May 14, 1929. J. W. COSGROVE 1,712,604

TREATING FLEXIBLE SHEET MATERIAL

Filed April 27, 1922

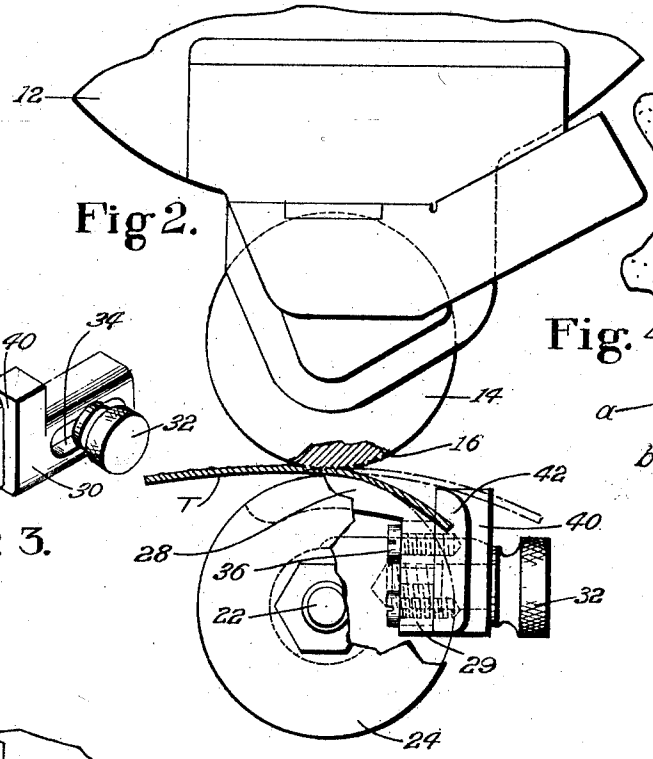


Fig 2.

Fig. 3.

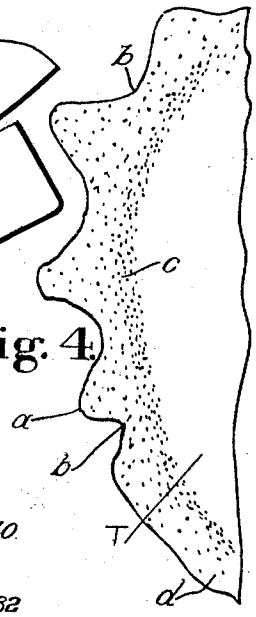


Fig. 4.

