April 28, 1942. W. F. THIELE ET AL 2,281,340

PAPER COATING DEVICE

Filed Sept. 8, 1939 3 Sheets-Sheet 1

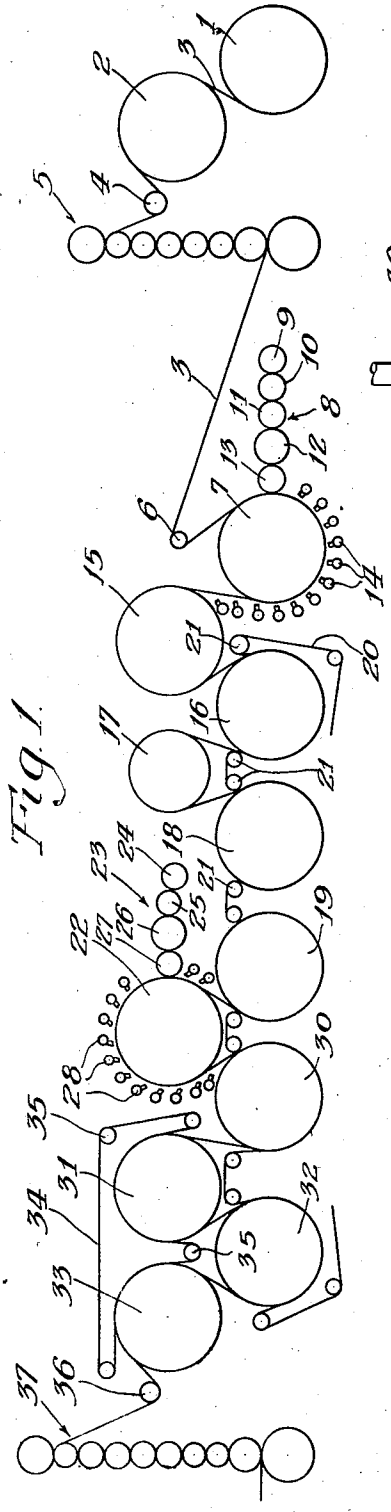


Fig. 1.

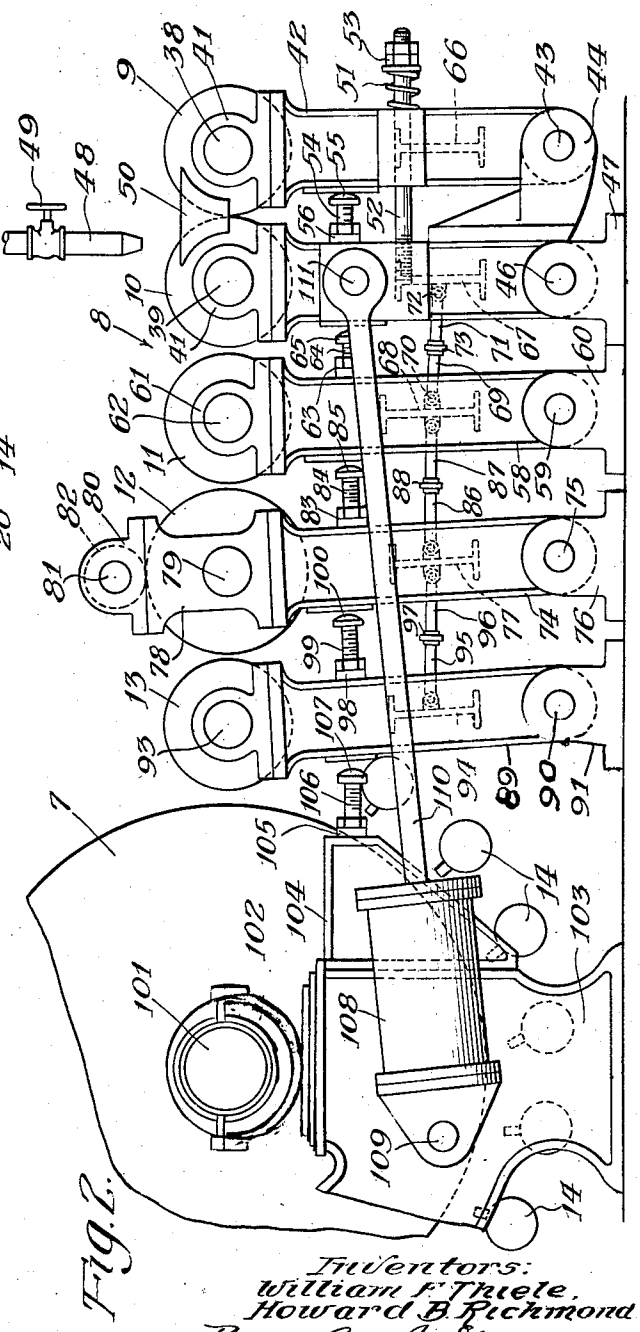


Fig. 2.

