

March 10, 1925.

1,528,935

F. J. MacDONALD

EDGE COATING METHOD AND APPARATUS

Filed Aug. 1, 1921

2 Sheets-Sheet 1

Fig. 1

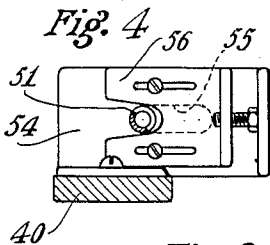
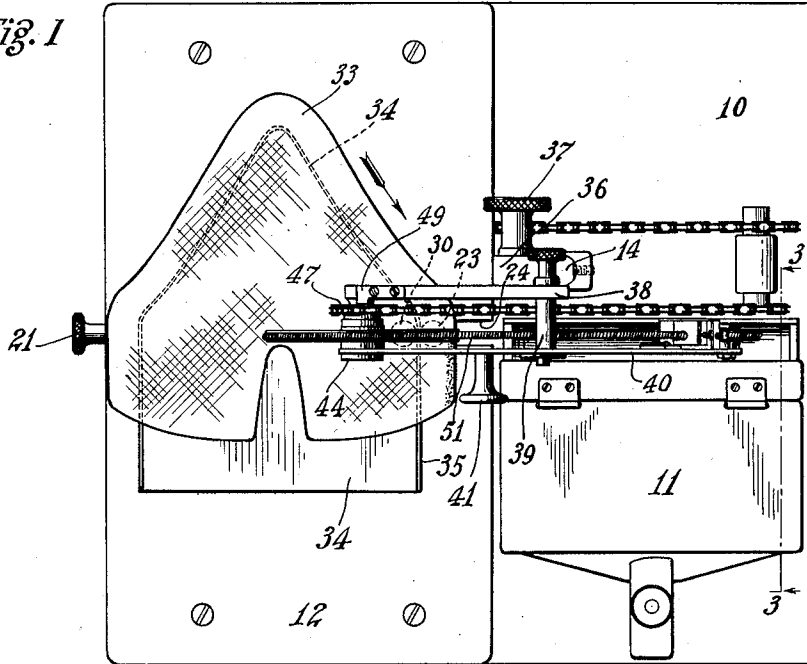


Fig. 2

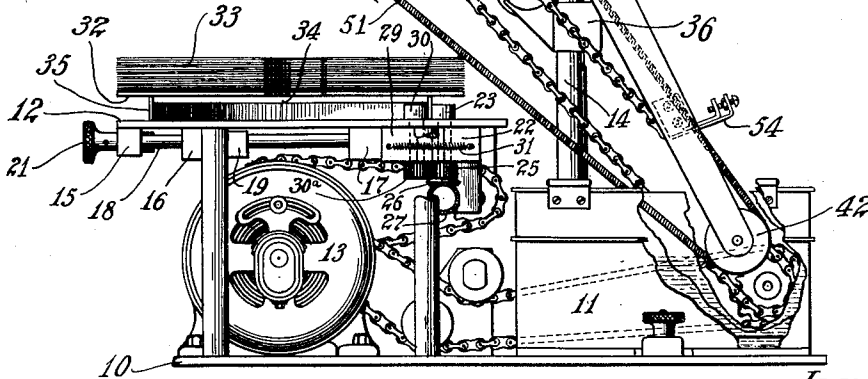
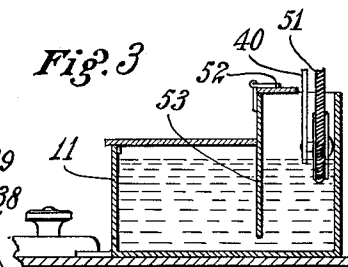


