

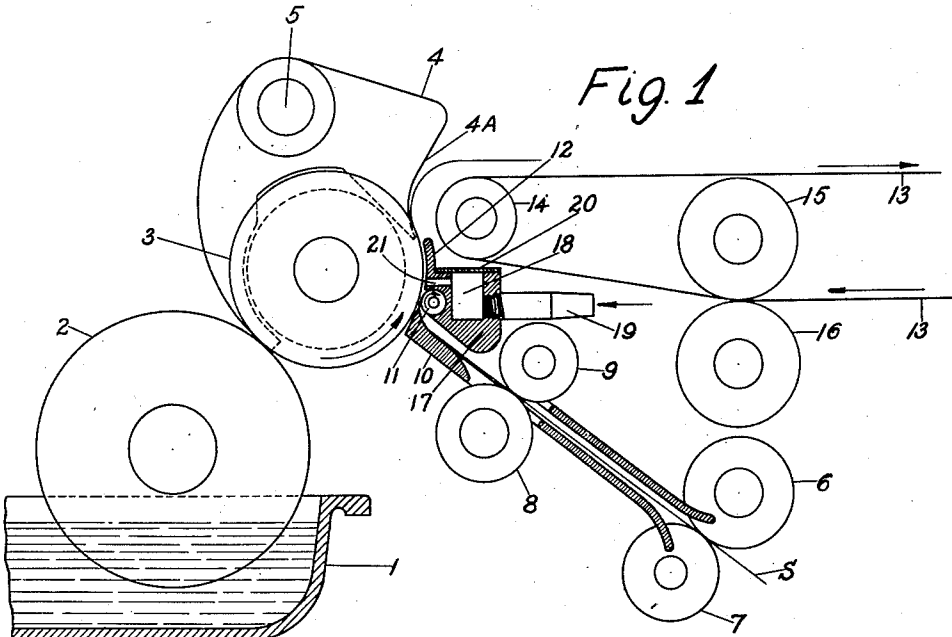
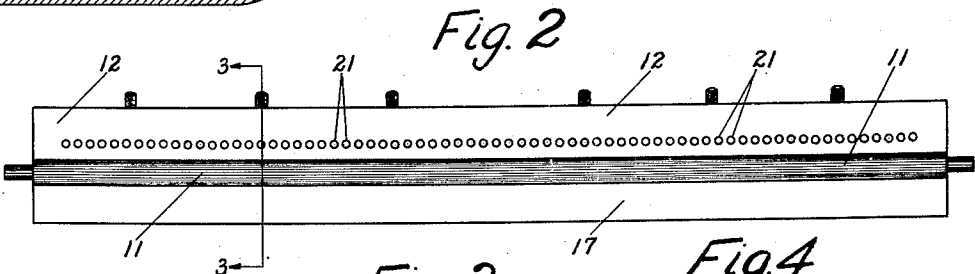
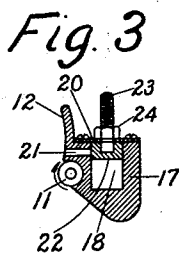
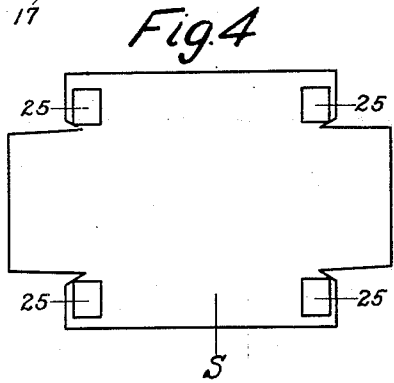
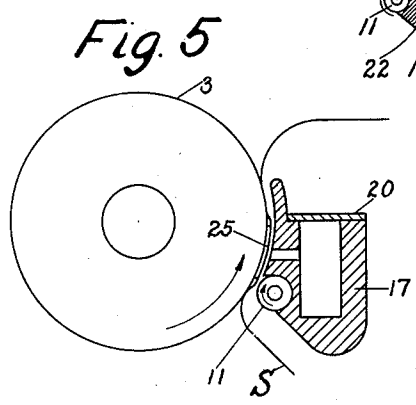
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COATING APPARATUS

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COATING APPARATUS

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My invention relates to apparatus for applying to sheets, of paper or other materials, a coating of any suitable material, as adhesive wax, etc.