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Fig. 1a.

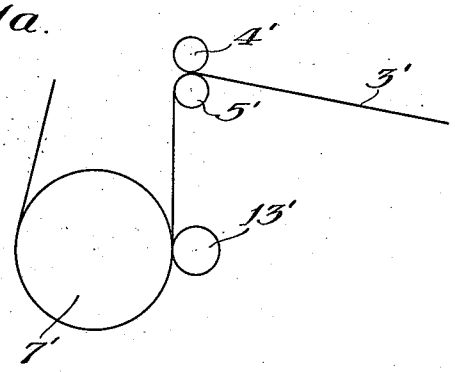
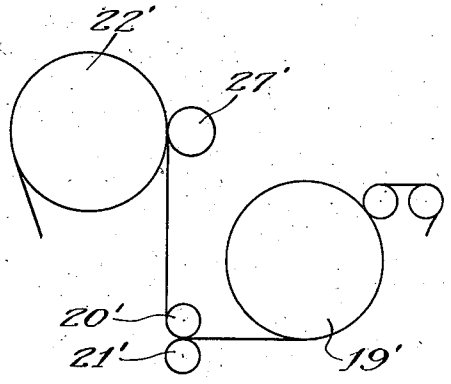


Fig. 1b.



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PAPER COATING DEVICE

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Fig. 3.

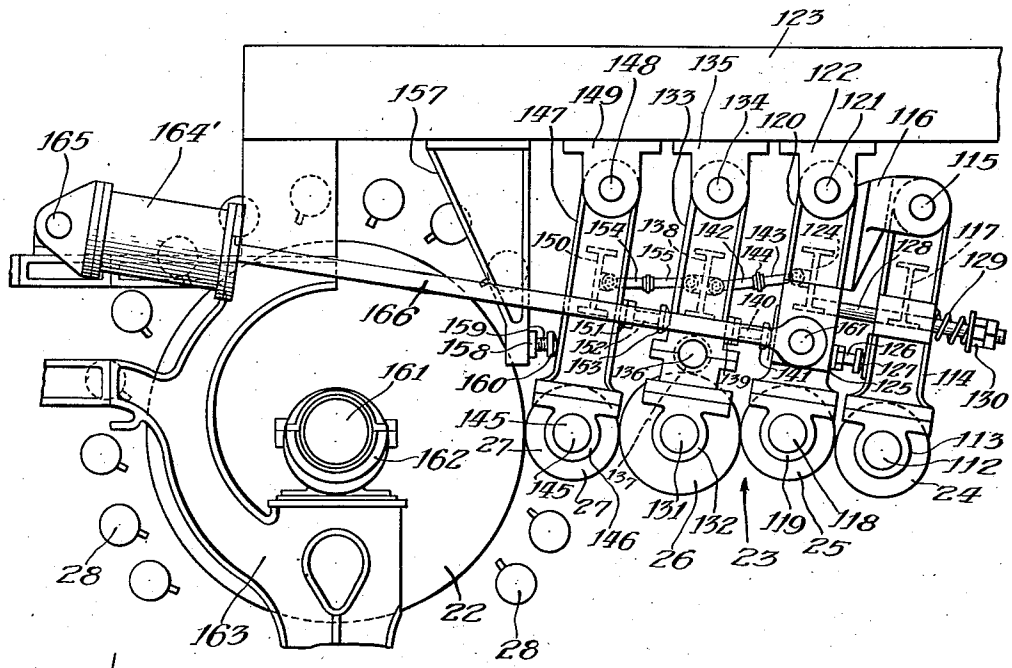
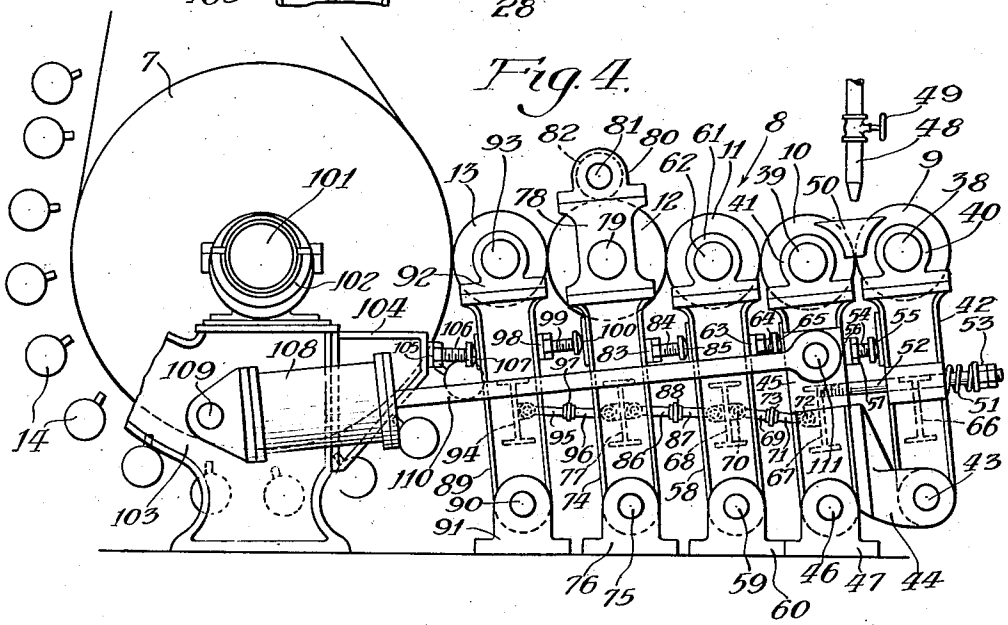


