No. 826,258. PATENTED JULY 17, 1906.

C. LAKIN.

MACHINE FOR VARNISHING RUBBER SHOES.

APPLICATION FILED MAR. 12, 1906.

3 SHEETS—SHEET 1.

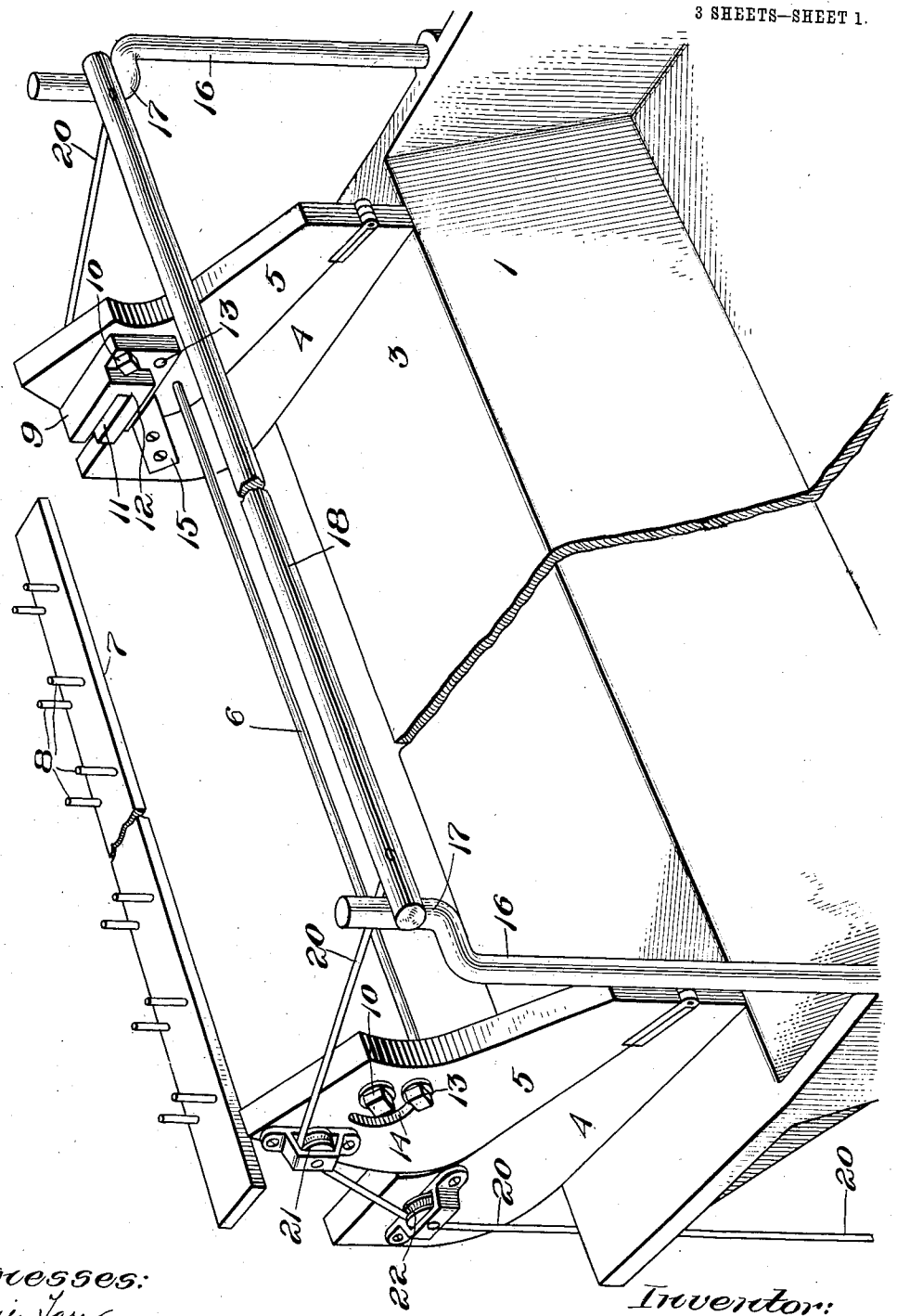


Fig. 1.