In accordance with my invention, the coating material is disposed or carried upon a surface, as that of a roll. The sheet is brought into contact with the surface for receiving therefrom the coating material, and to improve the effectiveness of the coating operation there is exerted upon the sheet preferably directly, fluid pressure.

Further in accordance with my invention, there is disposed adjacent the coating-carrying surface and beyond the region of application of the fluid pressure a guide surface to maintain prolonged contact of the sheet with the coating surface.

Further in accordance with my invention, the extent of outlet area of the fluid passage or passages is variable or adjustable to suit particular circumstances, and the outlet or outlets of the fluid passage or passages may be localized with respect to suitable portions of a sheet.

Further in accordance with my invention, sheets whose coating-receiving surfaces are not plane or flat, as in the case of embossed sheets or sheets having local reinforcements on the surface thereof, as by tabs, may have applied thereto a coating material by structure of the character referred to, the fluid pressure serving to cause the coating material to be applied to the raised portions of the surfaces and to closely adjacent areas, or to the reinforcing elements or tabs and to those portions of the sheet lying close to them.

My invention resides in a method and apparatus of the character hereinafter described and claimed.

For an understanding of my method and for an illustration of one of the various forms my structure may take, reference is to be had to the accompanying drawing, in which:

Fig. 1 is a side elevational view, partly in vertical section, of apparatus embodying my invention.

Fig. 2 is a front elevational view of the fluid-pressure-applying means and an associated roller.

Fig. 3 is a cross sectional view on the line 3-3 of Fig. 2.

Fig. 4 is a plan view of a sheet provided with reinforcing elements or tabs.

Fig. 5 is a side elevational view, partly in section, illustrating the sheet and its reinforcement in coating-receiving position.

Referring to the drawing, 1 is a receptacle or pan in which is disposed the fluid coating material, as glue, melted paraffine, etc. The rotating roll 2 is partly immersed in the material in the pan 1, and delivers to the coating roll 3 coating material from the receptacle 1. In grooves disposed longitudinally of the roll 3 are disposed stationary stripper members 4, carried upon a suitable support, as bar 5.

The sheet S is fed by the feed rollers 6 and 7 to the feed rollers 8 and 9, which pass the sheet onwardly over the guide plate 10 between the idler guide roller 11 and the coating roll 3. The sheet continues its movement upwardly through the narrow space between the guide roller 3 and the arcuate guide plate 12, whereupon it is deflected by the front edges 4^a of the stripper members 4 on to the conveyer belt 13, which travels over the idler roller 14 and is driven by the rolls 15 and 16.

The idler roller 11 has bearings in the transversely extending air blast bar 17, integral with or secured to which is the aforesaid plate 12.

Extending longitudinally of the bar 17 is the passage 18, with which communicates the pipe 19, through which is delivered any suitable fluid under pressure, for example, air. The passage 18 is closed at its top by the plate 20. Communicating with the passage 18 is any suitable number of fluid-outlet passages 21, of any suitable size or shape, through which the fluid under pressure is discharged against the rear face of the sheet S, holding it snugly against the coating surface or roll 3, from which it receives upon its front face the adhesive or other coating material from the coating surface of the roll 3.

Fluid pressure so applied effects intimate contact between the sheet and the roll 3, with resultant improvement in distribution of the coating material upon the sheet and its inti-

mate adherence to the sheet. The sheet, after passing the fluid outlets, is still confined adjacent the roll 3 for a substantial distance by the arcuate plate 12 further to ensure completeness of application of coating material to the sheet, particularly in case sheets are of a material thickness or formation causing them to curl, buckle or otherwise deform.

Suitably to vary or determine the number of outlet passages 21 to be utilized, or to vary or determine the effective length transversely of the total outlet area of the fluid-delivery passage or passages, there are provided insert bars or blocks 22, Fig. 3, extending into the passage 18 to an extent sufficient to cover the outlet passage or passages 21, in effect blocking them off. The members 22 are provided with screw-threaded studs 23 receiving the nuts 24, whereby the members 22 are held in position to the cover plate 20.

The method and apparatus above described are suitable for applying coating material not only to plain or simple sheets, but also to those provided locally with reinforcing elements or tabs 25, Fig. 4. In the example illustrated the sheet S may be a wrapper or cover to be adhesively applied to a box by a box-wrapping machine, and the reinforcing tabs 25 are applied at those portions of the sheet where they are lapped around the corners of the box.