Fig. 4.



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UNITED STATES PATENT OFFICE

2,281,340

PAPER COATING DEVICE

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Application September 8, 1939, Serial No. 293,982

3 Claims. (Cl. 91—55)

This is a continuation-in-part of our co-pending application for United States Letters Patent, Serial No. 181,665, filed December 24, 1937, and entitled Paper coating device.

This invention relates to improvements in coating devices, and refers specifically to a device for coating paper, paperboard, fabric or other web-like material by means of rolls while the web-like material is passing around a drum drier.

The present invention is applicable to the coating of light-weight papers to render the same opaque; coating wall paper, relatively heavy paperboard, and is particularly adaptable for coating so called newsprint paper to produce a fine printing surface thereon.

The objects and advantages of my invention will be apparent from the accompanying drawings and following detailed description.

In the drawings,

Fig. 1 is a diagrammatic side elevational view of my coating system.

Fig. 1*a* is a diagrammatic view illustrating a modified arrangement for tensioning the web prior to coating.

Fig. 1*b* is a similar view illustrating a similar relationship as applied to the mechanism for coating the opposite side of the web.

Fig. 2 is a fragmentary side elevational view of the coating unit illustrating the distributing rolls in separated relationship.

Fig. 3 is a fragmentary side elevational view of the coating unit for the opposite side of the paper.

Fig. 4 is a view illustrating the coating unit shown in Fig. 2 with the distributing rolls in operative position.

Referring in detail to the drawings, 1 and 2 indicate the last two drying drums of a conventional battery of driers (not shown) which follow the wet end of the usual paper machine. A web of paper or paperboard 3 passes around drums 1 and 2 as it terminates its travel through the drier battery and is carried around roll 4 and passed to the upper nip of the calender or super-calender stack 5. The paper upon passing through the calender stack 5 is given a primary calendering before it is coated, which is an important step in securing a high finished paper or board. If a high finish is not desired, the calender 5 may be eliminated. If a high or smooth finish is desired the web 3 when it passes through the stack 5 is free from small hills and valleys and craters, which result is accomplished by calendering the web while it has a predetermined moisture content.

To secure the desired moisture content cold water may be circulated through drum 2 and, if desired, cold water may be circulated through roll 4. When these members are so cooled, a film of moisture will collect upon their surfaces due to the condensation of the moist air which usually surrounds this portion of the machine. This moisture is imparted by the roll 4 and/or drum 2 to the web. If the web 3 is exceptionally moist going to calender 5, steam heated rolls in the calender may be used.

After leaving calender 5, web 3 is carried over guide roll 6 and thence passed into contact with the surface of the heated drying drum 7. A bank of rolls 8 are positioned adjacent drum 7, said bank comprising rolls 9, 10, 11, 12 and 13 which latter roll is in contact with or closely adjacent web 3 carried upon drum 7. The bank of rolls 8 comprises a coating device and will be hereinafter described in greater detail.

The roll 13 imparts a pre-worked film of coating material to one surface of web 3 while the same is on the drum 7. A plurality of nozzles 14 are disposed adjacent the path of travel of the web 3 during its passage on drum 7 and are adapted to discharge hot or cold air into contact with the coating recently applied to the web surface to set the coating sufficiently to prevent it being marred by subsequent operations.

