

March 15, 1932.

J. W. COSGROVE

1,849,540

COATING MACHINE

Filed Jan. 16, 1929

Fig. 1.

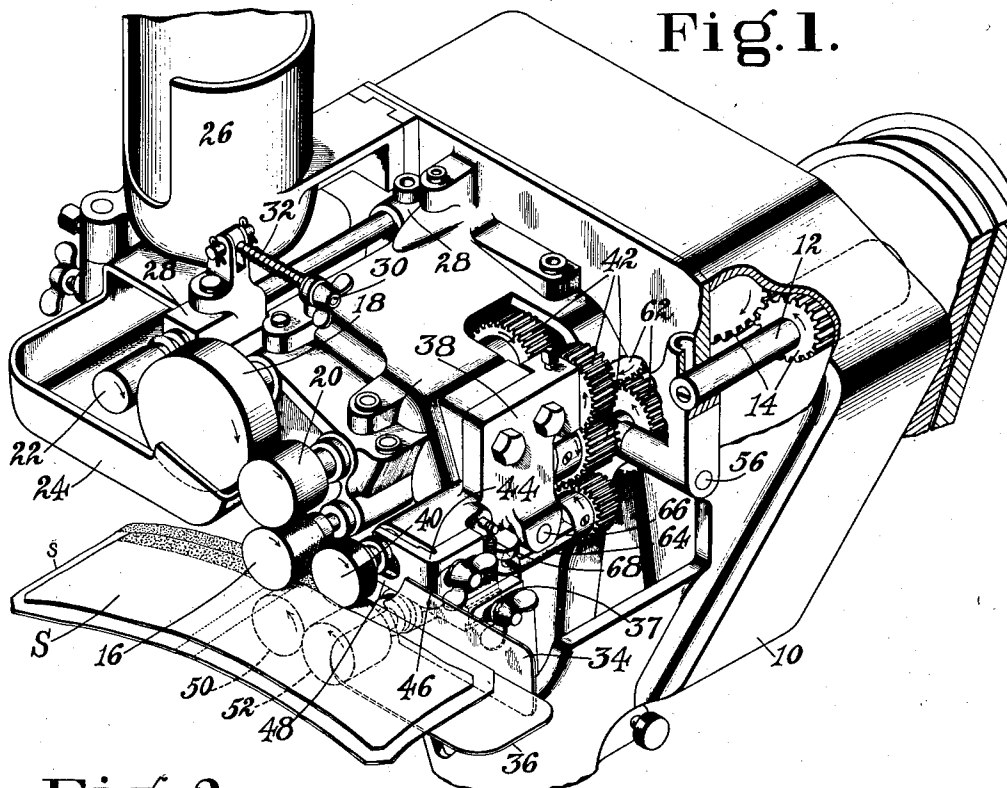


Fig. 2.

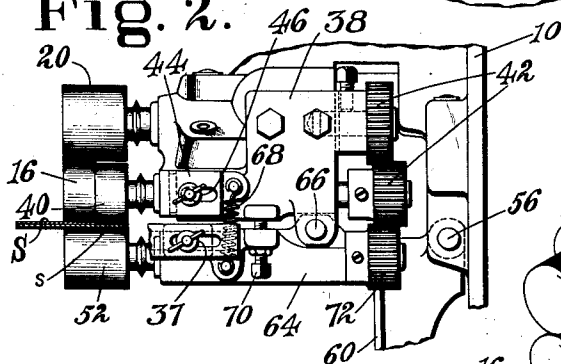


Fig. 4.

