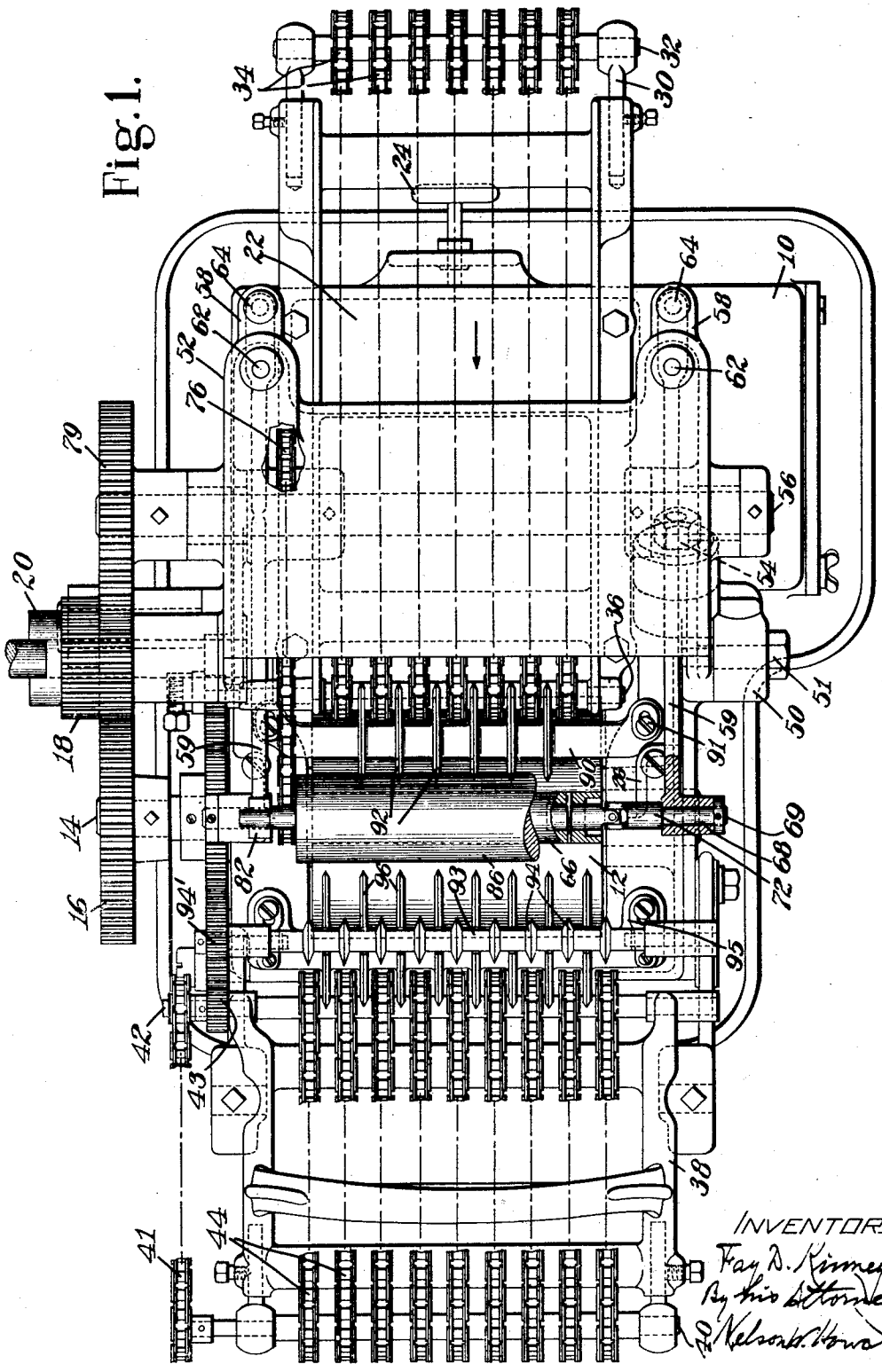
March 15, 1932. F. D. KINNEY 1,849,302

CEMENTING MACHINE

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Fig. 1.