It is highly desirable that the web 3 when trained around roll 7 be free of wrinkles, folds or other irregularities. Consequently, it must be carried around roll 7 with a relatively high degree of tension so that it conforms minutely with the surface of the drum. In addition, roll 13 may be driven at a slightly greater peripheral speed than that of the drum 7 and web 3, and hence there is a tendency to move the web relative to the surface of the drum 7, that is, to crinkle the web. Therefore, it usually is desirable to pass the web 3' Fig. 1*a* between two contacting, driven rolls 4' and 5' prior to the passage of the web around the drum 7', the function of which rolls is to maintain a constant condition of tension, (depending upon the speed at which said rolls are driven) in the web between themselves and the drum 7' irrespective of the tension of the web as it leaves the calender 5. The two contacting driven rolls will take the place of the conventional roll 6 illustrated, but when the two rolls are used, the web will travel substantially vertical from said rolls to the nip between drum 7' and roll

13'. It will readily be seen that an arrangement of this type will compensate for any differences in speed between the sections of the machine ahead of, and behind the drum 7'.

Web 3 after leaving drum 7 is passed around a heated drier drum 15 with its coated surface on contact with the drum surface. However, the preliminary set given the coating by the air from the nozzles 14 permits this contact without detrimental effect to the coating. After leaving drum 15, web 2 is carried into contact with drums 16, 17, 18 and 19, the web being confined, while in contact with drums 16, 18 and 19 by blanket or felt 20 which is guided by suitable rollers 21. Upon passing over the above mentioned drums the coating is completely dried since all of said drums are heated and tend to drive off the moisture content of the coating material.

Two distinct advantages accure from the use of my invention, one, by applying a coating film which has previously been smoothed and reduced to a film of uniform thickness requiring no scraping or brushing while on the web, a coating material may be used which has a relatively high solids content and, hence, a low moisture content, and secondly, by applying this film with an already reduced moisture content to the web while it is traveling on the heated surface of drum 7, a rapid initial setting of the coating takes place permitting subsequent operations to be performed in a short period of time. This latter coupled with the provision of the nozzles 14 permit of using my invention at high web speeds without danger of damage to the coated surface.

If paperboard is to be coated, the surface of said board being more absorbent than the usual paper will tend to quickly absorb the liquid carrier of the coating material, and therefore the heated drum alone without the air driers may be sufficient to properly set the coating film.

After leaving drum 19, web 3 is carried around heated drum 22 with the coated side of said web in contact with the drum surface. A bank of rolls 23 is disposed adjacent drum 23 comprising rolls 24, 25, 26 and 27, the last mentioned roll being in contact with, or closely adjacent web 3 upon drum 22. The bank 23 comprising a coating unit for coating the reverse side of web 3, and will be hereinafter more fully described. A plurality of nozzles 28 are positioned around drum 22, and, similar to nozzles 14, are adapted to direct hot or cold air into contact with the freshly coated surface to preliminarily set the coating.

The web, after leaving drum 19', Fig. 1b, may be passed between a pair of driven tensioning rolls 20' and 21' similar to the arrangement hereinbefore described with respect to drum 7', said tensioning rolls functioning for the same purpose, that is, to tension the web during its passage between rolls 22' and 27', corresponding to rolls 22 and 27. In addition, if paperboard is to be coated, the blowers 28 may be eliminated, if desired.

After leaving drum 22, the web is carried around drums 30, 31, 32 and 33, all of which may be heated. In passing around drums 30 and 32, the web is confined by blanket or felt 20 and in passing around drums 31 and 33 the web is confined by blanket or felt 34 which is trained over suitable guide rolls 35.

Upon leaving drum 33, web 3 is carried beneath spring roll 36 and passed to the upper nip of a super-calender stack 37 wherein the web is calendered to a fine finish. Thereafter the web may be reeled, cut into sheets or treated otherwise.

If it is desired to coat only one side of the web 3, the bank 8 or 23 may be rendered inoperative, as will be hereinafter described, depending on which side of the web is to be coated.

The coating unit 8 is illustrated in Figs. 2 and 4 in detail, Fig. 2 illustrating the unit in inoperative position, and Fig. 4 illustrating the unit in operative position. Referring particularly to Fig. 4, rolls 9 and 10 are respectively mounted upon shafts 38 and 39 which are journalled in bearings 40 and 41 respectively. Bearing 40 is mounted upon the upper end of standard 42 which, in turn, is pivotally mounted, as at 43, upon member 44. Bearing 41 is mounted on the upper end of standard 45 which, in turn, is pivotally mounted, as at 46, upon support 47. The member 44 which carries standard 42 is rigidly connected to standard 45. It is to be understood, of course, that the rolls 9 and 10 are supported at each end thereof and at the opposite end of the rolls, bearings and standards such as described, are also provided.

