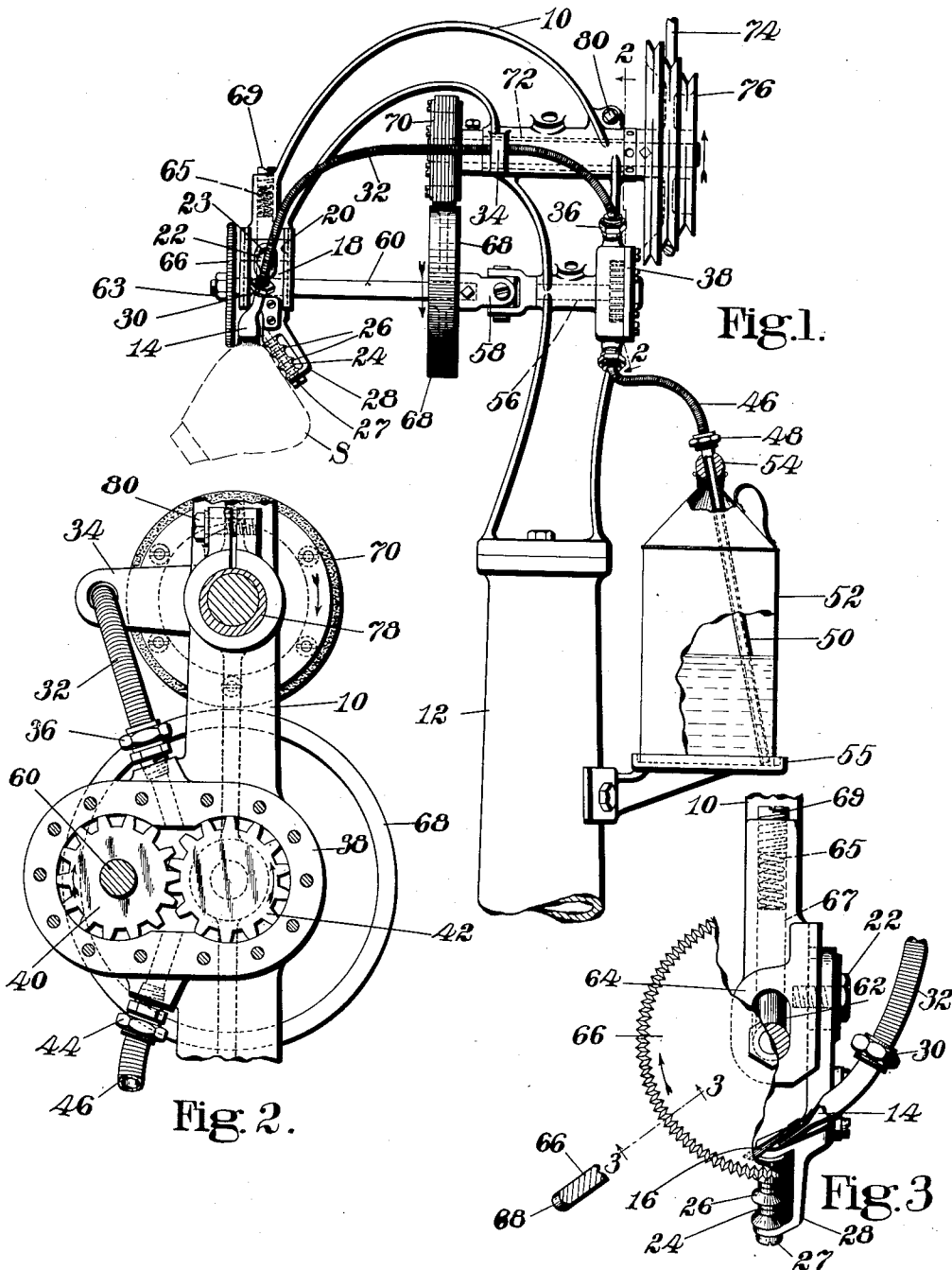


E. B. GRUSH.
CEMENTING MACHINE.
APPLICATION FILED MAY 16, 1918.

1,404,200.