For coating reinforced sheets, the same apparatus and method are utilizable, and the fluid pressure as applied by the fluid discharge from the passage or passages 21 may be locally applied adjacent the reinforcing elements or tabs 25, thereby causing intimate contact between the tabs or reinforcing elements and the coating roll 3 and further causing close approach to the roll 3 of those portions of the sheet S immediately adjacent the elements or tabs 25, whereby there is not left uncoated substantial areas of the sheet S immediately surrounding the reinforcing elements or tabs.

In Fig. 5 a sheet S, reinforced by elements 25, is shown in position in which the reinforcing element is forced into intimate contact with the roll 3 by the fluid pressure as well as the immediately adjacent portions of the sheet S, whereby both the reinforcing element and the adjacent portions of the sheet are effectively coated.

The peripheral speed of the feed rollers 8 and 9 is somewhat less than the peripheral speed of the roller 3, whereby, until the sheet passes beyond the rollers 8 and 9, there is relative movement of the roller 3 with respect to the sheet, and the reinforcing elements thereof, if supplied therewith, effecting a brushing or wiping action resulting in more intimate application of the glue or other coating material to the sheet. Accordingly, in addition to the aforesaid wiping action there is applied the aforesaid fluid pressure procuring in combination with the wiping action a substantial-

ly perfect application of glue or coating to the sheet.

For brevity in the appended claims, the term "air" includes air and any equivalent fluid.

What I claim is:

1. In the art of applying coating material to sheets, the method which comprises feeding a sheet into adhering relation with a surface bearing coating material, and thereafter moving the surface to bring the adhering sheet into a region where air under pressure is applied to the back of the sheet to force it into intimate contact with said surface.

2. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting contact between a raised portion of a sheet and a surface bearing coating material, and applying air under pressure directly to the back of the sheet to an area thereof contiguous to said raised portion.

3. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting contact between a raised portion of a sheet and a surface bearing coating material, and applying air under pressure directly to the back of the sheet at said raised portion and to an area of the sheet contiguous to said raised portion.

4. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting contact between a raised portion of a sheet and a surface bearing coating material, and exerting pressure upon the back of the sheet by an air jet impinging directly thereon at an area thereof contiguous to said raised portion.

5. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting contact between a raised portion of a sheet and a surface bearing coating material, and exerting pressure upon the back of the sheet by an air jet impinging directly thereon at said raised portion and upon an area of the sheet contiguous to said raised portion.

6. In the art of applying coating material to sheets, the method which comprises effecting wiping contact between a sheet and a surface bearing coating material, and applying air under pressure directly to the back of the sheet in the region of the wiping contact.

7. In the art of applying coating material to sheets, the method which comprises effect-

ing wiping contact between a sheet and a surface bearing coating material, and exerting pressure on the back of the sheet by an air jet impinging thereon in the region of the wiping contact.

8. In the art of applying coating material to sheets having raised portions of their coating-receiving faces, the method which comprises effecting wiping contact between a raised portion of a sheet and a surface bearing coating material, and applying air under pressure directly to the back of the sheet in the region of the wiping contact to an area of the sheet contiguous to said raised portion.

9. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting wiping contact between a raised portion of a sheet and a surface bearing coating material, and exerting pressure on the back of the sheet in the region of the wiping contact to an area of the sheet contiguous to said raised portion by an air jet impinging directly upon said area.

10. In the art of applying coating material to sheets having raised portions on their coating-receiving faces, the method of insuring coating of said sheets in regions adjacent said raised portions which comprises effecting wiping contact between a raised portion of a sheet and a surface bearing coating material, and exerting pressure on the back of the sheet in the region of the wiping contact to areas of the sheet at and contiguous to said raised portion by an air jet impinging directly upon said areas.

11. Apparatus for applying coatings to sheets having raised portions adjacent their corners, comprising a rotatable coating roll, means for bringing a corner and a raised portion of a sheet into contact with said roll, and means for applying air under pressure directly to the back of the sheet at an area thereof contiguous to said raised portion.

12. Apparatus for applying coatings to sheets having raised portions adjacent their corners comprising a rotatable coating roll, means for bringing a corner and a raised portion of a sheet into contact with said roll, and means applying air under pressure directly to the back of the sheet at said raised portion, and an area of the sheet adjacent said raised portion.

