T. QUINN.

BEADING CEMENTER.

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991,369.

Patented May 2, 1911.

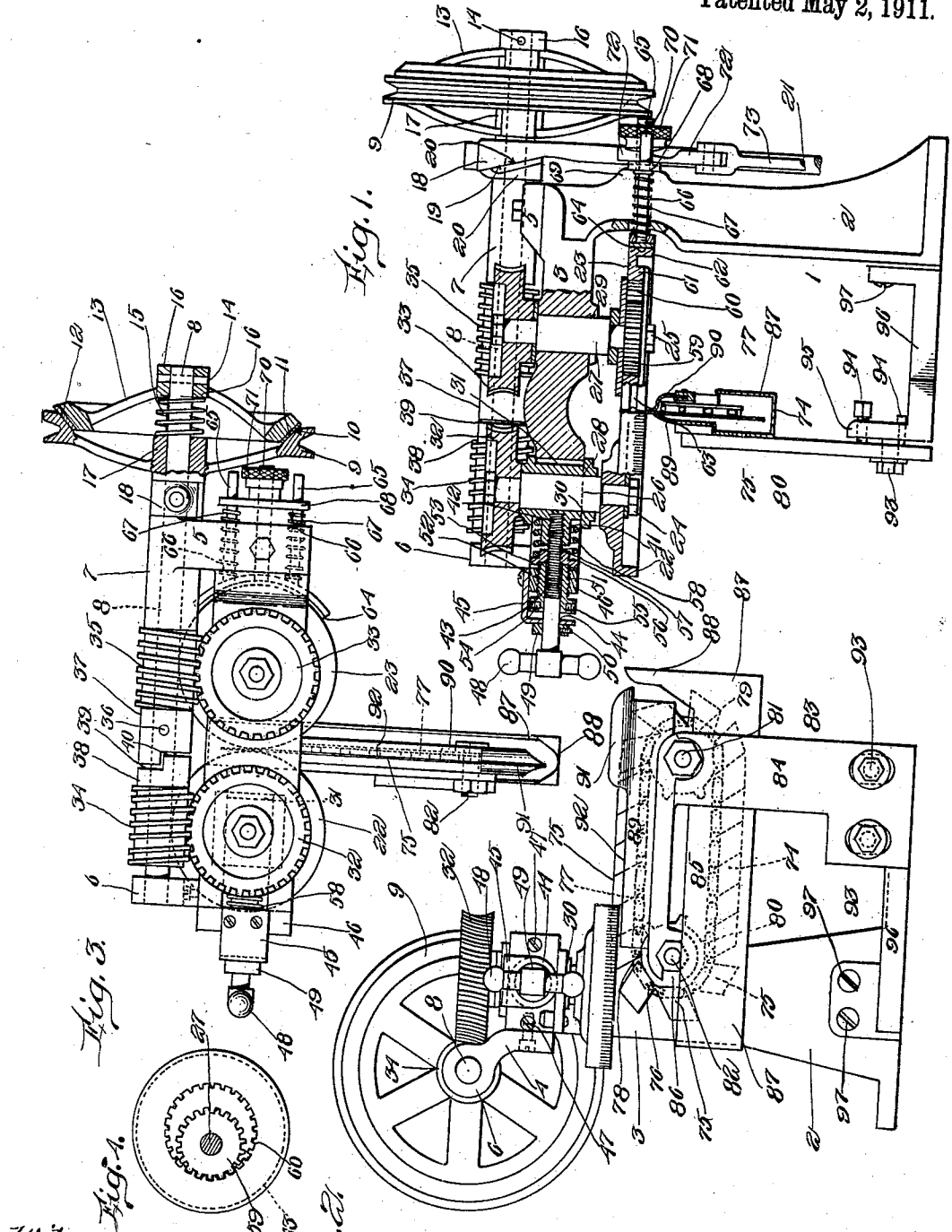

Fig. 1.

Fig. 3.

Fig. 4.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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BEADING-CEMENTER.

991,369. Specification of Letters Patent. Patented May 2, 1911.