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CEMENTING MACHINE

Filed Oct. 16, 1929 2 Sheets-Sheet 2

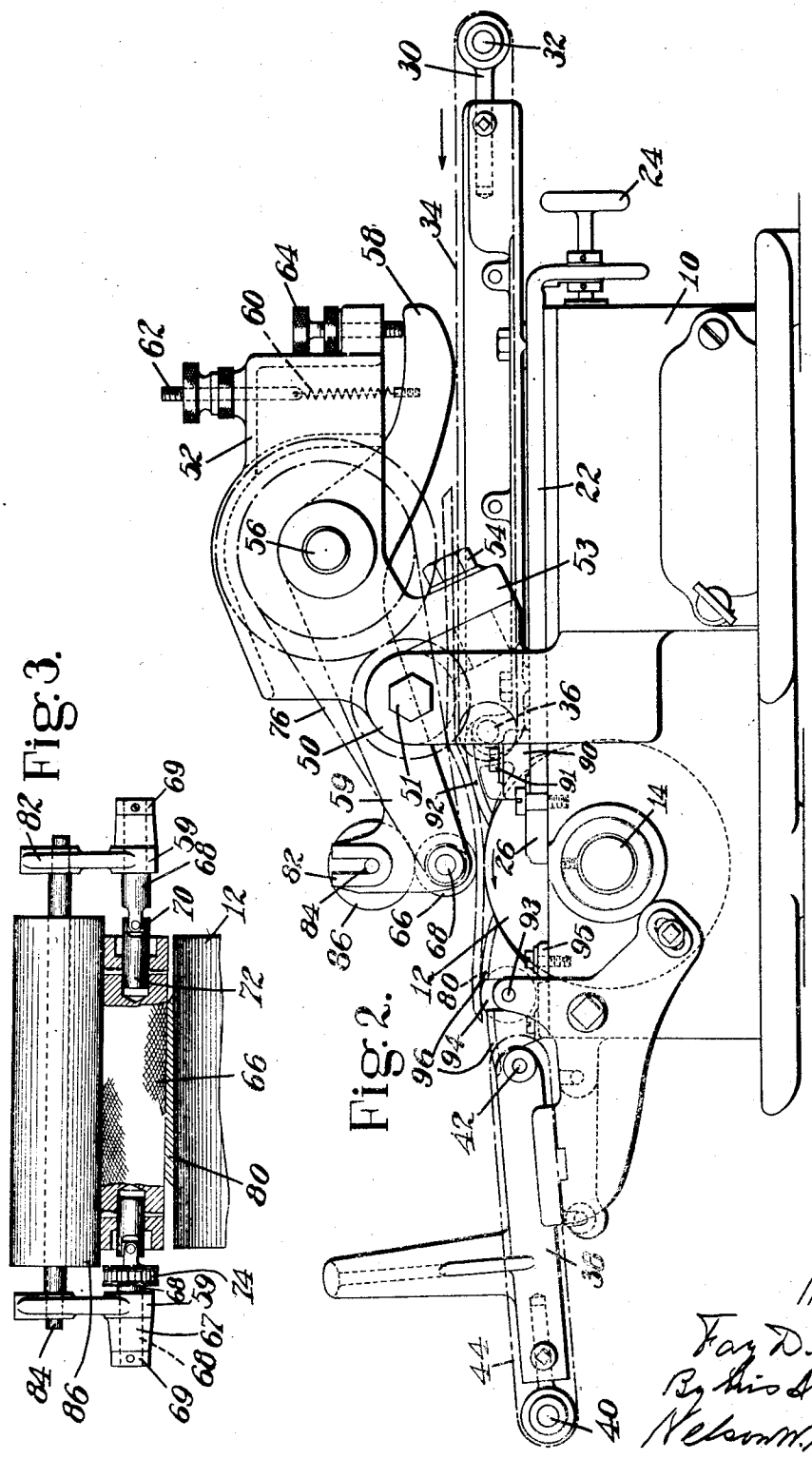


Fig. 2.

