sector.

HAROLD E. HALLMAN.