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UNITED STATES PATENT OFFICE.

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CEMENTING MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ELMER B. GRUSH, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Cementing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

The present invention relates to cementing machines, it being especially applicable to apparatus of this character for applying a strip of cement about curved objects, as the lower edges of shoe uppers of the sneaker type, to which a foxing is to be applied.

It is difficult in such work to distribute the cement uniformly, this being particularly the case in rounding the more sharply curved portions, as the toes and heels of shoes, at which points, as the operator slows the relative movement of the work and applying member to better follow the curvature, there is a tendency for more cement to gather than at the straighter portions.

It is an object of my invention to provide a machine by which there may quickly and accurately be laid upon the work by an operator possessing average skill, a band of cement of substantially uniform thickness and width. In the accomplishment of this object, I utilize novel means for delivering cement to the work at a rate proportional to the relative movement of said work and the applying member. Preferably, this delivery is controlled by the position of the work, and I have here shown feeding means co-operating with the work and by the action thereof in turn governing the flow of cement.

Other objects and features will appear from the following description taken with the accompanying drawing, in which—

Fig. 1 is a partial side elevation of one embodiment of my invention with portions broken away;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1; and

Fig. 3 is a broken detail in end elevation of the cement-applying and feeding ele-

ments, the form of the edge of the feeding wheel being shown at the left of Fig. 3, this detail being taken on the line 3—3.

On an overhanging arm 10 from a frame standard 12 is mounted applying means in the form of a nozzle 14, at the lower extremity of which is an opening of such dimensions that for the normal travel of the work past it, it will lay thereon a strip of cement of the desired width and thickness. Secured to the upper face of the nozzle is a row of bristles or other distributing means 16, which serves to spread the cement upon the work and prevent its gathering together by its cohesive effect. The nozzle from its opening is inclined upwardly and rearwardly and is somewhat offset with respect to the main portion of the frame, it being attached to a carrier 18 which is vertically adjustable in ways 20 formed in the lower extremity of the arm 10. The carrier may be fixed in position by a screw 22 threaded into the frame arm and passing through a vertical slot 23 in the carrier. To aid in positioning the work with respect to the nozzle, there is mounted at the right, as viewed in Fig. 1 of the drawings, a rest designed to contact with the bottom of the shoe upper. This rest preferably consists of a roll 24, which may be in separate sections, each having a circumferentially reduced projection 26 so that it contacts with the work over a very limited area. This prevents disturbing the cement which has been applied to the surface with which the rest contacts. The roll or roll sections are shown as rotatable upon a spindle 27 fixed in an arm 28 secured at the lower extremity of the carrier 18. The angular position of the rest is such that during the greater part of the movement of a shoe upper beneath the nozzle, the co-operation of the rest with the bottom of the upper will maintain the correct relation of the work to the nozzle, so that the cement will be laid along the surface to which the foxing is to be applied. The upper end of the nozzle is joined by a union 30 to a flexible pipe or conduit 32, which, passing through a guide 34 upon the frame arm, is connected by a second union 36 to a nipple attached to a passage at the top of a casing 38 of a device for delivering

cement to the nozzle. In the present instance, this device is furnished by a pump having both a suction and forcing action. This is illustrated as of the double gear type, in which intermeshing toothed members 40 and 42 operate with the ends of the teeth in close proximity to the walls of partly cylindrical chambers in the casing, which chambers communicate to allow the co-operation of the members. A passage in the bottom of the casing is united by a nipple and union at 44 to another section of flexible pipe 46 joined by a union 48 to an intake section 50 of the conduit, this latter being preferably rigid. The length of the intake portion is such that it will extend nearly or quite to the bottom of the receptacle which constitutes the source of cement. I prefer that this receptacle shall consist of the original container in which the cement is purchased, and, to prevent the evaporation of the volatile solvent when the intake section is inserted in the receptacle, the latter has just below the union 48 an enlargement 54, which I have shown as spherical in shape and which is of such a diameter as to seat itself within and close the receptacle opening. The container may conveniently be mounted on a bracket 55 bolted to the standard 12 below the arm 10.