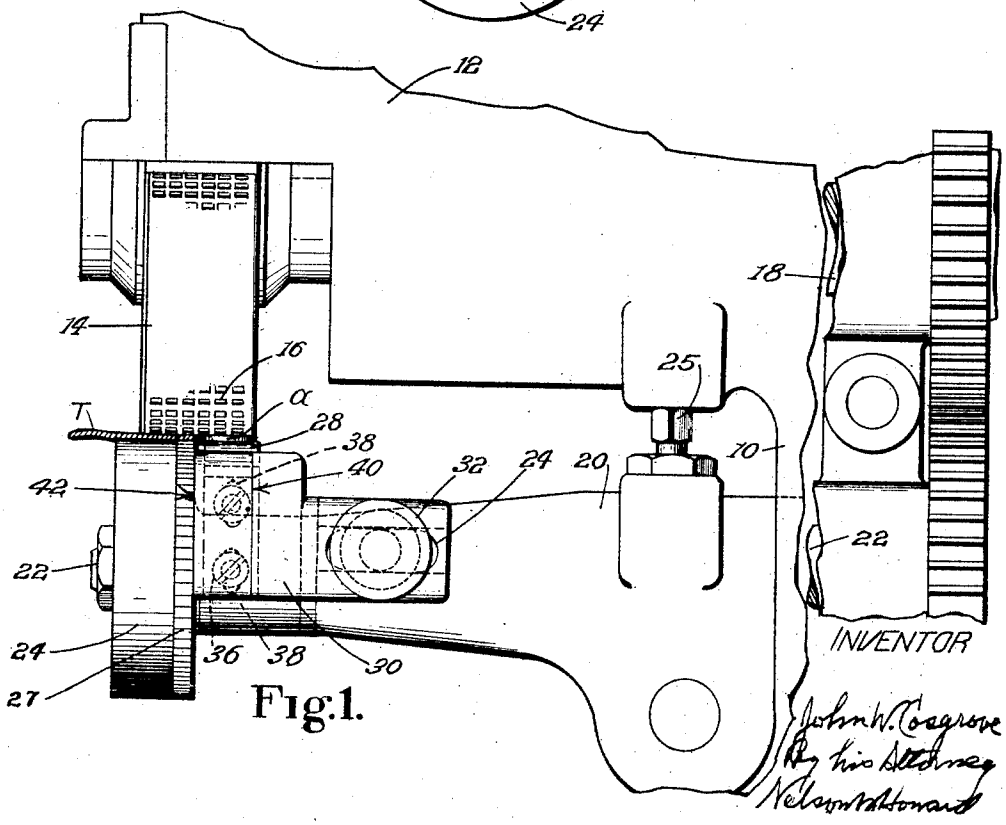


Fig.1.

INVENTOR

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UNITED STATES PATENT OFFICE.

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TREATING FLEXIBLE SHEET MATERIAL.

Original application filed April 27, 1922, Serial No. 556,870. Divided and this application filed March 25, 1927. Serial No. 178,435.

This invention relates to treating flexible sheet material such as is used in footwear, and more particularly concerns a method of applying adhesive to the tops or uppers of tennis or like rubber-sole shoes, the present application being a division of my co-pending application Ser. No. 556,870 filed April 27, 1922 which has resulted in Letters Patent of the United States No. 1,682,036 dated Aug. 28, 1928.

The tops of tennis shoes are sometimes formed with the edges about the toe-portions scalloped, so that the tops may lie more smoothly when lasted over the insoles, due to the absence of protuberances in the gathered-in material. In cementing such tops for their attachment to the insoles, it is desired that, adjacent to the scalloped portion, the work shall be coated over the full extent of the projections and over some of the adjacent material inside the bases of the projections, and that beyond these scallops the edge shall receive a band of the adhesive of less width. This operation presents difficulties, because the projections from the body of the material are easily displaced or twisted leading to their being stuck together in an undesired relation in which they will not properly extend over the insole in lasting. Then, too, an applying member operating over the projections will also act between them, and tend to deposit cement upon the usual co-operating pressure or work-supporting member. The last-mentioned tendency also accompanies the coating of the narrower area at each side of the scallops. This daubing of the pressure member piles cement up at the bases of the scallops, causing objectionably uneven coating.

Accordingly, an object of the invention is to devise a method of coating work which has projections from its body portion so that the work may be coated uniformly and without distortion. In the attainment of this object my novel method is characterized by the holding together of the coating member and a piece of work having the above described or similar characteristics in applying relation in such fashion that less pressure is applied over the projections than over the body of the work. The method, as applied to a scalloped shoe upper, is characterized by holding the shoe upper against a coating member with only a moderate pressure against the projecting parts of the scallops of the shoe upper and with a greater pressure against the adjacent area of the body of the shoe upper as a coating is applied thereto. Clearly enough, the feeding of a piece of work having the general characteristics of those herein under consideration could not be successfully accomplished by engagement of a feeding device with the projections of the scalloped portion and if the feeding device were to be arranged as is frequently the case in similar machines for treating flexible sheet material so that it engages the work near its edge, then, while it would be all right for the non-scalloped portion of the material, it would be entirely unsuitable for the scalloped portion. With these considerations in view, in another aspect, the method of treating flexible sheet material, such as is suitable for foot-wear, provided by this invention, involves feeding the material while a cementing operation is being performed on the edge portion thereof by applying force to the body of the material within the scalloped part of the material and closely adjacent to the non-scalloped part of the material in a path substantially parallel to the general direction of the edge. Thus, the invention is characterized by guidng a piece of flexible material with reference to one predetermined point during the treatment of a portion of the periphery of the material and by guiding it with reference to still another predetermined point during the treatment of another portion of the periphery of the piece of the material. This shifting of the work from one reference point to another may take place during the progressive treatment of the work so that the action is substantially continuous.