The rolls 9 and 10 are adapted to be maintained in substantial contact with each other and the nip thus provided is adapted to carry a quantity of coating material which may be introduced through pipe 48 controlled by valve 49. Substantially triangular dams 50 are positioned at each end of the nip between rolls 9 and 10 and are constructed of a material which, when wet, has a very low degree of frictional resistance, for instance, a rubber compound. The dams 50, of course, serve to retain the coating material in the nip. Rolls 9 and 10 are impelled toward each other by spring 51 which embrace rod 52. Rod 52 is threadedly anchored in standard 45 and projects through standard 42, spring 51 being confined between standard 42 and an adjusting nut 53 carried at the end of rod 52. It can readily be seen that manipulation of the nut 53 controls the force urging rolls 9 and 10 toward each other. A screw 54 having a relatively rounded head 55 is threadedly positioned in boss 56 carried by standard 45. The effective length of screw 54 may be changed by manipulating the screw and the screw may be locked by tightening lock nut 57. Screw 54 extends at substantially right angles to the standard 42 and the head 55 is adapted to make contact with the side of standard 42 to control the minimum distance between the standards. The arrangement is such, therefore, that spring 51 serves to urge rolls 9 and 10 together, and screw 54 serves to limit the proximity of the rolls 9 and 10.

A standard 58 is positioned adjacent standard 45 and is pivotally mounted as at 59 upon support 60. The upper end of standard 58 carries bearing 61 in which shaft 62 is journalled, said shaft in turn carrying roll 11. A boss 63 is carried on the side of standard 58 and an adjusting screw having a relatively rounded head 65 which abuts the side of standard 45. The function of screw 64 is similar to that of screw 54, that is, to control the proximity of rolls 10 and 11.

It is to be understood, of course, that the mechanisms herein described are duplicated upon the opposite ends of the rolls, the I-beams 66, 67 and 68 respectively connecting the two opposite standards 42, 45 and 58. A link 69 is

pivotally connected as at 70 to I-beam 68, another link 71 is pivotally connected as at 72 to I-beam 67. Links 69 and 71 are threaded at their outer end and are connected by means of the turnbuckle 73 by means of which the effective length of the links 69 and 71 can be altered. The function of the links 69 and 71 will be hereinafter more fully described.

A standard 74 is positioned adjacent standard 58 and is pivotally mounted as at 75, upon support 76. The opposite standards 74 are connected by means of I-beam 77. At the upper end of each of the opposite standards a bearing 78 is carried which, in turn, carries shaft 79 upon which roll 12 is mounted. A bearing 80 is positioned at the top of bearing 78 and carries shaft 81 upon which roll 82 is mounted, roll 82 resting by gravity upon roll 12. Both rolls 12 and 82 are adapted to oscillate or reciprocate longitudinally with respect to each other and with respect to the rolls 11 and 13. The mechanism for reciprocating said rolls is conventional and is not believed to need further description.

A boss 83 is carried upon the side of standard 74 and a screw 84 is threadedly positioned in said boss, said screw carrying a relatively rounded head 85 which is adapted to contact the side of adjacent standard 58. A link 86 is pivotally connected to I-beam 77 and link 87 is pivotally connected to I-beam 68, said links being joined at their ends by turnbuckle 88.

A standard 89 is positioned adjacent standard 74 and is pivotally mounted, as at 90, upon support 91. A bearing 92 is carried at the upper end of standard 89 and in turn carries shaft 93 which supports roll 13. The opposite standards 89 are connected by means of I-beam 94 and a link 95 is pivotally mounted upon said I-beam. Another link 96 is pivotally connected to I-beam 77 and said links are joined by means of turnbuckle 97. A boss 98 is carried on the side of standard 89 and a screw 99 is threadedly positioned in said boss, said screw carrying a relatively rounded head 100 which is adapted to abut the side of standard 74.

It can readily be seen that by means of the screws 54, 64, 84 and 99 the proximity of the rolls 9, 10, 11, 12 and 13 with respect to each other can be controlled. It can also be seen that by means of the linkages connecting adjacent standards together the maximum degree of separation of rolls 10, 11, 12 and 13 with respect to each other can also be controlled.

The drier drum 7 is carried upon shaft 101 which is supported by bearings 102 positioned at each end of the shaft. Bearings 102 are mounted upon opposite supports 103 which, in turn, carry extensions 104. A boss 105 is positioned upon the end of extension 104 and a screw 106 is threadedly disposed in said boss, said screw having a relatively rounded head 107 which is adapted to abut the side of the standard 89 and control the degree of proximity between roll 13 and drum 7.