The member 40 of the pump is fixed upon a shaft 56 journaled in the vertical portion of the arm 10 and being connected by a universal joint 58 to a shaft section 60. This portion 60 of the shaft 56 is guided at its outer end for vertical movement in a slot 62 formed in a lug 64 projecting from the rear of the arm 10. It is normally held at the bottom of the slot by a spring 65 situated in a vertical bore near the end of the arm 10 and contacting with a plunger 67 extending into the slot 62 and resting against the shaft section 60. At its upper end the spring 65 abuts against a screw 69, closing this end of the bore, and by the rotation of which the tension of the spring may be adjusted. Upon the outer extremity of the shaft section 60 is a feeding member, preferably consisting of a wheel 66 separably secured by a nut 63. The periphery of this wheel is toothed, the projections having sharpened edges lying transversely of the wheel to furnish better feeding engagement with the work. These are also shown as rounded transversely so that the work may be more easily swung or tilted thereon to enable the operator to follow the correct line for the foxing. The inner side of the feed wheel is preferably in close proximity to the nozzle 14 and may serve as a gage to cut the upper edge of the strip of cement, giving a clean line at the juncture of the foxing and upper. The shaft sections 56 and 60, and therefore the pump and feed wheel, are driven together by gearing, preferably of

the friction type. Fixed upon the section 60 of the shaft at its inner end near the universal joint 58 is a wheel or disk 68, with the periphery of which contacts the edge of a disk 70 preferably made up of layers of material furnishing good frictional engagement, as leather or fiber. This disk 70 is fast upon the end of a horizontal shaft 72 mounted for rotation in the arm 10 above the shaft section 56 and driven by a belt 74 passing over a pulley 76. To allow the normal space between the edges of the disks 68 and 70 to be adjusted, the shaft 72 turns within a bore through an eccentric bushing 78, which is clamped in a divided portion of the frame and held in its adjusted position by a screw 80 passing through one of the frame divisions and being threaded into another.

Normally, the tension of the spring 65 holds the shaft section 60 at the bottom of the slot 62 and the edges of the disks 68 and 70 separated. The operator places a lasted shoe upper, as indicated in dotted lines at S in Fig. 1, with the bottom against the rest 24 and the upper line of the surface to which the foxing is to be applied at the inner edge of the wheel 66. When thus positioned, the opening of the nozzle 14 is just above the surface to be cemented, with the bristles 16 sweeping over it. At this time, due to the separation of the disks 68 and 70, both the pump and the feed wheel 66 are at rest, but as the operator presses the shoe up into position against the wheel, this compresses the spring 65 and the disks are brought into engagement, causing the upper, which is constantly driven, to rotate the lower frictionally, operating the pump and turning the feed wheel. The pump draws up the cement from the container through the conduit and forces it from the nozzle, and the feed wheel advances the work beneath the nozzle, the rate of this advance being so proportioned to the quantity of cement supplied by the pump that under these conditions the proper amount of cement is delivered through the nozzle. This application is naturally started along a straight side of the upper. When a more curved portion, as at the heel, is reached and the operator turns the work to follow this curvature, he naturally lessens the upward pressure. This causes the driven disk 68 to slip beneath the driving disk 70, so that the rate of advance of the work by the feed wheel and the quantity of cement supplied by the pump are both lessened, the correct ratio being approximately maintained. The curved portion having been rounded and the opposite straight side reached, the upward pressure becomes greater and the full rotative effect is imparted to the pump and feed wheel, again resulting in the full supply of cement for the maximum rate of advance. The toe por-

tion is similarly rounded at a lessened rate of feed and cement delivery, and, the entire strip being laid, the operator removes the work, whereupon the spring carries the disk
 5 68 entirely out of contact with the driving disk, and the flow of cement through the nozzle is checked by the consequent stopping of the pump. The relation between the advance of the work and the delivery of cement thereto may be varied by employing
 10 feed wheels of different diameters. When such a change is made, the position of the slide 18 is correspondingly altered to maintain the proper relation of the nozzle and
 15 roll to the periphery of the wheel.