Application filed March 11, 1910. Serial No. 548,623.

To all whom it may concern:

Be it known that I, THOMAS QUINN, a citizen of the United States, residing at Milford, in the county of Worcester and State of Massachusetts, have invented an Improvement in Beading-Cementers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to upper folding machines and more particularly to an upper folding machine for folding and pressing the upper edges of the tops or uppers of boots and shoes, this operation being generally known as "beading."

As is well known to those skilled in this art, the upper edge of the top or upper and the mating edge of the lining or top facing are laid against each other with their outer surfaces in contact and are then stitched together by a seam running close to and parallel with the edge. After the sewing operation the upper and the lining or facing are turned, so as to bring their finished or outer surfaces upon the outer side, and a fold, bend or crease is formed in each, that in the upper being somewhat above the folded edge of the lining or facing, and thereafter the folded edges are pressed to set the folds and cause the cement or other adhesive which was applied to the inner surfaces to adhere, thus producing a "beaded" or finished edge about the upper edge of the shoe top, hence this operation has become known in the art as "beading." It is such a pressing or beading machine therefore which forms the subject matter of my invention, and it has for its objects to produce such a machine having improved means for supporting and feeding the work, and to improve the work-pressing rolls and their operating mechanism, and also to produce such a machine in which the cement or other adhesive, will be automatically applied to the inner surfaces of the folded edges after the parts are turned instead of before turning as is now the practice.

Further objects of the invention will be set forth in the following specification.

With the foregoing objects in view my invention consists of an upper folding or beading machine comprising folding or beading mechanism with a movable horn or work support for supporting and feeding the work to the pressing means.

It further consists of means whereby said work support applies cement or other adhesive to the inner surfaces of the folded edges, and further, of the devices and combinations of devices which will be hereinafter described and claimed.

My invention is set forth in the accompanying drawing in which:—

Figure 1, shows the machine in front elevation; Fig. 2, shows a top plan view; Fig. 3, shows an end elevation with parts shown in longitudinal vertical section on two lines, one passing through the shafts of the pressing and beading rolls, and the other transversely through the work-supporting horn and cement receptacle; and Fig. 4 is a plan view of the left-hand roll.

Similar reference characters will be employed to designate corresponding parts.

In the drawing, 1 indicates the main frame comprising a vertical standard 2 and an overhanging arm 3 extending at substantially a right angle to the standard 2, and as indicated in the drawing, these parts may be formed as an integral casting.

Fixed to the overhanging arm 3 are the brackets 4 and 5, which carry to one side of said arm 3 and a little higher than said arm, the bearings 6 and 7 in which is mounted to rotate, the main shaft 8. This shaft 8 has at one end a loosely mounted belt pulley 9 arranged to be constantly driven by a belt leading from any suitable source of power, and this pulley 9 is designed to be connected to, and to drive, the main shaft 8 at such times as may be desired by the operator, to impart motion to the pressing and beading rolls of the machine, by any suitable form of clutch mechanism. As shown in the drawing, the pulley 9 is arranged to turn loosely on the shaft 8 and also has a slight movement along said shaft. On one side it carries a beveled clutch face 10 arranged to engage a mating beveled clutch face 11 (which may have a friction surface 12,) of a clutch wheel 13. fixed as by a pin 14 to the end of the shaft 8. The clutch faces 10 and 11 are normally held out of engagement with each other by a spring 15 which surrounds the shaft 8 and bears at one end against the hub 16 of the clutch wheel 13 and its opposite end against

the hub 17 of the pulley 9, the said spring acting to move the pulley 9 slightly along said shaft 8 to disengage the clutch faces 10 and 11. A yoke or frame 18 sliding vertically between an end of the hub 17 of the pulley 9 and the beveled faces 19 on the bearing 7, carries mating inclined or beveled faces 20, and when drawn down by means of the rod 21 and a foot treadle (not shown) acts to force the pulley toward the clutch, thus to lock the pulley to the shaft to rotate the shaft and cause the driving parts of the machine to operate.