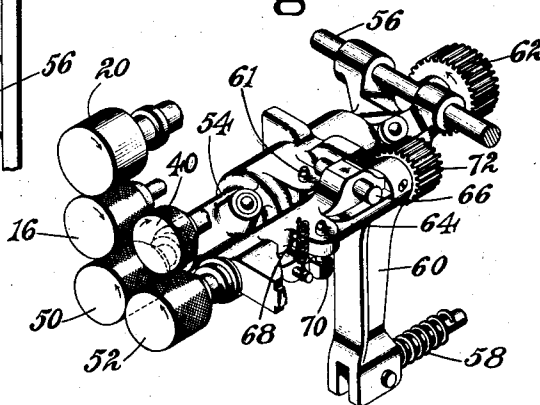
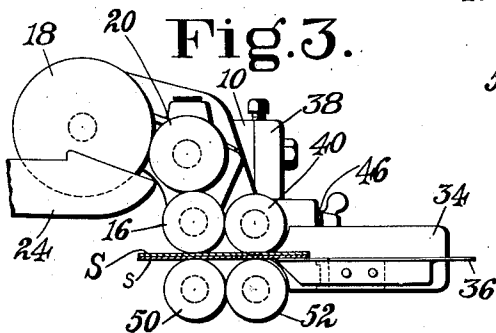


Fig. 3.



INVENTOR-

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By her attorney,
Nelson W. Howard.

UNITED STATES PATENT OFFICE

JOHN W. COSGROVE, DECEASED, LATE OF MEDFORD, MASSACHUSETTS, BY CAROLINE E. COSGROVE, ADMINISTRATRIX, OF MEDFORD, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY

COATING MACHINE

Application filed January 16, 1929. Serial No. 332,903.

This invention relates to machines for applying a coating to work-portions, and especially concerns the application of adhesive-substances to material of different thicknesses.

5 An example of work for which this machine is peculiarly adapted is found in the securing, by cement, of the edges of the outer finish-material to the inner stiffening or body-material, which materials are combined in the production of book-covers. In making these, the outer cover-portion is cut to extend outside the body-portion sufficiently to allow the former to be turned in about the entire periphery of the body, so it may be cemented thereto. To obtain the proper adhesion, especially if latex be employed as the cement, it is important that both the surfaces of the work which are to be brought into contact be coated. There is consequently presented the problem of applying a substantially uniform coating to a layer which combines the thickness of the inner and outer cover-portions and to the thinner portion furnished by the projecting marginal edge of the outer cover-portion. The present invention provides for the successful performance of work of this character by the employment of a plurality of coating-applying members, rotatable rolls for example, these being respectively arranged to operate simultaneously upon different areas on the same side of the work. For coating two thicknesses of material, these rolls or members preferably include one which is narrower than its companion, this narrower roll operating, as herein illustrated, over the thin portion of the work, while the other roll contacts with the thicker portion. To insure the correct location of the coating, means is furnished for varying an area operated upon, as by adjusting the narrow roll across the face of its companion. Proper engagement of the work with the applying members is obtained by pressure members each of which cooperates

with a corresponding applying member and is independently movable toward and from its associated applying member. Herein is illustrated a work-supporting roll for each applying roll, each supporting roll being arranged in a yieldable mounting. The cement or other coating substance is preferably supplied to one applying roll, while the associated applying roll takes its supply from its companion applying roll. This feed may be through a chain of elements receiving cement from a receptacle and consisting of a supplying roll rotatable in the receptacle, a delivering roll co-operating with the supplying roll, and a plurality of applying rolls receiving cement from the delivering roll, one of the applying rolls obtaining its supply from its interposed companion. To avoid coagulation of such adhesives as latex and to avoid dripping of the cement, all these rolls rotate in the same direction.

In the accompanying drawings is illustrated a single embodiment of this invention,

Fig. 1 showing in perspective the upper portion of a cementing machine adapted for operation upon book-covers or the like;

Fig. 2 illustrating in front elevation a portion of the roll system of the machine;

Fig. 3 showing these elements in side elevation; and

Fig. 4 being a perspective view of the rolls with their mountings, parts being broken away.