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

1. In a cementing apparatus, a member
 20 for applying cement to the work, said work and applying member being relatively movable to distribute the cement over the work, movable means for delivering cement to the
 25 applying member, and means for moving the delivering means at a rate proportionate to the rate of relative movement of the work and applying member.

2. In a cementing apparatus, a member
 30 for applying cement to the work, said work and applying member being relatively movable to distribute the cement over the work, and means controlled by the position of the work for delivering cement to the applying
 35 member proportionately to the rate of relative movement of the work and applying member.

3. In a cementing machine, a source of cement, a cement-applying member, said applying member and work being relatively
 40 movable, a conduit connecting the source and applying member, and means for delivering cement from the source to the conduit proportionately to the rate of relative movement of the work and applying member.
 45 ber.

4. In a cementing machine, a cement-applying nozzle, means for feeding work in co-operation with the nozzle, and means for
 50 delivering cement to the nozzle in accordance with the rate of advance of the work.

5. In a cementing machine, a cement-applying member, means for feeding work in co-operation with the applying member, and means controlled by the position of the work
 55 for delivering cement to the applying member in accordance with the rate of advance of the work.

6. In a cementing machine, a source of cement, a cement-applying member, a movable member for feeding the work, means
 60 for delivering cement from the source to the applying member, and means controlled by the action of the work upon the feeding member for governing the cement-delivering
 65 ing means.

7. In a cementing machine, a source of cement, a cement-applying member, a movable member for feeding the work, means movable with the feeding member for delivering cement from the source to the applying member, and means controlled by the
 70 work for varying said movement.

8. In a cementing machine, a source of cement, a cement-applying member, a movable member for feeding the work, movable
 75 means for delivering cement from the source to the applying member, and means controlled by the work for varying the movement of the feeding member and cement-delivering means.
 80

9. In a cementing machine, a cement-applying member, a power-driven member for feeding the work in co-operation with the
 85 applying member, and means controlled by the work for governing the movement of the feeding member.

10. In a cementing machine, a cement-applying member, power mechanism, a member driven by the mechanism for feeding the work in co-operation with the applying
 90 member, and means controlled by the position of the work for governing the power mechanism.

11. In a cementing machine, a source of cement, a cement-applying member elevated
 95 above the source, means for raising the cement from the source and delivering it to the applying member, and means controlled by the work for governing the cement-delivering means.
 100

12. In a cementing machine, a source of cement, a cement-applying member elevated above the source, means for raising the cement from the source and delivering it to the applying member, means for feeding
 105 the work to the applying member, and means controlled by the action of the work upon the feeding means for governing the cement-delivering means.

13. In a cementing machine, a source of cement, a cement-applying member, means for delivering cement from the source to the
 110 applying member; a source of power, means for connecting the source of power and delivering means, and means co-operating with the work to control said connecting means.
 115

14. In a cementing machine, a source of cement, a cement-applying member, means for delivering cement from the source to the
 120 applying member, a source of power, means for connecting the source of power and delivering means, means co-operating with the work to control said connecting means, and means constructed and arranged to vary the
 125 normal relation of the connecting means.

15. In a cementing machine, a source of cement, a cement-applying member, rotatable means for delivering cement from the source to the applying member, a source of
 130

power, gearing for rotating the delivering means from the source of power, and means controlled by the work for governing the engagement of the gearing.

5 16. In a cementing machine, a source of cement, a cement-applying member, rotatable means for delivering cement from the source to the applying member, a source of power, gearing for rotating the delivering
10 means from the source of power, means controlled by the work for governing the engagement of the gearing, and means constructed and arranged to vary the normal separation of the gearing.