While I have with some particularity illustrated and described the driving mechanism of the main shaft of the machine, and the means whereby its rotation may be started and stopped at the will of the operator, the same in and of itself forms no part of the present invention and the details thereof may be constructed and arranged in any other manner desired.

The beading and pressing mechanism of the illustrated embodiment of the present invention comprises the rolls 22 and 23 detachably supported as by the nuts 24 and 25 respectively, upon the lower ends of the vertical shafts 26 and 27, so that their peripheries shall be in horizontal alinement with each other. The shafts 26 and 27 are mounted to rotate in vertical bearings 28 and 29 respectively, the bearing 28 being formed in a movable block 30 fitting a slot 31 in the arm 3, while the bearing 29 is formed directly in the arm 3. At their upper ends the shafts 26 and 27 carry worm wheels 32 and 33 which mesh with and are driven by worms 34 and 35 mounted upon the shaft 8, the whole being so arranged that the revolutions of the shaft 8 will cause simultaneous revolutions of the vertical shafts 26 and 27 in opposite directions, thus to cause the peripheries of the pressing and beading rolls 22 and 23 to move in opposite directions. The rolls are beveled slightly to cause the leather to be pinched most at the crease or extreme top of the folded edge, which not only tends to make a better crease but prevents the stretching and crawling of one fold of the leather on the other.

The worm 35 is fixedly mounted upon the shaft 8 by means of a set screw 36 which passes through its hub 37, but the hub 38 of the worm 34 is designed to have a slight movement along said shaft 8 with relation to the hub and worm 37 and 35, but to insure that the worm and hub 38 shall partake of the rotating movement of the shaft 8 and the worm and hub 35 and 37, the respective hubs 37 and 38 are provided with the mating angularly disposed shouldered joints 39 and 40 respectively.

By the arrangement just described the beading and pressing roll 22 and connected parts are capable of separating from the beading and pressing roll 23 to accommodate any inequalities in the thickness of the material passing between said rolls.

It is desirable that the beading and pressing roll 22 be pressed forcibly but yieldingly toward the roll 23, and also that the force of the pressure may be regulated as desired, and that the normal position of the roll 22 with relation to the roll 25 may be adjusted to regulate and adjust the normal width of the space between the peripheries of said rolls, and in the machine of the drawing these adjustments are secured by the following described mechanism.

As before referred to, the block 30 is adapted to have a slight movement in a slot or bearing 31 in the forward end of the arm 3, and it carries upon its front end a projection or boss 41 threaded at 42 and engaged by a threaded rod 43 mounted in a bearing 44 carried by a down-turned bracket 45 fixed to the upper edge of a plate 46, which is fixedly secured by the screws 47 to the front of the arm 3. The outer end of the rod 43 is provided with a handle or cross head 48 by means of which it may be turned, and at the front of the bearing 44 in the bracket 45 the said rod carries a collar 49 which is adjustably mounted on the smooth part of said rod, as by means of a set screw 50, the said collar being in contact with the front of the bracket 45.

The plate 46 has a threaded bearing 51 in which is adjustably mounted a sleeve 52 which has external threads 53 mating with the threads of the bearing 51, whereby by turning said sleeve 52 it may be adjusted in the plate 46 to cause its inner end to project more or less from the inner face of said plate 46. The bearing in the sleeve 52 is smooth and the rod 43 may slide freely through the same. To turn said sleeve in its bearing and thus adjust it therein, it is provided at its outer end with a head or collar 54 provided with radially disposed sockets 55 which may be engaged by a spanner or other tool when it is desired to turn said sleeve. At the inner end of said sleeve 52 there is a collar 56 which loosely surrounds the rod 43, which collar carries a boss 57 of the collar 56, and the boss or projection 41 of the block 30 is seated at the end of a coiled spring 58 which forces the block 30, the shaft 26 and its beading and pressing roll 22 toward the beading and pressing roll 23.