Fig. 3



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Fig. 5

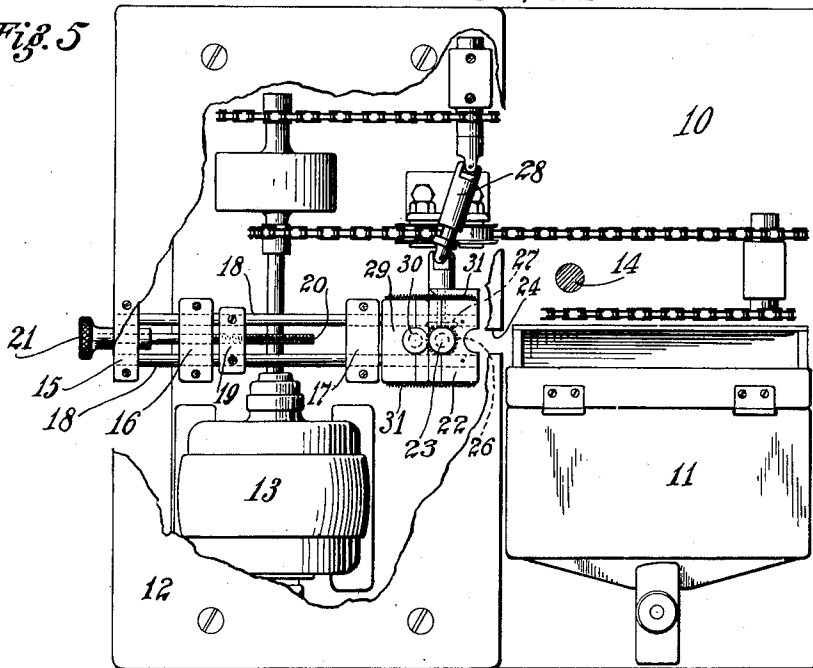


Fig. 7

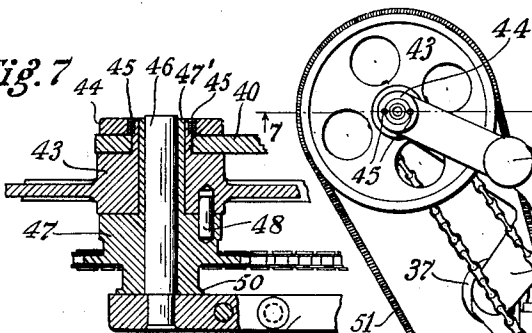


Fig. 8

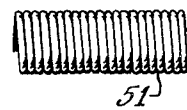
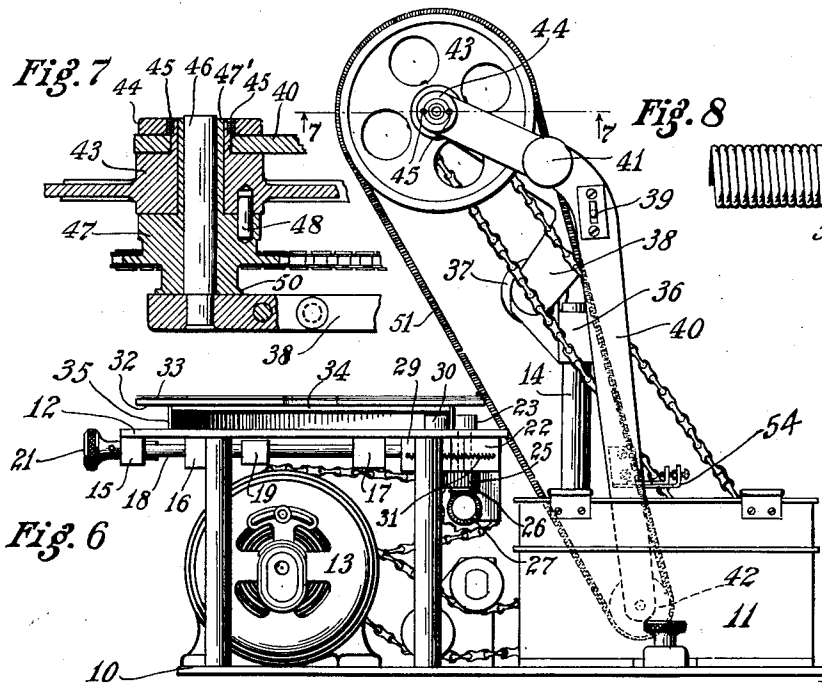


Fig. 6



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UNITED STATES PATENT OFFICE.