In the accompanying drawings, illustrating one way in which the method may be performed,

Figure 1 shows the improved cementing machine of my copending application, in front elevation;

Fig. 2 is an end elevation looking from the left in Fig. 1;

Fig. 3 is a perspective view of the gage and work-supporting finger; and

Fig. 4 illustrates a portion of a top which has been cemented in accordance with my novel method.

The method provided by this invention may be carried out by utilizing a machine similar to that disclosed in Letters Patent No. 1,682,036 to which reference has been made above. This has, supported upon a frame 10, a receptacle 12 for delivering cement or other adhesive to an applying roll 14. The applying surface of this roll may have projections 16 extending in series both circumferentially and laterally of the roll, between which projections are intermediate spaces, serving as pockets to hold the cement which is laid by the points of the projections upon the surface to be coated. The width of the applying surface of the roll 14 is sufficient so that it can apply cement to a width as great as that of any portion of the area to be coated. A piece of the work is indicated at T in Fig. 4 of the drawings, this being the toe-portion of the top of a tennis shoe. About it are projections *a* and curved depressions *b*, forming a series of scallops, which gradually decrease in depth from points near the forward extremity of the toe to positions at each side of the toe. The scalloped portion of the upper is thus bounded by the tips of the projections. The full height of these scallops is to be coated, and also a band *c* within their bases and along the adjoined body portion. This band, beyond the toe-portion, extends along the non-scalloped portion at each side of the top as indicated at *d* and is narrower than the width of the coating applied to the scalloped portion.

The applying roll 14 is fixed upon the outer end of a shaft 18 rotatable in the frame and driven from a suitable source of power. Pivoted upon the frame, below the shaft 18, is an arm 20, in which is rotatably mounted a shaft 22 also driven and having secured to it, beneath the roll 14, a pressure and work-supporting roll 24. This roll 24, having a knurled portion 27, is arranged to assist in feeding the work by force applied to the body portion along a path substantially parallel to the general direction of the edge of the material such that the scallops are avoided. The arm with the shaft and roll may be raised to bring the latter into cooperation with the applying roll by treadle or spring mechanism (not illustrated), the upward movement being limited by a stop-screw 25 carried by the arm and contacting with the overhanging portion of the frame. In the improved machine here shown, the roll 24, having its outer edge outside the corresponding edge of the applying roll 14, is arranged to underlie said roll 14 for a width substantially equal to the width of the coated area *d* upon the work and adjacent to the roll 24, at its inner side, is an associated pressure and work-supporting member, preferably consisting of a finger 28, which may be of cast metal or other rigid material, this finger having a supporting shank 29, from which it curves upwardly and rearwardly substantially concentrically with the periphery of the roll 24. Its width is here shown as substantially equal to the maximum depth of the scallops and is at least a substantial fraction of such depth. In the illustrated machine, this finger is mounted upon a block 30, which also furnishes a work-gage and which is carried by the arm 20. To this it is secured by a screw 32 passing through a horizontal slot 34 in the block and threaded into the arm. By this mounting the gage-block may be varied in its position with relation to the applying roll to change the width of the area to be coated. To the rear of the block the shank 29 of the finger is fixed by screws 36 passing through slots 38 in the shank and engaging the block. This slot-and-screw connection furnishes an adjustment for the finger toward and from the applying roll; but once the correct position is determined, this may remain unchanged. The proper location for the finger in the performance of the work for which this apparatus is particularly designed is just below the adjacent periphery of the supporting roll 24, so that the cement carried by the applying roll 14 will at all times be out of contact with the finger, and the work between the finger and applying roll will be subjected to less pressure than that portion between said applying roll and the supporting roll 24. Upon the block 30 predetermined gaging points are provided by two substantially vertical work-guiding surfaces 40 and 42, the former being nearly in vertical alinement with the inner edge of the applying surface of the roll 14, while the surface 42 is at the outer end of the block adjacent to the side of the roll 24. The distance between the guiding surface 40 and the outer edge of the applying roll corresponds to the maximum width of the area to be coated, including the projections and the band *c* within them. When the surface 42 is employed as a guide, the space coated is that indicated at *d*.