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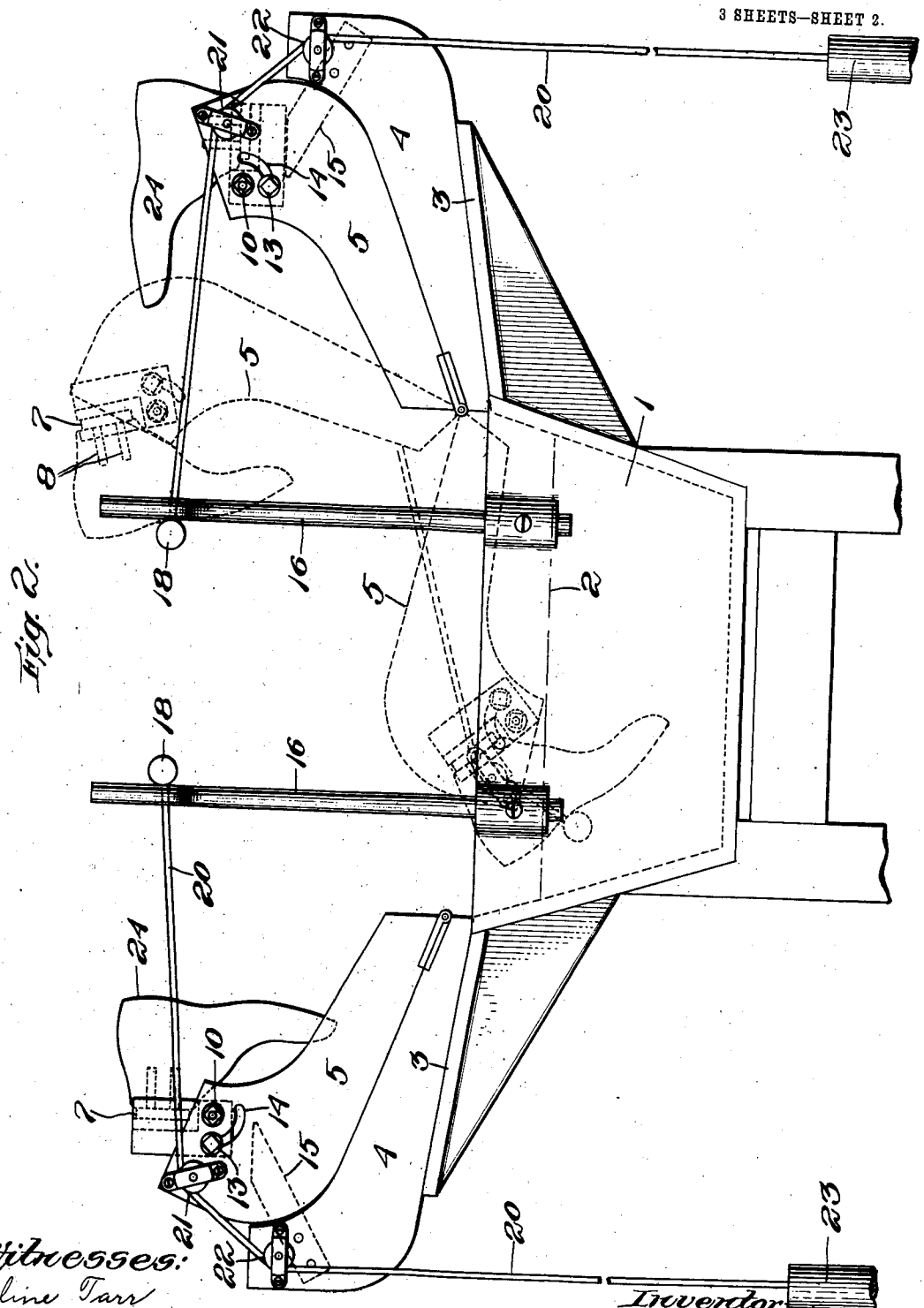


Fig. 2.