The general machine structure, modified to give the organization of the present invention, may be that disclosed in the application filed on March 6, 1928, in the name of Caroline E. Cosgrove, administratrix of the estate of John W. Cosgrove, deceased, and bearing the Serial No. 259,537. In this earlier apparatus, a frame 10 has journaled in it a driving shaft 12, which, through gearing, shown in part at 14, rotates about horizontal axes in the direction indicated by the arrows in Fig. 1, a cement-applying roll 16, a cement-

supplying roll 18, an intermediate roll 20 delivering cement from the supplying to the applying roll, and a stripping roll 22 acting upon the supplying roll. This supplying roll 18 takes its cement from a receptacle 24, which is fed barometrically from a container mounted in a holder 26. Cement is thus raised from the receptacle by the roll 18 and delivered under the control, as to quantity, of the roll 22 upon the intermediate roll 20, by which it is transferred to the applying roll 16. Since all the rolls of this chain rotate in the same direction, there is no churning of the adhesive between them, which action has such a tendency to coagulate latex. Instead, the adhesive is successively deposited by each roll upon that in advance of it, and any excess upon a roll is delivered by the up-going side to the preceding roll, to be returned to the receptacle 24 without dripping. The space between the stripping roll 22 and the supplying roll 18, and therefore the quantity of the adhesive which the latter roll may convey to the roll 20, may be varied by adjusting the roll 22. For this purpose, it is mounted in movable bearings 28, and may be drawn toward the roll 18 by a threaded rod and nut 30, a spring 32 exerting its force to hold the stripping roll away from the supplying roll. The applying surface of the roll 16 is preferably of such length that it extends from the vertical plane of an edge-gage 34, rising at the inner side of a feed-table 36, outwardly for a sufficient distance to permit it to coat to the desired width the margin of the thick portion of the work. This may consist of the material for a book-cover, made up of an inner body-layer or backing S and an outer finish-layer s projecting beyond the inner layer in preparation for turning in and securing to the body S to furnish a finished edge. To allow the total width operated upon to be changed, the gage and table may be adjusted by a slot-and-screw connection 37 to its mounting.

Journalled in a bracket 38 secured to the front of the frame 10 is a shaft of a second applying roll 40 in series relation to the first applying roll 16. This roll 40 is rotated by a chain of three gears 42 from the shaft of the roll 20. The direction of rotation of the roll 40 is the same as of the rolls already described and for the same reasons. The width of the roll 40 is less than that of the roll 16, being substantially such that it will operate over the maximum width of the exposed margin of the thin layer s when the outer edge of this margin contacts with the gage 34. To allow the roll 40 to coat the margin closely to the shoulder formed by the layer S when the work is against the gage 34, this roll is variable in position transversely of the margin and of the direction of advance of the work during its coating. This may be accomplished by an angular adjusting member

44 held upon the bracket 38 by a slot-and-screw connection 46 and being forked at 48 to engage circumferential flanges upon the shaft of roll 40. By loosening the securing means for the member 44, this may be shifted in or out to alter the relation of the outer edge of the roll 40 to the edge-gage and thus provide for the complete coating of thin marginal portions of different widths. The roll 40 is situated in such proximity, in a horizontal plane, to the roll 16 as to receive cement therefrom, taking it from that section of the periphery of the roll which is above the thin portion of the work, and which therefore performs no coating function.

Co-operating with each of the applying rolls 16 and 40 is a lower work-supporting roll, these being numbered 50 and 52, respectively. These lower rolls may be equal in length to the roll 16, and are yieldably mounted to press the work against the applying rolls and insure proper coating engagement. The roll 50 has a shaft rotatable in an arm 54 pivoted at 56 upon the frame 10, and is urged toward the roll 16 by a spring 58 interposed between the frame and a depending portion 60 of the arm. A screw 61, threaded through the arm and contacting with the frame, enables the operator to adjust the normal spacing between the supporting roll and applying roll. This is such that they operate out of contact, and consequently the supporting roll does not receive cement from its companion. They are, however, close enough to cause the portion S of the work to be effectively forced into engagement with the applying roll 16. The roll 50 is turned in a direction opposite to that of the roll 16 and from the shaft of said roll by gearing 62. The shaft of the roll 52 is journaled in an arm 64 pivoted at 66 upon the bracket 38. A spring 68 connects the arm and bracket and effects the yielding co-operation of this supporting roll with its applying roll 40, a screw 70 adjustably determining the extent of separation of the rolls. A gear 72 upon the shaft of the roll 52 meshes with the lower gear of the series 42. The direction of rotation of the pairs of rolls 16, 50 and 40, 52 is therefore such that they co-operate to feed the work forward during the application of cement. The arm 64 preferably carries, secured to it at 37, the gage 34 with its table 36.