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OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

EDGE-COATING METHOD AND APPARATUS.

Application filed August 1, 1921. Serial No. 488,804.

To all whom it may concern:

Be it known that I, FRANK J. MACDONALD, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Edge-Coating Method and Apparatus, of which the following is a specification.

This invention relates to methods and apparatus for applying a liquid or semi-liquid substance such as rubber cement to the edge or margin of an article such as a piece of rubber-shoe stock.

Heretofore, so far as I am aware, this work, with regard to cementing shoe stock, has been performed entirely by hand, the cement being applied with a brush to a batch of stock pieces arranged in overlapped relation. My chief object is to provide an improved method and automatic apparatus, whereby said substance may be evenly and rapidly applied, although the article be of irregular form, and an improved product obtained. A further object is to avoid waste and misapplication of the substance. Another object is to provide apparatus for rapid operation upon successive articles, especially articles of substantially the same shape.

Of the accompanying drawings:

Fig. 1 is a plan view of a preferred embodiment of my invention, with the work in place.

Fig. 2 is a side elevation of the same.

Fig. 3 is a vertical section through the cement tank, on line 3—3 of Fig. 1.

Fig. 4 is a face view of the adjustable belt scraper.

Fig. 5 is a plan view, with parts broken away, showing the work-driving means and its adjustment.

Fig. 6 is a side elevation similar to Fig. 2, showing the parts in different operative positions.

Fig. 7 is a horizontal section on line 7—7 of Fig. 6, looking upward, as indicated by the arrows.

Fig. 8 is a side view of a part of the endless, cement-carrying belt.

Referring to the drawings, 10 is a base, upon which are mounted a cement tank 11, a work-supporting table 12, a motor 13 and a standard 14 supporting a cement carrying mechanism presently to be described. Secured to the under side of the

table 12 are guide brackets 15, 16, 17 for a pair of bars 18, 18 connected by a cross-piece 19 through which is threaded a feed-screw 20 swiveled in the guide-bracket 15 and provided with a hand-knob 21, for moving said bars in said guide-brackets to position the work. Secured to the inner ends of said bars is a block 22 on which is journaled, on a vertical axis, a roller 23 extending upward through a slot 24 formed in the table 12 and secured on a common shaft with a gear 25 below the block 22, adapted to be driven, by beveled gears 26, 27, a jointed drive shaft 28 and other connections shown, from the motor 13. 29 is a block slidably mounted upon the bars 18, and 30 is a roller loosely journaled on said block, extending upward through the slot 24 of the table 12, and adapted to be held against the roller 23 by tension springs 31, 31 connecting the blocks 22 and 29, and to be driven by a gear 30^a (Fig. 2) meshed with the gear 25. Said blocks may be made in sections, as shown, to facilitate the mounting of the rollers thereon.

Upon the table 12 is a work-carrier comprising a plate 32 the outline of which conforms substantially to the outline of the margin of the work to be cemented, consisting in this instance of formed pieces of shoe lining fabric, a stack of which, 33, are shown mounted upon said plate. Secured to the under side of the plate is a block 34, a part of the edge of which runs parallel with the margin of the work which is to be cemented, and said block is bordered on all sides but one by a vertical metal strip or flange 35. Said metal strip 35 is adapted to rest upon the table 12 to support the work carrier, and to be driven, between the rollers 23, 30, to feed the work, the work carrier sliding upon the table 12.