In using the illustrated machine for carrying out my novel method the operator may start at the heel-portion of the top, and position this portion of the edge of the work with reference to one predetermined point,

such as the gage surface 42. As he guides the outer edge of the work against this or in vertical alinement with it, he advances the end of the work between the rolls 14 and 24, which, in their rotation, feed it forward, the former applying to it a coating of cement from the receptacle 12 to cover the area *d*. In this connection, the finger 28 is inactive, being beyond the edge of the work, but is sufficiently removed from the cement-laden surface of the roll 14 so that it is not daubed by it. As the scalloped portion at the toe is approached, the operator shifts the work laterally between the rolls without stopping the machine so as to guide this portion of the edge of the work by positioning the tips of the projections with reference to another predetermined point such as the gage surface 40. When the other side portion *d* is reached, the work is again shifted and guided by the gage 42.

At this time, both the roll 24 and the finger 28 are effective to maintain the material in engagement with the applying roll, the projections of the scallops being held with so little pressure against the applying roll that they are not displaced, and the separation between the applying roll and the finger keeping the latter clean during the passage of the depressions *b*. Having rounded the toe-portion, the work is again moved laterally during its progressive treatment to utilize the surface 42 as a guide and complete the coating of the narrower area *d* at the opposite side.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The method of coating with adhesive sheet material having projections from a body-portion, which consists in feeding the sheet material relatively to a coating member in coating applying relation thereto with less pressure applied to the projections to hold them in coating applying relation to the coating member than is applied to the body of the work for the same purpose.

2. That improvement in methods of applying a coating of adhesive to the projecting parts and to the adjacent periphery of the body-portion of a shoe upper having a scalloped edge which comprises holding the shoe upper against a coating member with only a moderate pressure against the projecting parts of the scallops of the shoe upper and with a greater pressure against the adjacent area of the body of the shoe upper as a coating is applied thereto.

3. That improvement in methods of treating flexible sheet material, a part of the edge of which is scalloped, and is thereby provided with alternative indentations and projections of which the latter extend beyond the body of the piece of material, and a part of the edge of which is free from scallops, characterized by applying cement to the margin of said scalloped material while holding the projections against the coating member with only a moderate pressure, and feeding the material, while the cementing operation is being performed on the edge portion thereof, by force applied thereto in a path substantially parallel to the general direction of the edge of the material, closely adjacent to the edge of the non-scalloped part of the material but removed from the edge of the scalloped part of the material sufficiently to avoid said projections and indentations.

4. The method of treating the edge portion of a shoe upper, a part of the edge of which is scalloped, and is thereby provided with alternate indentations and projections of which the latter extend beyond the body of the piece of material, and a part of which is free from scallops, as it is moved during the application of a coating thereto, which comprises guiding the shoe upper by positioning its edge with reference to one predetermined point when applying a band of coating material to the periphery of the unscalloped portion of the work, shifting the work, and then guiding it by positioning the tips of said projections with reference to another predetermined point when applying a band of coating material to the periphery of the scalloped portion of the work.

5. The method of coating sheet material having projections from the body-portion thereof, which consists in feeding the work relatively to a coating member in coating applying relation thereto with less pressure on the projections than on the body of the work.

6. The method of coating work having projections from a body-portion, which consists in holding a coating member and the work in applying relation with less pressure over the projections than over the body of the work.

7. The method of treating the edge portion of a piece of flexible material suitable for use in foot-wear as said piece of material is moved progressively past the treating device in accordance with which the action of the treating device with respect to different parts of the edge of the material is varied by guiding said material with reference to one predetermined point during the treatment of one part of the edge of the material and by shifting the work so as to guide it by reference to another predetermined point in treating another part of the material.

8. The method of treating the edge portion of a piece of flexible material suitable for use in foot-wear as said piece of material is moved progressively past the treating device in accordance with which the

action of the treating device with respect to different parts of the edge of the material is determined by feeding the work to give it a substantially continuous movement, guiding it during such movement by reference to one point, and shifting the work laterally during such continuous movement to bring the edge of the work into position so that it may be guided with reference to another gage point laterally displaced from the first point.

In testimony whereof I have signed my name to this specification.

JOHN W. COSGROVE.