13. Apparatus for applying coatings to sheets having raised portions comprising a surface bearing coating material, means for bringing a raised portion of a sheet into contact with said surface, means for applying air under pressure directly to the back of the sheet at an area thereof contiguous to said raised portion, and means for effecting wiping action between said sheet and said surface

during the exertion of said pressure upon the sheet.

14. Apparatus for applying coatings to sheets having raised portions comprising a surface bearing coating material, means for bringing a raised portion of a sheet into contact with said surface, means applying air under pressure directly to the back of the sheet at said raised portion and an area of the sheet adjacent said raised portion, and means for effecting wiping action between said sheet and said surface during the exertion of said pressure upon the sheet.

15. Apparatus for applying coatings to sheets having raised portions adjacent their corners comprising a rotatable coating roll, means for bringing a corner and a raised portion of a sheet into contact with said roll, means for directing a jet of air directly against the back of the sheet, and means for moving said sheet with respect to said jet.

16. Apparatus for applying coatings to sheets having raised portions adjacent their corners comprising a rotatable coating roll, means for bringing a corner and a raised portion of a sheet into contact with said roll, means for directing a jet of air directly against the back of the sheet, and means for moving said sheet and said surface with respect to said jet.

17. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, a second roller disposed closely adjacent thereto, means for feeding a sheet between said rollers, an air passage having its outlet directed against said first named roller adjacent said second named roller, and means for delivering air under pressure to said passage.

18. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, a guide member having a surface adjacent said roller, means for passing a sheet between said roller and guide member, a passage whose outlet is directed toward said roller and disposed adjacent said guide member, and means for delivering air under pressure to said passage.

19. Apparatus for applying coatings to sheets, comprising a roller bearing coating material a second roller disposed adjacent thereto, a guide member disposed adjacent said first named roller, means for delivering a sheet between said rollers and between said first named roller and said guide member, a passage having an outlet directed toward said first named roller and disposed between said second named roller and said guide member, and means for delivering air under pressure to said passage.

20. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, means for bringing a sheet into contact with said roller, and means for applying pressure to the back of said sheet at the region

of contact with said roller comprising a member having a passage, means for delivering air under pressure into said passage, and a plurality of passages communicating with said first named passage and having their outlets directed towards said roller.

21. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, means for bringing a sheet into contact with said roller, and means for applying pressure to the back of said sheet at the region of contact with said roller comprising a member having a passage, means for delivering air under pressure into said passage, a plurality of passages communicating with said first named passage and having their outlets directed towards said roller, and means for blocking off a desired number of said passages.

22. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, a co-acting roller between which and said first named roller a sheet is passed in contact with said first named roller, a member extending longitudinally of said second named roller and having therein a longitudinally extending passage, means for delivering air under pressure to said passage, and a plurality of passages communicating with said passage and having their outlets disposed along said second named roller adjacent thereto and directed towards said first named roller.

23. In the art of applying adhesive to tabbed wrappers, the method of insuring coating of said wrappers adjacent said tabs which comprises effecting contact between a wrapper and an adhesive coated surface, and applying air under pressure to the back of said sheet at and contiguous to the tabs.

24. Apparatus for applying coatings to sheets, comprising a roller bearing coating material, means to guide sheets into contact with said rollers, means to strip sheets from said roller, means to apply pressure to the back of each of said sheets disposed between said first and second means and comprising a member having a passage directed toward said roller, and means to deliver air under pressure to said passage.

25. Apparatus for applying coating to sheets comprising a rotating roller bearing coating material, a guide member having a surface adjacent said roller, means for passing a sheet between said roller and guide member at a speed less than the surface speed of said roller, a passage having an outlet adjacent and directed toward said roller, and means for delivering air under pressure to said passage.

26. In the art of applying coating material to sheets, the method which comprises effecting contact between a sheet and a moving surface bearing thereon coating material, effecting relative movement between said surface

and the sheet in contact therewith, and during said relative movement, applying air under pressure to the sheet to force it into more intimate contact with said surface.

27. In the art of applying coating material to sheets having raised portions, the method which comprises bringing a raised portion of a sheet into engagement with a moving surface bearing thereon coating material, effecting relative movement between said surface and the sheet in engagement therewith, and during said relative movement, applying air under pressure to the back of the sheet.

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