The mechanism for carrying cement from the tank 11 and applying it to the work comprises a bracket 36 secured upon the standard 14 and adjustably supporting, by a thumb-nut 37, an arm 38 formed in this instance with an elbow at which is supported, by a spacer bar 39, an arm 40, the latter being readily removable by turning the spacer bar 39 to unlock it from said arm, the latter being provided with a hand-knob 41 for convenience in removing it. Journaled at the respective ends of the arm 40 are grooved belt pulleys 42, 43, the hub

of the latter, 43, being retained in a bearing formed in the end of the arm by a collar 44 secured to said hub by screws 45, 45. Secured to the outer end of the arm 38 is an axle 46, (Fig. 7) upon which is journaled a sprocket 47 adapted to be driven from the motor 13, the hub of said sprocket being extended as a bushing 47' upon the axle 46 and adapted to receive the hub of the belt pulley 43. A dowel pin 48 is provided between the respective hubs of the sprocket 47 and the belt pulley 43, and a keeper 49 (Fig. 1) secured upon the arm 38 extends over a flange 50 (Fig. 7) upon the hub of the sprocket 47 to keep the latter in place upon its axle 46 when the belt pulley 43 is removed therefrom with the arm 40.

Mounted upon the pulleys 42, 43 is a cement carrying belt 51, which preferably consists of an endless helical spring with closely-spaced coils, as shown. A part of this belt is shown on a larger scale in Fig. 8.

The cement tank 11 preferably comprises two compartments, as shown, (see especially Fig. 3) one of them being adapted to receive the cement-carrying belt 51, and being narrow in order to expose as little of the cement to the atmosphere as possible, and relatively high in order to prevent the cement from overflowing or splashing out by reason of the disturbance created by the carrier belt 51. The other compartment preferably is relatively large, as shown, for holding a substantial supply of cement, and is completely covered to avoid undue evaporation of the solvent from the cement. The first mentioned compartment preferably is provided with a hinged cover 52 leaving only a sufficient opening for the arm 40 and carrier-belt 51. A depending partition 53 separates the two compartments but leaves them in communication with each other near the bottom, for the passage of cement, while preventing the circulation of air to the supply compartment.

Secured upon the arm 40 is a cement scraper (Fig. 4) adapted to remove excess cement from the belt 51, said scraper comprising a bracket 54 formed with a slot 55 through which the belt 51 runs with its inner side in contact with the end wall of said slot to scrape substantially all cement therefrom, and a forked plate 56 adjustably secured upon said bracket and adapted to straddle said belt to scrape excess cement from the outer side of said belt, which outer side is to be presented to the work, the crotch of said forked plate being so rounded as to leave different amounts of cement on the belt, especially along the middle line of the latter, according to the adjustment of said plate.

In the operation of the device, the hinged cover 52 of the cement tank 11 is opened

and the latter filled with cement, which is poured into the smaller compartment. The arm 38 and the parts carried thereby are set in appropriate position by means of the thumb-nut 37, with the belt 51, upon the pulley 42, extending into the cement. The stack of shoe parts 33 is mounted upon the plate 32, substantially in registry with the edges thereof, and the work carrier is slid upon the table 12 to start one end of the flange 35 between the rollers 23, 30, and, said rollers and the belt pulley 43 being driven, the work is fed past the cement carrying belt 51, the upper piece of stock having its edge in contact therewith and receiving therefrom an application of cement along the margin, the work carrier sliding upon the table and changing its position as the flange 35 passes between the rollers. When the last end of the flange has passed the rollers and the work carrier is thus freed, the operator removes the cemented, top piece of stock, and the operation is repeated to cement the next piece.

Deflection of the belt 51 under pressure of the work compensates for a substantial decrease in the height of the stack of pieces, and further decrease may be compensated from time to time by turning the screw 20 by the hand-knob 21. Lowering of the stack, or difference in the size of separate batches of stock, may also be compensated by adjustment of the arm 38, or said arm may be adjusted to keep the belt 51 running through the cement as the level of the latter is lowered in the tank 11.

The pulleys 42 and 43, with the arm 40, readily may be removed for cleaning, simply by turning the spacer bar 39 to unlock it from said arm.