A cylinder 108 is pivotally mounted, as at 109, upon the supporting member 103, said cylinder having a reciprocating rod 110 connected to a piston which operates within said cylinder. The end of rod 110 is pivotally anchored, as at 111, to standard 45. In operation, air under pressure may be introduced into cylinder 108 and tends to move standard 45 toward drum 7. This movement, in effect, brings the rounded heads of all of the screws into contact with the adjacent standards and thereby positions the rolls 10, 11, 12 and 13 at a predetermined minimum distance away from each other. Likewise roll 13 is adjustably positioned with respect to drum 7. When air under pressure is introduced into the opposite end of cylinder 108, the piston rod 110 functions to move standard 45 away from drum 7. When standard 45 is swung about pivot 46, links 69 and 71 pull standard 58, thereby swinging said standard about pivot 59. This action is, in turn, imparted to standards 74 and 89. The relative positions of the standards when the rolls are in contact with each other or in film transferring relationship with respect to each other is such that the distance between adjacent standards is less than the aggregate length of the two links connecting adjacent standards. When piston rod 110 acts to separate said rolls, the swinging of the standards tends to lengthen the distances between adjacent standards to the maximum length of the pairs of links between each standard.

When the fact is considered that the drier drum 7 may be between 3 to 12 feet in diameter, it will be appreciated that the rolls 9, 10, 11, 12 and 13 are of relatively large diameter. In addition, although some of said rolls have rubber surfaces, as will be hereinafter more fully described, the bulk of said rolls comprise metal. The webs which may be coated are frequently of 100 inches or even more in width, consequently, a full appreciation of the length of the rolls 9, 10, 11, 12 and 13 can be had. It can therefore readily be seen that rolls of such length and weight, supported only at their ends, will tend to deflect. By disposing the axis of the rolls 9, 10, 11 and 12 in a substantially horizontal plane, this deflection will occur at right angles to the lines of osculation between adjacent rolls and, consequently, the clearance between adjacent rolls, or the pressure between adjacent rolls if said rolls are in physical contact, will be uniform throughout the length of the rolls and will be uninfluenced by such deflection. Accordingly, when coating material is transferred from the gate rolls 9 and 10 and distributed on the surfaces of rolls 11, 12 and 13, a film of relatively uniform thickness will be supplied to the roll 13, which, of course, is the coating roll. In this manner a relatively smooth, flat film of uniform thickness will be transferred from the roll 13 to the web 3. Also, in view of the fact that the coating material is smoothed and worked, in its travel from roll to roll, it is possible to use a coating material having a high solids content and, consequently, a low liquid content. Hence, when the coating material is applied to the web 3 by the roll 13, it is in a condition approaching the plastic state.

As has been hereinbefore described, roll 7 comprises a drier drum and functions not only as a bed roll against which the roll 13 coats the paper, but also functions to immediately impart heat to the freshly coated paper which tends to bring about the immediate inception of the setting of the coating material. This, coupled with the provision of the nozzles 14 which surround the drum 7, cause a preliminary setting of the coating material upon the web which permits said web to be immediately wrapped around the next adjacent drier drum 15 with its coated surface in contact with the surface of said drum without endangering the finish of the coated surface of the web. Hence, there are three features of our invention which all supplement each other

and which are conducive to the rapid preliminary setting of the coating material, namely, the fact that the coating material is applied to the web in a condition wherein it has a very small proportion of moisture, and being applied to the web while the web is on the heated drier drum, steps are immediately taken to drive off the moisture. Hence, webs can be coated at relatively high speeds in step with the most rapidly operated paper making machines now in use.

Referring particularly to Fig. 3 of the drawings, the coating unit 23 is illustrated in detail. Roll 24 is carried by shaft 112 which, in turn, is journalled in bearing 113, carried at the lower end of standard 114. Standard 114 is pivotally suspended as at 115 upon member 116 and said standard depends downwardly from the pivot point. Of course, shaft 112 is supported at both of its ends by bearings which are carried by opposite standards, the opposite standards being connected by means of I-beam 117.

Roll 25 is carried by shaft 118 which is journalled in bearing 119 carried at the lower end of standard 120. Said standard is pivotally suspended as at 121 upon the supporting member 122 which, in turn, is secured to the overhead structure 123. I-beam 124 connects opposite standards 120 together and a member 116 is rigidly mounted upon each of the standards 120. A boss 125 is carried upon the side of standard 120 and a screw 126 is threadedly positioned in said boss, said screw having a relatively rounded head 127 which is adapted to abut the side of standard 114 to control the degree of proximity of rolls 24 and 25 with respect to each other. A rod 128 is threadedly positioned in standard 120 and a spring 129 circumscribes said rod adjacent its end, said spring being confined between the side of standard 114 and an adjusting nut 130 threadedly positioned upon the end of rod 128. By this arrangement standard 114 is urged toward standards 120 and, consequently, roll 124 is urged towards roll 25.