By the arrangement just described provision is made for a yielding movement of the beading and pressing roll 22 toward and away from its companion roll 23, thus to accommodate the action of the rolls to any inequalities in thickness in a given piece of work, also the force with which the rolls act or the pressure, may be adjusted by turning the sleeve 52 in its bearing, thus moving the inner end out or in, as the case may be, with

relation to the inner face of the plate 46, to adjust the tension of the spring 58, and finally the normal relative position of the beading roll 22 with relation to the beading roll 23, or the space between them, may be adjusted by turning the rod 43, which by means of its threaded connections with the block 30 draws said block toward the left as the machine is shown in Figs. 2 and 3 of the drawing, or permits the spring to force it toward the right, dependent upon which way the rod is turned.

It is of course to be remembered that the driving mechanism of the roll 22, including the shaft 26, the block 30, the worm wheel 32 and worm 34, partakes of the adjusting movements of the roll 22, the shouldered joint 39 and 40 between the hubs 37 and 38 of the worms 34 and 35, insuring that such adjusting movements shall not interfere with the rotating movement of such roll as imparted by the shaft 8.

The beading roll 22 is connected directly to its shaft 26 so as to partake of its rotating movements, but the roll 23 is loosely supported upon the lower end of the shaft 27, above a gear or pinion 59 which is fixedly secured to said shaft, and which meshes with an internal gear 60 formed on a depending flange 61 of said roll 23 concentric with the peripheral flange 62, which, as shown, is provided with a groove 63 upon its outer surface to accommodate the folded edge of the seam which unites the lining or facing to the folded edge of the upper. The peripheral flange 64 of the roll 22 is knurled or milled and beveled as shown at 65 but the surface of the flange 62 of the roll 23 is smooth. The above arrangement is such that the roll 23 will revolve slower than the roll 22 and thus have an ironing or smoothing effect on the material, as well as a pressing effect.

A shoe 63 faced with some suitable material such as leather 64, is provided to be forced into contact with the peripheral flange 62 of the roll 23. This shoe is carried by rods 65 mounted in bearings 66 in the standard 2 of the frame, which rods are surrounded by coiled springs 67 which at one end bear against the shoe 63 and at their opposite end against a sliding cross-bar 68 on the outer ends of the rods 65, and at their other bear against a projecting lug 69 of the standard 2. Connected to the shoe is a central rod 70 which passes through the standard 2 and the cross-bar 68 and carries on its outer end an adjusting nut 71 threaded to said rod 70. Between the nut 71 and the cross-bar 68 is a sliding bar or wedge 72 which is raised and lowered by means of a treadle rod 73, moving up and down in timed relation with the rod 21 which controls the clutch of the main shaft. The arrangement is such that the downward movement of the wedge 72 forces the rod 70 toward the right as the machine is shown in the drawing, thus pulling away the shoe 64 from contact with the beading and pressing roll 23, while the upward movement of the wedge permits the springs 67 to move the shoe against the periphery of the beading and pressing roll 23.

By the arrangement of rolls and their driving mechanism as just described it will be noted that the material is acted upon by two rotating rolls one of which has a knurled or milled edge, and the other a smooth ironing or smoothing edge, and that because of the latter roll moving at a relatively slower speed than the other roll, a feeding of the material is accomplished, and at the same time a rubbing and smoothing action in the material, in addition to the pressing action due to the spring which forces the rolls together. Also the action of the rolls caused by the manner in which they are mounted and driven at different speeds, effectively prevents the creeping or twisting of the folded edge of the material as it passes between the rolls.

As machines of this type have been heretofore constructed, they were provided with a work support or horn upon which the folded or beveled edge of the upper was supported and from which it was drawn by the action of the rotating rolls, and in operation it was found that the work was liable to become disarranged or distorted between the end of the work support and the bite of the rolls, which resulted in a distorted and twisted and uneven edge which had to be done over again before the work could pass to the sewing machine which stitched the turned and folded edge of the upper and the lining or facing, to produce the desired beaded effect. This difficulty arose from the necessity of placing the end of the stationary or fixed horn or work support at some distance from the bite of the beading and pressing rolls. In the present invention I have provided a moving horn or work support so constructed and arranged that it will support the material and carry it to and deliver it right within the bite of the rolls, and thus any liability of the work becoming distorted or displaced before it is engaged by the rolls is entirely avoided.