The general operation of the machine is as follows: Latex or other cement, fed to the receptacle 24 from a container within the holder 26, is elevated from said receptacle by the supplying roll 18, the quantity which this roll raises from the receptacle being determined by the adjustment of the stripping roll 22. The cement upon the roll 18 is deposited upon the intermediate delivering roll 20, and, in turn, by the latter upon the long applying roll 16. The inner section of this

long applying roll delivers cement to the narrow applying roll 40 by means of that portion of its surface which is over the thin margin of the layer *s*, and therefore performs no coating. The roll 40 has been adjusted in or out by means of the member 44 until, when the edge of the work is against the gage 34, this roll 40 will fully coat the margin at *s*, it being remembered that the outer section of the roll 16 operates over and coats the adjacent margin of the thicker portion *S*. When the work is introduced beneath the applying rolls 16 and 40, it is pressed against these by the supporting rolls 50 and 52, these acting independently to bring the thick and thin layers into proper coating engagement with the rolls 16 and 40, respectively. On account of the capacity of each supporting roll for self-adjustment, there is insured a substantially uniform coating over the entire area to be operated upon, regardless of the difference in thickness.

Having described the invention, what is claimed as new and desired to be secured by Letters Patent of the United States is:

1. In a coating machine, a plurality of coating-applying members respectively arranged to coat simultaneously different areas of the same side of the work, and adjustable means cooperating with one of said members for varying one of the areas operated upon.

2. In a coating machine, a plurality of coating rolls arranged to operate upon the same side of the work, and means for rotating the rolls to advance the work to be coated, the coating faces of the rolls being differently situated transversely to the direction of advance.

3. In a coating machine, a plurality of coating rolls arranged to operate upon the same side of the work, means for rotating the rolls to advance the work to be coated, the coating faces of the rolls being differently situated transversely to the direction of advance, and means arranged to vary the transverse position of one of the rolls.

4. In a coating machine, a coating roll, a second coating roll more narrow than its companion, said rolls contacting successively with the same side of the work, and adjustable means for changing the position of the narrower roll across the face of the companion roll.

5. In a coating machine, a plurality of coating members each operating upon an area of the work different from another coating member, a pressure member co-operating with each coating member to form a pair, and means permitting independent relative movement of the members of each pair toward and from each other.

6. In a coating machine, a plurality of pairs of coating members and cooperating pressure members, mounting means for said members permitting independent relative

movement of the members of each pair toward and from each other, and means arranged to adjust independently the normal space between the members of each pair.

7. In a coating machine, two coating rolls arranged to operate upon the upper face of the work, a work-supporting roll co-operating with each coating roll, and a yieldable mounting for each supporting roll.

8. In a coating machine, a coating-applying roll, means for supplying the coating substance to the applying roll, and a second applying roll receiving coating substance from the first-mentioned applying roll and operating upon the same side of the work.

9. In a coating machine, a coating-applying roll, a coating-supplying roll co-operating therewith, and a second applying roll receiving the coating substance from the applying roll first mentioned.

10. In a cementing machine, a cement-applying roll, a cement-supplying roll co-operating therewith, a second applying roll receiving cement from the applying roll first mentioned, and means for rotating all of said rolls in the same direction.