Roll 26 is mounted upon shaft 131 which is journalled in bearing 132 carried upon the lower end of standard 133 which is pivotally suspended as at 134 from support 135 which, in turn, is carried by the super-structure 123. A shaft 136 is journalled immediately above roll 26 and is adapted to carry roll 137 which rests upon the surface of roll 26. Rolls 26 and 137 similar to rolls 12 and 82 oscillate or reciprocate axially in a conventional manner. Opposite supports 133 are connected together by means of I-beam 138. A boss 139 is carried upon the side of standard 133 and threadedly receives screw 140 having a rounded head 141 which is adapted to abut the side of standard 120 to control the degree of proximity of rolls 25 and 26. A link 142 is pivotally connected to I-beam 138 and another link 143 is pivotally connected to I-beam 124, said links being joined by turnbuckle 144. Links 142 and 143 function in a manner similar to the functioning of the links described in connection with the coating unit 8.

Roll 27 is carried by shaft 145 which is journalled in bearing 146 carried at the lower end of standard 147 which, in turn, is pivotally suspended as at 148 upon support 149 secured to the super-structure 123. An I-beam 150 connects opposite standards 147 together. A boss 151 is carried upon the side of standard 147 and threadedly receives screw 152 which has a rounded head 153 adapted to abut the side of standard 133 to control the degree of proximity of rolls 26 and 27. A link 154 is pivotally connected to I-beam 150 and a link 155 is similarly connected to I-beam 138, said links being joined by turnbuckle 156.

A member 157 is supported from super-structure 123 and carries a boss 158 adjacent its lower end, said boss threadedly receiving screw 159 which has a rounded head 160 adapted to abut the side of standard 147 to control a degree of proximity between roll 27 and drum 22.

Drum 22 is carried by shaft 161 which, in turn, is journalled in bearing 162 carried by the frame member 163. A cylinder 164 is pivotally mounted as at 165 upon a portion of the frame 163 and a reciprocating piston rod 166 projects from said cylinder, the end of said rod being pivotally secured as at 167 to standard 120. By introducing air under pressure to one end of cylinder 164, the piston rod 166 may be caused to move standard 120 away from drum 22. In so moving, standard 114 also moves in unison with standard 120. Likewise, standards 133 and 147 are pulled away from drum 22 and the rolls 25, 26 and 27 are separated from each other. When air under pressure is introduced into the opposite end of cylinder 174, the piston 166 moves standard 120 towards drum 22 until standard 120 contacts the end of screw 140 thereby moving standard 133 toward drum 22. This latter standard then contacts the head of screw 152 thereby moving standard 147 into contact with the head 160 of screw 159. It can readily be seen that by the proper manipulation of screws 126, 140, 152 and 159, the degree of proximity of the various rolls with respect to each other and the degree of proximity of roll 27 with respect to the drum 22 can be controlled.

Rolls 24 and 25 comprise the guide rolls of the unit and the nip between said rolls functions to retain a supply of coating material. The arrangement is substantially similar to that described in conjunction with rolls 9 and 10. The coating material contained with the nip of rolls 24 and 25, during operation of the device is passed from roll 25 to 26 and thence from roll 26 to 27, which latter roll applies the coating material in a smooth, pre-formed film of uniform thickness to the web 3 travelling over drum 22. It can readily be seen that all the advantages inherent in the use of the unit 8 hereinbefore described are also existent in the use of the coating unit 23.

As has been hereinbefore described, rolls 9 and 10 and rolls 24 and 25 are the gate rolls or metering rolls for the coaters 8 and 23 respectively. The passage of coating material from the gate rolls to the remaining rolls of each coating unit is controlled by the screws 54 and 126 respectively and also by driving each pair of gate rolls at speeds varying from the speeds of the distributing rolls. For instance, each pair of gate rolls may be driven by a direct current motor using a conventional "Ward-Leonard" system of control whereby the gate roll speed may be varied from one revolution per minute to the speed of the distributing rolls.

The remaining rolls 11, 12 and 13, and 26 and 27 are positively driven by any conventional drive and are rotated at a peripheral speed equal to the speed of the drums 7 and 22 and, hence, the translatory speed of the web 3.

Rolls 9 and 10 and 24 and 25 are preferably covered with soft rubber. Rolls 13 and 27 are also preferably covered with soft rubber. Rolls 12 and 26 are preferably metal-covered or covered with hard rubber, and roll 11 is preferably

covered with soft rubber. Roll 11, if desired, may be oscillated or reciprocated axially. The rider rolls 82 and 137 are preferably covered with soft rubber and rest by gravity upon rolls 12 and 26 respectively. The rider rolls are driven by friction from rolls 12 and 26. The length of the rubber faces on rolls 13 and 27 is less than the width of the web 3 whereby a ring of coating material will not be built up upon the drums 7 and 22.