As is shown in the drawing the horn or work support 74 consists of numerous blades 75, preferably rhomboidal in shape, and mounted at their lower or inner edges, as by means of rivets 76 to the links 77 of an endless chain 78. The chain 78 is mounted upon sprocket wheels 79 and 80 supported by short studs or shafts 81 and 82 at the upper end of a frame or stand 83, which stand has an upwardly extending stand 84 and a horizontally extending part 85. The part 85 is slotted at its forward end as at 86

so that the stud 82 may be adjusted toward and from the stud 81 to adjust the chain. As may be seen in Fig. 2, this endless sectional work support has its blades extending for quite a distance between the rolls 22 and 23, and in consequence the folded edge of the upper will be delivered directly to the bite of the rolls. The operator moves the work and the endless work support along, the blades 75 gradually separating and withdrawing from the work as the chain passes about the sprocket wheel 80, from which they pass downward and backward into and through a tank or trough 87 which is supported upon the stand 84 below the moving work support and which contains cement or other suitable adhesive. Thus the blades of the work support as they pass upward and about the sprocket wheel 79 will have a coating of cement or other adhesive which they deliver to the inner opposing surfaces of the upper and lining or facing as they enter between the same. At its rear end the trough 87 has an upwardly extending guard 88 covering the upwardly moving blades about the sprocket wheel 79. As the blades are separated from each other when they are rising upward about the sprocket wheel 79 and close together between the sprocket wheels, they would be liable to pinch the material in closing, to prevent which there are provided longitudinally extending guide plates 89 and 90 supported close to the path of movement of the blades, and which at their rear ends project above the upper edges of the blades as shown at 91 and forward of which they are below the edges of the blades as shown at 92. The projections 91 form supports upon which the operator may manipulate the parts of the upper, and lining or facing, to properly position them and the fold therein before moving the work forward onto the blades or work support.

The stand 84 is adjustably mounted, as by the screws 93 and 94, to a forwardly extending foot 95 of a bracket or arm 96 secured by means of screws 97 to the front of the stand 2.

In operation the upper, and lining or facing which have been stitched together and turned in the usual manner, are placed upon the guards 91 and thence moved along by the operator onto the upper edge of the blades 75 of the endless work support, upon which and with which the work is advanced to the action of the beading and pressing and folding rolls. The blades automatically take cement from the trough 87 and deliver it between the opposing faces of the upper, and lining or facing. As hereinbefore set forth the movement of the rolls is started and stopped at the will of the operator, and the action of the rolls 22 and 23 is such that the material is smoothed and ironed as well as pressed together to cause the cemented surfaces to adhere.

Having described the construction, organization and mode of operation of my machine, I claim as new and desire to protect by Letters Patent of the United States,

1. In a machine for beading shoe uppers, in combination, beading mechanism, a movable work support for supporting and guiding the work to the beading mechanism, and means for moving the work engaging portion of said beading mechanism to feed the work as it operates thereon, substantially as described.

2. In a machine for beading shoe uppers, in combination, beading and pressing rolls, means to rotate them in opposite directions, and a movable work support for supporting and guiding the work between the rolls, substantially as described.

3. In a machine for beading shoe uppers, in combination, beading mechanism, a movable work support comprising an endless carrier and a plurality of blades mounted on said carrier, and means for moving the work engaging portion of said beading mechanism to feed the work as it operates thereon, substantially as described.

4. In a machine for beading shoe uppers, in combination, beading mechanism, a movable work support comprising an endless carrier and a plurality of alined blades mounted on said carrier, and means for moving the work engaging portion of said beading mechanism to feed the work as it operates thereon, substantially as described.