Fig. 3.

INVENTOR

Fay D. Kinney

By his Attorney

Nelson W. Howard

Patented Mar. 15, 1932 1,849,302

UNITED STATES PATENT OFFICE

FAY D. KINNEY, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY

CEMENTING MACHINE

Application filed October 16, 1929. Serial No. 400,132.

This invention relates to machines for coating sheet material. One important field of use for such machines is in applying cement to parts of boots and shoes, and for purposes of illustration my invention will be disclosed in its application to such machines.

Under present manufacturing conditions it is desirable to perform the various cementing operations incident to the manufacture of boots and shoes, especially rubber sole shoes, automatically at a high rate of speed and in such a manner as to require little or no skill on the part of the operator. On the other hand, it is increasingly important that the cement shall be applied accurately and uniformly cover the entire area to be cemented and that the machine may be relied upon to produce a high quality of coating regardless of variations in the individual blanks being cemented. An uncemented patch in the area which should be covered is likely to impair the finished shoe to such an extent that it can be disposed of only as a second at no profit to the manufacturer. The object of the present invention is to provide an improved machine capable of producing work with a coating of the highest quality and requiring on the part of the operator no greater skill than is required to present the successive blanks to a conveyor or other machine feeding device.

A class of work presenting considerable difficulty in the application of an accurate coating comprises rubber soles, these being limp, partially vulcanized pieces of substantial body and frequently varying in thickness from one side to the other. In attempting to cement such soles using machines heretofore available, the soles delivered exhibit from time to time narrow stripes or zones uncoated or imperfectly coated because of improper presentation of such areas to the cement applying member of the machine. These difficulties are overome in accordance with an important feature of my invention by the employment of novel supporting means for a feeding roller arranged to engage the work yieldingly between itself and the cement applying roll, together with means for driving the feeding roller at approximately the same peripheral speed as the applying roll, which roller supporting means are constructed and arranged to permit independent angular displacement of the ends of the roller without disturbing the efficiency of its driving connection so that the roller may accommodate itself accurately to the contour of work of uneven thickness.

While the precise manner of mounting the feed roller is of secondary importance only, the illustrated construction provides means for independently supporting it at each end by means of a universal joint and to utilize one of said joints for driving the roller in the manner required. Such construction permits easy displacement of the ends of the roller by different amounts and leaves the roller free to assume whatever angular position is best adapted to the contour of the particular sole being cemented without unduly squeezing or distorting the sole. It comprises, moreover, a compact mechanical construction which may be incorporated advantageously in the general organization of cementing machines and may, accordingly, be advantageously combined with the work feeding and guiding mechanism thereof. It, moreover, permits independent adjustment both of the initial position and of the initial pressure of each end of the feed roll separately.

Another feature of my invention consists in a novel work transferring member for assisting the presenting conveyor in the proper presentation of the sole or other blank to the cement applying roll or its delivery therefrom. It is desirable to guide the blank in a path substantially tangent to the applying roll and to avoid the possibility of permitting the blank to wrap around the roll and so be carried into the cement reservoir. This difficulty is avoided and the proper presentation of the blank insured by employing in the illustrated machine a work guiding member comprising an elongated bar having a series of thin spaced ribs disposed at right angles to the bar and shaped to extend substantially into contact with the periphery of the applying roll. These ribs are alternated or inter-

digitated with the chains of the presenting conveyor and thus afford a series of parallel supporting lines which control the movement of the blank and leave the cement coating thereon substantially unaffected.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings, in which

Fig. 1 is a plan view of the machine with certain parts broken away;

Fig. 2 is a view in side elevation, certain parts being indicated diagrammatically; and

Fig. 3 is a view in elevation, partly in section, of the feeding roller and associated parts.

While the illustrated machine is designed particularly for cementing rubber soles upon one surface, it will be understood that the invention is of broader application and not restricted to the treatment of soles or of any other particular type of work.