It will be noted that adjacent drum 22 two nozzles 28 designated 168 direct a blast of air onto the web 3 before it enters the nip between roll 27 and drum 22. This is to remove whatever free moisture which clings to the sheet after leaving drier 19.

As has been hereinbefore described the present invention is applicable to the coating of light-weight papers made on a multiple drier paper machine and is also applicable to the coating of wall paper. The fact that the coating material has a high solids content, between 30 and 60% solids, paper having a high ground wood pulp content such as newsprint can be readily coated.

It is to be understood, of course, that the supercalendar 5 may be supplanted by any conventional device for smoothing the web surface prior to the application of the coating film thereon, such as, a machine calender, a breaker stack or the like. It is also to be understood that when both sides of the web are to be coated that there need be no intervening drying drums. For instance, in Fig. 1 of the drawings, the second coating unit may be applied to drum 15. If desired, our coating operation may be carried out as a multi-stage process wherein opposite sides of the web are coated a plurality of times while the web is traveling over the driers.

It is to be further understood that, although our invention is particularly adaptable for applying the usual mineral coating to paper or paperboard, other types of coating materials may be used such as water resisting materials, acid resisting material, surface sizing materials or the like. In addition, although coating materials of relatively high solids content can be used, which, of course, is usually of advantage, we are not to be limited to the use of such coatings since lower solids-content coatings may be employed. Further, the unit illustrated in Fig. 1 may be used separately from the paper making machine, providing, of course, that the web 3 contains the desired degree of moisture or is sufficiently dry.

By the expression "paper" as used in the specification and claims is meant paper, paperboard and other web-like materials. By "coating material" is meant the usual mineral coating suspensions or other liquid or semi-liquid web surface influencing agents.

We claim as our invention:

1. A device for coating paper in a continuous manner as it comes from the driers of a paper machine comprising, means for passing the web of paper from the driers of the paper machine to the surface of a heated drier drum, means for carrying said web around a major portion of the surface of said drying drum, whereby said web is brought into heat interchange relationship with the drum surface means for maintaining the tension of the web substantially constant during its travel around said drying drum, a coating unit disposed adjacent said drying drum comprising a roll which contacts said web upon said drum at a point on said drum spaced from the point at which the web initially contacts the drying drum and after the web has traveled over a minor portion of its total travel over said drum surface to preliminarily heat the web prior to the application of coating thereto, means for depositing a coating material on said roll, said roll being adapted to transfer said coating material to said web, while said web is passing over said drying drum, whereby said coating material carried upon said web is given a preliminary set during passage of the web in the remaining major portion of its travel over the surface of said drum.

2. A device for coating a fibrous web as it comes from the driers of a multiple drier paper machine comprising, an auxiliary heated drier drum, a pair of driven contacting rolls disposed adjacent said auxiliary drier drum, means for passing said web between said contacting rolls and around an appreciable degree of the drum surface, whereby said web is brought into heat interchange relationship with the drum surface, said driven contacting rolls maintaining said web in a substantially constant degree of tension as it passes around said drum surface, a coating unit disposed adjacent said drier drum comprising a plurality of osculating rolls, one of said osculating rolls contacting said web upon said drum at a point on said drum spaced from the point at which the web initially contacts the drying drum and after the web has traveled over a minor portion of its total travel over said drum surface to preliminarily heat the web prior to the application of coating thereto, means for depositing a coating material upon said osculating rolls, the osculating roll in contact with said web being adapted to deposit a smooth film of coating material of relatively uniform thickness upon the web while the web is passing over the drier drum, the heat of said drier drum assisting to preliminarily set the coating material on said web during passage of the web in the remaining major portion of its travel over the surface of said drum.

3. A device for coating a fibrous web as it comes from the driers of a multiple drier paper machine comprising, an auxiliary heated drier drum, a pair of driven contacting rolls disposed adjacent said auxiliary drier drum, means for passing said web between said contacting rolls and around a major portion of the drum surface, whereby said web is brought into heat interchange relationship with the drum surface, said driven contacting rolls maintaining said web in a substantially constant degree of tension as it passes around said drum surface, a coating roll disposed in contact with the web upon said drum at a point on said drum spaced from the point at which the web initially contacts the drying drum and after the web has traveled over a minor portion of its total travel over said drum surface to preliminarily heat the web prior to the application of coating thereto, means for depositing a coating material upon said coating roll, the coating roll in contact with said web being adapted to deposit a smooth film of coating material of relatively uniform thickness upon the web while the web is passing over the drier drum, the heat of said drier drum assisting to preliminarily set the coating material on said web during passage of the web in the remaining major portion of its travel over the surface of the drum.

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