5. In a machine for beading shoe uppers, in combination, beading rolls, means to rotate said rolls in opposite directions and a movable work support for supporting and guiding the material between the rolls, comprising an endless carrier and a plurality of blades mounted on said carrier, said blades entering between the rolls in a line at right angles to their axis of rotation and passing therefrom in a curved line, substantially as described.

6. In a machine for beading shoe uppers, in combination, beading rolls, mechanism to rotate said rolls, and an endless carrier or work support for supporting and guiding the work, comprising an endless chain and a plurality of straight edged blades mounted upon the links of said chain, substantially as described.

7. In a machine for beading shoe uppers, in combination, beading mechanism, a work support comprising an endless carrier and a plurality of blades mounted on said carrier, and a cement receptacle through which said blades are adapted to pass whereby said blades deliver cement to the inner opposing surfaces of the material supported thereby, substantially as described.

8. In a machine for beading shoe uppers,

the combination with the beading mechanism, of coöperating automatic means to apply cement to the work before it is beaded, substantially as described.

9. In a machine for beading shoe uppers, in combination, beading mechanism, a movable work support, and means for delivering to said work support an adhesive to be applied to the opposing surfaces of the material supported thereby, substantially as described.

10. In a machine for beading shoe uppers, in combination, beading and pressing rolls, means to rotate said rolls in opposite directions and means to impart to one of said rolls a relatively faster rotating speed, one of said rolls having provision to engage and feed the work and the other constructed to smooth or iron the same, substantially as described.

11. In a machine for beading shoe uppers, in combination, beading and pressing rolls, means to rotate said rolls in opposite directions, one of said rolls having a milled periphery and the other of said rolls having a smooth periphery with an annular groove therein, and means to impart to said latter roll a relatively slower speed of rotation than is imparted to the first mentioned roll, substantially as described.

12. In a machine for beading shoe uppers, in combination, beading and pressing rolls, means to rotate said rolls in opposite directions, means whereby one of said rolls may have a yielding movement toward and from the other of said rolls, and means for adjusting the normal position of said movable roll, substantially as described.

13. In a machine for beading shoe uppers, in combination, beading and pressing rolls, means to rotate said rolls in opposite directions, a movable bearing for one of said rolls, a spring acting upon said bearing, an adjustable limiting stop for the movable bearing to adjust the relative normal position of the peripheries of said rolls, and means to adjust the tension of the spring acting on the movable bearing, substantially as described.

14. In a machine for beading shoe uppers, in combination, beading and pressing rolls, a fixed bearing for one roll and a movable bearing for the other roll, a main shaft, worms mounted thereon engaging worm gears carried by the shafts of the rolls, the worm of the movable roll arranged to move along said shaft, and a locking coupling between the hubs of the movable worm and the fixed worm, substantially as described.

15. In a machine for beading shoe uppers, in combination, beading and pressing rolls, one of said rolls being connected directly to its shaft, a gear or pinion carried by the shaft of the other roll and engaging the internal gear carried by said roll, substantially as described.

16. In a machine for beading shoe uppers, in combination, beading and pressing rolls, shafts supporting and rotating said rolls, one of said rolls being loosely supported on its shaft, a geared connection between said loosely mounted roll and its shaft, a spring actuated brake engaging the periphery of the loosely mounted roll, and means to withdraw said brake, substantially as described.

17. In a machine for beading shoe uppers, in combination, beading and pressing rolls, a main shaft and gearing for operating said rolls, a brake arranged to act on one of said rolls, a clutch mechanism controlling the rotation of the main shaft, and connected mechanism under the control of the operator for actuating said clutch and withdrawing said brake, substantially as described.

18. In a machine for beading shoe uppers, in combination, beading mechanism, an endless movable work support for supporting and guiding the work to the beading mechanism, and a guard extending along the work support and parallel to the direction of movement, substantially as described.

19. In a machine for beading shoe uppers, in combination, beading mechanism, an endless blade-like movable work support, a guard extending parallel to said work support and closely adjacent thereto and having an upwardly extending projection at one end, substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

THOMAS QUINN.

Witnesses:
CLIFFORD A. COOK,
EFFIE A. NELSON.