15 17. In a cementing machine, a source of cement, a cement-applying member, rotatable means for delivering cement from the source to the supplying member, a source of power, gearing for rotating the delivering
20 means from the source of power, means for holding the gearing normally out of engagement, and means controlled by the work for governing the engagement of the gearing.

25 18. In a cementing machine, a source of cement, a cement-applying member, a rotatable means for delivering cement from the source to the applying member, a source of power, frictional gearing for rotating the
30 delivering means from the source of power, and means constructed and arranged to vary the normal relation of the friction surfaces.

35 19. In a cementing machine, a source of cement, a cement-applying member, means for feeding the work in co-operation with the applying member, means for delivering
40 cement from the source to the applying member, a source of power, and means for connecting the source of power with the delivering means and feeding means, the contact of the work with the feeding means governing the connecting means.

45 20. In a cementing machine, the combination with a cement receptacle, of a nozzle, a pump for delivering cement from the receptacle to the nozzle, and means controlled
by the work for varying the rate of operation of the pump.

50 21. In a cementing machine, the combination with a cement receptacle, of a nozzle, a rotatable pump for delivering cement from the receptacle to the nozzle, and means controlled by the work for varying the rate of rotation of the pump.

55 22. In a cementing machine, the combination with a cement receptacle, of a nozzle, a rotatable pump for delivering cement from the receptacle to the nozzle, and a feed wheel rotatable with the pump, the character of the contact of the work with the feed wheel
30 varying the speed of rotation of the pump.

23. In a cementing machine, the combination with a cement receptacle, of a nozzle, a pump for delivering cement from the receptacle to the nozzle, gearing for rotating the

pump, and a feed wheel for the work rotatable with an element of the gearing.

24. In a cementing machine, the combination with a cement receptacle, of a nozzle, a pump for delivering cement from the receptacle to the nozzle, gearing for rotating the
70 pump, a feed wheel for the work rotatable with an element of the gearing, and a spring for maintaining the gearing normally out of engagement.

25. In a cementing machine, the combination with a cement receptacle of a nozzle, a pump for delivering cement from the receptacle to the nozzle, gearing for rotating the pump and having elements mounted for movement toward and from one another, and
80 a feed wheel for the work rotatable with an element of the gearing.

26. In a cementing machine, a frame arranged to support a receptacle near its lower portion, a nozzle mounted in the upper portion of the frame, a pump carried by the
85 frame, a conduit extending through the pump from the receptacle to the nozzle, a shaft for operating the pump movable in the frame, a feed wheel fixed to the shaft
90 adjacent to the nozzle, and gearing for the shaft.

27. In a cementing machine, a frame arranged to support a receptacle near its lower portion, a nozzle mounted in the upper portion of the frame, a pump carried by the
95 frame, a conduit extending through the pump from the receptacle to the nozzle, a shaft for operating the pump movable in the frame, a feed wheel fixed to the shaft
100 adjacent to the nozzle, a power-shaft, and co-operating friction disks upon the pump-shaft and power-shaft.

28. In a cementing machine, a frame arranged to support a receptacle near its lower portion, a nozzle mounted in the upper portion of the frame, a pump carried by the frame, a conduit extending through the pump from the receptacle to the nozzle, a shaft for operating the pump movable in
110 the frame, a feed wheel fixed to the shaft adjacent to the nozzle, a power-shaft, co-operating friction disks upon the pump-shaft and power-shaft, and means constructed and arranged to vary the normal
115 relation of the disks.

29. In a cementing machine, a frame arranged to support a receptacle near its lower portion, a nozzle mounted in the upper portion of the frame, a pump carried by
120 the frame, and a conduit extending through the pump from the receptacle to the nozzle and being arranged to enter the receptacle and carrying a closure for the mouth of said receptacle.

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

ELMER B. GRUSH.