The machine frame 10 is shaped to provide a tank or reservoir for cement in which is mounted a cement applying roll 12 of relatively large diameter fast to a transverse shaft 14. The shaft 14 is journaled in the frame at the sides of the reservoir and provided at one end with a gear wheel 16 meshing with a pinion 18 upon the main shaft 20 of the machine. A cover plate 22 is mounted in the frame and formed at its rear edge as a scraper cooperating with the roll 12 to regulate the amount of cement carried up by it from the supply in the reservoir. This cover plate 22 is adjustable longitudinally by means of an adjusting screw 24. A pair of end scrapers 26 are provided for engaging the ends of the roll 12 and keeping them clean of cement. It will be understood that the roll 12 is rotated slowly in a counter clockwise direction as viewed in Fig. 2, carrying with it a coating of cement which is transferred and applied to the surface of work passed across the top of the roll.

The work to be cemented is presented to the roll by a conveyor comprising a series of endless sprocket chains 34 mounted to move in spaced parallel paths. The chains are carried by a series of sprocket wheels mounted respectively on a transverse shaft 36 journaled in the machine frame and driven through geared connections with the shaft 14, and by sprocket wheels on a shaft 32 mounted in adjustable bearing arms 30 projecting forwardly from the machine frame.

The cemented work is carried away from the applying roll 12 by a similarly constructed delivering conveyor, comprising parallel sprocket chains 44 running upon a series of sprockets carried respectively by a shaft 42 journaled in the inner end of a frame 38 bolted to the machine frame and a shaft 40 journaled in adjustable bearing pieces projecting from the rear end of the frame 38. The shaft 40 is provided with a sprocket wheel at its outer end and driven by a sprocket chain 41 from a sprocket wheel on the shaft 42. The shaft 42 carries a pinion driven also through geared connections with the shaft 14. The conveying mechanism above described is not herein claimed as it is claimed in Letters Patent of the United States No. 1,800,510, granted April 14, 1931, upon the application of J. W. Cosgrove.

The machine frame is extended upwardly at either side to form posts 50 through which extend studs 51 upon which is journaled a forked casing 52 having a downwardly extending arm 53 secured to the frame by a bolt 54. Between the walls of the casing extends a shaft 56 upon which is journaled a carrier comprising a pair of separate independently movable levers, each having a forwardly extending arm 58 and a rearwardly extending arm 59. Each of the arms 58 is connected to a tension spring 60 which, in turn, is connected to an adjustable threaded pin 62 mounted in the casing 52. Adjustable stop screws 64 project through bosses on the casing 52 and bear against the arms 58 so that the angular position of each arm in the casing 52 may be variably determined by the setting of these stop screws, while the levers are left free to swing away from them against the tension of the springs 60 for a purpose to be later described.

Between the ends of the arms 59 of the carrier is mounted a driven feed roller 66 of relatively small diameter and having a knurled surface. Each arm 59 is provided with an outwardly extending boss 67 in which is rotatably mounted a stud 68 having a collar 69 pinned to its outer end to prevent longitudinal movement in one direction, and shouldered to prevent movement in the other direction. Each of the studs is forked at its inner end and provided with a pivoted block 70 which is slidably received in the forked end of a stud 72 inserted in the end of the roll 66 and pinned in place. The studs 68 and 72 and the pivot block 70, accordingly, constitute a universal joint for supporting each end of the roller 66 which is extensible by reason of the sliding connection between the block 70 and the stud 72 to permit displacement of the ends of the roller as the latter assumes various angular positions. The left-hand stud 68, as shown in Fig. 3, is provided with a sprocket wheel 74 upon which runs a sprocket chain 76 driven from a sprocket wheel on the shaft 56. The shaft 56 has a gear wheel 79 which meshes with the pinion 18 on the main shaft of the machine. This driving connection is so designed as to rotate the feed roller 66 at substantially the same peripheral speed as the cement applying

roll 12 and in such direction that its lower surface moves in the same direction as the upper surface of the roll 12.