The provision of a single pair of rollers for engaging and driving the flange 35 is of advantage over the three-point contact commonly employed in such work-feeding means, in that variations of curvature in said flange do not result in undue shifting of the axis about which the work-holder swings, or undue shifting of the cement-applying position.

The helical spring type of belt here shown is of advantage in that the spaces between adjacent coils hold substantial quantities of cement, and the elasticity of the belt permits the cementing of several sheets of stock without adjustment of the belt as a whole with relation to the work-support.

Various modifications may be resorted to without departing from the scope of my invention, and I do not wholly limit my claims to the specific embodiment here shown.

I claim:

1. The method of applying cement to the margin of a piece of sheet stock of curvilinear, non-circular form which comprises

moving said piece conformably to the shape of its margin to feed said margin past a fixed point and progressively applying the cement thereto as it passes said point.

2. The method of applying cement to the margins of successive pieces of sheet stock which comprises assembling a plurality of said pieces in a stack, moving said stack to move the margin of the outermost piece past a cementing position and applying cement progressively along said margin, removing said piece from the stack, and similarly cementing the next piece.

3. Apparatus of the class described comprising a work support mounted for turning a piece of sheet stock in its own plane, so as to feed its margin past a coating-applying position and a coating carrier movable across the edge of the work on said support in a direction non-parallel to the plane of the work.

4. Apparatus of the class described comprising means for moving the margin of an article in its own plane so as to feed said margin longitudinally past a coating-applying station, and a flexible, endless coating carrier movable transversely of and in contact with said margin.

5. Apparatus of the class described comprising means for moving a piece of sheet stock conformably to a margin thereof, of curvilinear, non-circular form, to feed said margin past a fixed point, and means for applying a coating to said margin as it passes said point.

6. Apparatus of the class described comprising a belt adapted adhesively to carry a coating substance, a tank adapted to submerge the lower portion of said belt, and means for turning an article to bring its surface progressively into contact with the exposed portion of said belt.

7. In apparatus of the class described, the combination of a coating carrier comprising a helical spring belt, and means for progressively presenting the edge of an article to said belt.

8. Apparatus of the class described comprising a rotary work-holding plate having on its lower side an open flange, a pair of rollers, including a driving roller, embracing said flange between them, and means for coating the margin of sheet stock supported on said plate.

9. Apparatus of the class described comprising a work-holder having on its lower side a curvilinear, non-circular flange, a

table slidably supporting said flange, and a single pair of rollers projecting upwardly past said table for driving said flange.

10. An edge cementing machine comprising means for feeding the margin of an article past a fixed point, an endless belt adapted adhesively to carry cement and to be drawn across the edge of the work to deposit cement thereon, and means for determinably varying the angle between the work and said belt.

11. An edge cementing machine comprising a belt adapted adhesively to carry cement, and a scraper for removing excess cement from said belt, said scraper comprising a pair of slotted members slidable with relation to each other to vary the size of the belt-passage formed by said slots.

12. An edge cementing machine comprising a belt adapted adhesively to carry cement, a pair of rollers adapted to drive the work past said belt, and means for adjusting said rollers from and toward said belt.

13. A cementing machine comprising a tank formed in two compartments in communication with each other at a low part thereof, one of said compartments being substantially shut off from the outer atmosphere, a work-support, and a traveling cement carrier partially immersed in the other compartment and having a working portion operatively related to said work-support.

14. In apparatus for feeding the margin of an article of irregular form past a fixed point and there operating upon said margin, the combination of a work-support having a curvilinear, non-circular drive-flange projecting therefrom, and a single pair of rolls, including a driving roller, said rolls being adapted yieldingly to embrace said flange and thereby drive said work-support.

15. In apparatus for feeding the margin of an article of irregular form past a fixed point and there operating upon said margin, a single pair of projecting work-driving rollers adapted yieldingly to embrace a flange-like projection for so feeding the margin of the article, and means adjacent said rollers for operating upon said margin as it is so fed.

In witness whereof I have hereunto set my hand this 28 day of July, 1921.

FRANK J. MacDONALD.