11. In a cementing machine, a cement-receptacle, a supplying roll rotatable therein, a cement-delivering roll co-operating with the supplying roll, an applying roll receiving cement from the delivering roll and an applying roll receiving cement from a portion of the width of the other applying roll, said rolls coating adjacent portions of a piece of work which are different in character.

12. In a cementing machine, a cement-receptacle, a supplying roll rotatable therein, a cement-delivering roll co-operating with the supplying roll, an applying roll receiving cement from the delivering roll, and a second applying roll receiving cement from the first-mentioned applying roll.

13. In a cementing machine, a cement-receptacle, a supplying roll rotatable therein, a cement-delivering roll co-operating with the supplying roll, and a plurality of applying rolls in series relation, with one roll receiving cement from the delivering roll and delivering to the next succeeding rolls, said rolls operating over different areas of the work.

14. In a cementing machine, a cement-receptacle, a supplying roll rotatable therein, a cement-delivering roll co-operating with the supplying roll, an applying roll receiving cement from the delivering roll, and a second applying roll receiving cement from and being of less width than the first-mentioned applying roll.

15. In a cementing machine, two rotatable cement-applying rolls, said rolls operating in substantially the same horizontal plane, a work-supporting roll co-operating with each applying roll, and a yieldable bearing for each supporting roll.

16. In a cementing machine, two rotatable cement-applying rolls, said rolls operating in substantially the same horizontal plane, a work-supporting roll co-operating with each applying roll, a pivoted arm in which each supporting roll is journaled, and a spring acting upon each arm. 70
17. In a cementing machine, two rotatable cement-applying rolls, said rolls operating in substantially the same horizontal plane progressively to coat a piece of work moved over said rolls, a work-supporting roll co-operating with each applying roll, a yieldable bearing for each supporting roll, and means for varying the position of one of the rolls transversely of the direction of progress of the work. 75
18. In a cementing machine, two rotatable cement-applying rolls, said rolls operating in substantially the same horizontal plane, a work-supporting roll co-operating with each applying roll, a pivoted arm in which each supporting roll is journaled, a spring acting upon each arm, and an adjusting member acting upon one of the cement-applying rolls to vary its position with respect to the coated area of a piece of work. 80
19. In a machine for cementing work having a marginal portion thinner than the adjacent portion, an edge-gage, a rotatable cement-applying roll extending from the gaging plane over the thin margin and contacting with the adjacent portion, an independently driven rotatable cement-applying roll operating only upon the marginal portion of the work, and means for maintaining the work in engagement with each roll. 85
20. In a machine for cementing work having a marginal portion thinner than the adjacent portion, an edge-gage, a rotatable cement-applying roll extending from the gaging plane over the thin margin and contacting with the adjacent portion, a rotatable cement-applying roll operating only upon the marginal portion of the work, a rotatable work-supporting roll co-operating with each applying roll, and an independently yieldable bearing for each supporting roll. 90
21. In a machine for cementing work having a marginal portion thinner than the adjacent portion, an edge-gage, a rotatable cement-applying roll extending from the gaging plane over the thin margin and contacting with the adjacent portion, a rotatable cement-applying roll operating only upon the thin marginal portion of the work, means for maintaining the work in engagement with each roll, and means co-operating with the roll acting only upon the thinner margin for varying the position of said roll transversely of said margin. 95
22. In a machine for cementing work having a marginal portion thinner than the adjacent portion, an edge-gage, a rotatable cement-applying roll extending from the gag-
- ing plane over the thin margin and contacting with the adjacent portion, a rotatable cement-applying roll operating only upon the marginal portion of the work, means for supplying cement to the roll contacting with the body of the work, the marginal applying roll being arranged to receive cement from the companion applying roll, and means for maintaining the work in engagement with each roll. 100
- In testimony whereof I have signed my name to this specification. 105
- CAROLINE E. COSGROVE,
Administratrix of the Estate of John W. Cosgrove, Deceased. 110
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