As the springs 60 tend to swing the levers of the carrier always in a counter clockwise direction, the roller 66 is urged at all times yieldingly toward the applying roll 12. It thus presses the work yieldingly against the cement applying surface of the roll and, on account of the universal joints above described, is free to accommodate itself angularly to interposed work which may not be uniform in thickness. Such a condition is illustrated in Fig. 3, where a sole 80 is shown in cross section as positioned between the roller 66 and the cement applying roll 12. In this case, the sole tapers toward its right-hand side and, therefore, the roller 66 has assumed a slightly inclined position in which it bears fairly across the entire width of the sole and, consequently, holds its lower surface with a uniform pressure in contact with the roll 12. By reason of the limiting stops 64, the initial position of the roller 66 can be predetermined and maintained in such a relation to the applying roll 12 that cement can never be transferred directly from the applying roll 12 to the feed roller 66.

Each of the arms 59 of the carrier is provided with an upright forked extension 82 providing upright slots in which is journaled a shaft 84 carrying an idle roll 86 arranged to rest upon the feed rollers 66 and to be rotated by it. The roll 86 is a cleaning roll and may be of wood or any other suitable material for removing cement accidentally reaching the feed rollers 66. It will be apparent that the open bearings for the shaft 84 permit the roll 86 to follow any angular position which may be assumed by the feed roller 66.

In order to fill in the space between the ends of the conveyors and the cement applying roll 12 and guide the work from one to the other, I provide novel guide members which will now be described. A transverse bar 90 is adjustably mounted between the sides of the machine frame by screws 91 and provided with a series of thin upstanding ribs 92. The ribs are disposed so that they alternate in position between the sprockets of the conveyor chains 34, being therefore interdigitated with said chains, and extend from points between the chains into close proximity to the surface of the roll 12. The action of the ribs in guiding the work from the conveyor to the roll is indicated in Fig. 2, where a sole 80 is shown in cement receiving position.

At the rear side of the roll is mounted a driven shaft 93 having a series of tapering disks 94 spaced longitudinally thereof in position opposite to the chains 44 of the delivering conveyor. The shaft 93 is provided with a pinion 94′ at its outer end, which is driven through geared connections with the shaft 14. Beneath the shaft 93 is adjustably mounted a bar 95 provided with a series of thin upstanding ribs 96 spaced so as to alternate with the chains 44 of the conveyor and each provided in its upper edge with a U-shaped recess for receiving the shaft 93. The ribs 96 are tapered at their upper edge so as to support the cemented work in a series of spaced lines and not to interfere with the distribution of cement thereon. These ribs 96 lie substantially in a plane just below the top edges of the disks.

The operation of the machine will be clear from the foregoing description but may be summarized for convenience as follows. The reservoir is filled with cement to such a point that the lower portion of the cement applying roll dips below its surface and carries up in its rotation a film or coating of cement. The operator places the successive soles to be cemented upon the chains 34 of the presenting conveyor and without further attention on his part they are advanced into the machine across the ribs 92 of the forward guide member and between the applying roll 12 and the driven feed roller 66. The latter, as already explained, is free to yield upwardly at either end against the tension of the spring 60 and to assume whatever angular position the contour of the work requires, so that the lower face of the sole is pressed into continuous engagement with the cement applying surface of the roll 12 and the cement is transferred uniformly to the surface of the sole. As the sole leaves the cement applying point, it passes over the stationary ribs 96 of the rear guiding device and reaches the sprocket chains 44 of the discharging conveyor, by which it is carried from the machine, and is ready for further operations in the manufacture of the shoe.

While the invention has been herein disclosed in its application to a machine for applying cement to parts of boots and shoes, it will be understood that many of its features may be embodied with advantage in machines for applying coating of any kind and to blanks other than shoe parts.

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

1. A cement applying machine having, in combination, a driven cement applying roll, and work feeding means including a roller of less diameter than the applying roll supported adjacent thereto by universal joints, means for driving said roller at approximately the same peripheral speed as said applying roll, and a floating cleaning roll contacting with said feeding roller in all positions and rotated by said roller.

2. A cement applying machine having, in combination, a driven cement applying roll, means for guiding the work to said roll, a carrier having separately pivoted arms ex-

tending adjacent to the roll, a driven feed roller disposed between said arms, and a universal joint at each end of the roller permitting angular displacement thereof to accommodate work of non-uniform cross section.

3. A cement applying machine having, in combination, a cement applying roll, a driven feed roller normally pressed toward said roll, and independently movable supports for the opposite ends of the roll permitting them to be displaced different distances from the surface of said cement applying roll by the passage of work of uneven thickness.

4. A cement applying machine having, in combination, a cement applying roll, an adjustable carrier comprising independently adjustable arms extending toward the roll, a stud rotatably mounted in each arm and carrying at its inner end a pivoted block, one of the studs carrying also means whereby it may be rotated, and a roller interposed between said studs and slidably connected at either end to said pivoted blocks.

5. A cement applying machine having, in combination, a cement applying roll, an elongated driven feed roller of relatively small diameter yieldingly pressed toward said roll and mounted to be angularly displaced by work of uneven thickness, and a freely rotatable cleaning roll resting loosely by gravity upon said feed roller and arranged to follow the angular displacement of the roller.

6. A cement applying machine having, in combination, a cement applying roll of relatively large diameter, independent pivotally mounted arms extending toward said roll, means for variably limiting movement of said arms to control the position of the carrier and means for urging said arms toward the roll, an elongated feed roller of relatively small diameter disposed between said arms and connected thereto at either end by a universal joint, and means movable with the carrier for driving said feed roller through one of said joints at substantially the same peripheral speed as the cement applying roll.

7. A cement applying machine having, in combination, a cement applying roll, a conveyor comprising spaced movable endless members for advancing work to the roll, and a stationary work supporting member disposed between the roll and the conveyor having a series of spaced ribs projecting in one direction between the endless members of the conveyor and extending in the other direction into proximity with the surface of the roll.

8. A cement applying machine having, in combination, an applying roll, a conveyor comprising spaced movable endless members for advancing work to the roll, and a stationary work guiding member extending across the face of the roll and having ribs interdigitated with the endless members of the conveyor and extending at right angles to the axis of the roll to support the work in its passage from the conveyor to the roll.

9. A cement applying machine having, in combination, an applying roll, and means for guiding the work with respect thereto comprising a shaft having a series of spaced disks thereon and a grid formed of a series of parallel ribs spaced alternately with respect to the disks, and having the upper surface of each rib cut away to receive the shaft with the peripheries of the disks located just above said ribs.

10. In a cementing machine a work guiding member comprising an elongated bar having a series of thin upstanding ribs disposed at right angles and spaced along the bar forming a nearly flat supporting grid, the upper surface of each rib being cut away at a point between the ends of the rib to present a U-shaped recess in its upper edge.

11. A cement applying machine having, in combination, a cement applying roll, and work feeding means including a driven roller disposed adjacent to the applying roll, pivoted carrier arms yieldingly and rotatably supporting the ends of the roller with a universal joint interposed between each arm and the roller, and independently adjustable means for regulating the pressure of each arm.

12. A cement applying machine having, in combination, a cement applying roll, a feeding roller disposed adjacent thereto, a carrier arm connected to each end of the roll through a universal joint, means movable with one arm for driving the roll, means for adjusting the limiting position of each arm independently of the other to control the initial position of the feeding roller with respect to the applying roll, and means for maintaining each arm under yielding pressure toward the applying roll.

13. A cement applying machine having, in combination, a cement applying roll, a driven feed roll cooperating therewith and being independently supported at each end so that it may assume different angular positions corresponding to the contour of the work, arms having upright slots adjacent to the ends of the feed roll, and an idle cleaning roll having an axle loosely guided in said slots, said cleaning roll being arranged to run on the surface of the feed roll in all angular positions thereof.

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

FAY D. KINNEY.