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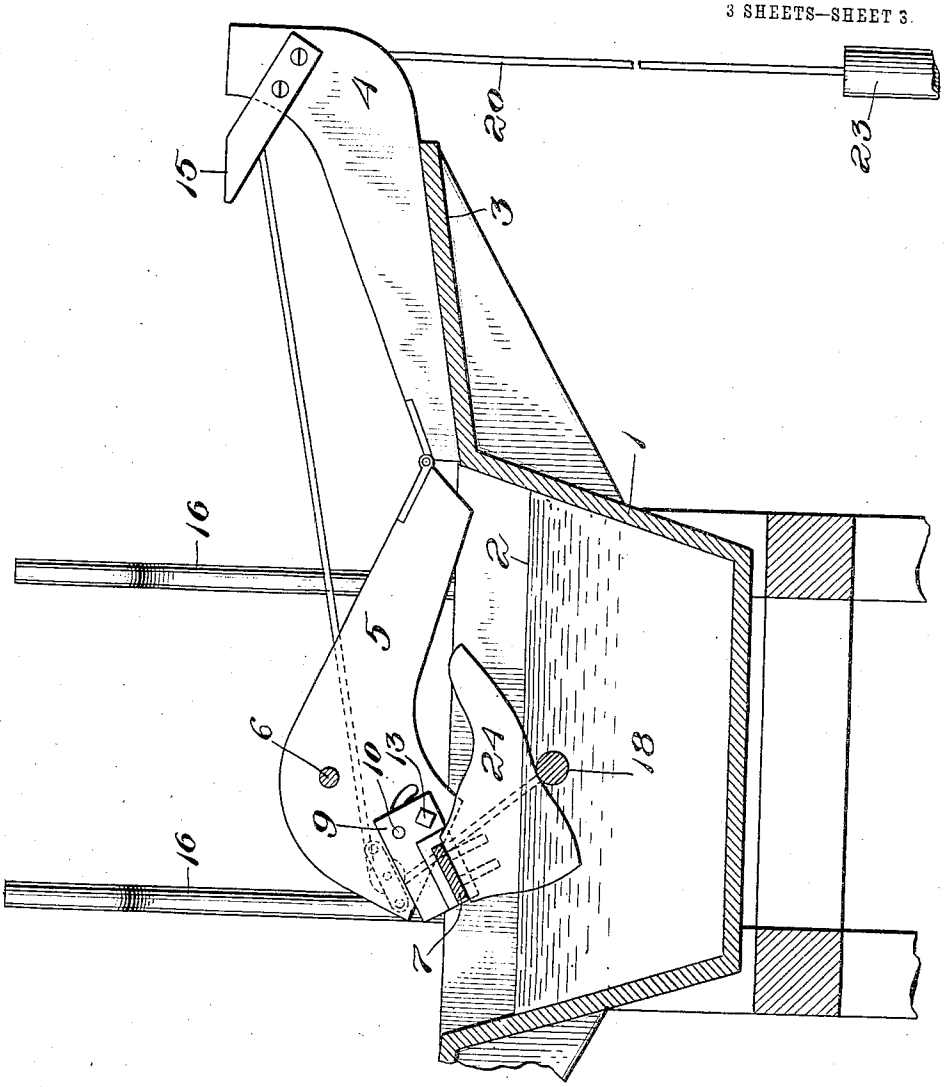


Fig. 3.

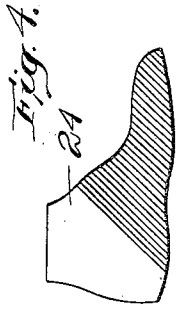


Fig. 4.

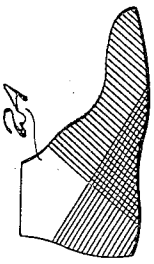


Fig. 5.

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# UNITED STATES PATENT OFFICE.

CHARLES LAKIN, OF MELROSE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO BOSTON RUBBER SHOE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## MACHINE FOR VARNISHING RUBBER SHOES.

No. 826,258. Specification of Letters Patent. Patented July 17, 1906.

Application filed March 12, 1906. Serial No. 305,532.

*To all whom it may concern:*

Be it known that I, CHARLES LAKIN, a citizen of the United States, residing at Melrose, county of Middlesex, Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Machines for Varnishing Rubber Shoes, of which the following is a specification, reference being had therein to the accompanying drawings.

In the process of manufacturing rubber shoes it is customary to varnish the shoes after they have been formed upon the last before being vulcanized. This is usually done by dipping. When the shoe is formed, the lining which closely fits the last comes up considerably higher on the last than is intended for the finished shoe, and the rubber coating also extends over more surface of the lining than is required for the finished shoe. The excess of material is to avoid the necessity of following the exact line of the finished shoe during the coating and varnishing, as thereby the work can be performed more quickly than if the exact line had to be followed. Subsequently the surplus material is trimmed off while the shoe is still on the last to give the exact contour to the top of the shoe, as desired. The varnishing or dipping is performed before the shoe is trimmed. This is usually done by hand by two dipping movements. The operator grasps between the thumb and fingers the upper portion of the last covered by the extension of the lining and dips the fore part into a tank or vat of the varnish, giving it a movement in a quick downward sweep so as to cover both the upper and the sole of the fore part, bringing it to a nearly horizontal position, taking care to dip it deep enough to cover fully as much as will be included in the finished shoe, then he lifts it out and dips the heel part. After both dipping operations the last with the shoe still on it is placed on a rack to drip before being placed in the vulcanizer. To avoid contact with the varnished portion of the shoe, a holder stick or bar is provided with upwardly-projecting pins which enter sockets in the top of the last, and a row of the shoes may thus be placed on one stick, which is set on a rack to allow the shoes to drip.

The object of the present invention is to provide a machine or an apparatus whereby a considerable number of shoes may be dipped at the same time by a single operator and without any hand contact with the shoe or last during the operation and to follow the principle of hand-dipping.

The invention will now be fully described, reference being had to the accompanying drawings, and the novel features will be particularly pointed out in the claims at the close of the specification.

In the drawings, Figure 1 is a perspective view of a machine embodying the invention, partly broken away and showing a portion only of the tank, the shoe-holder stick being shown detached. Fig. 2 is an end view showing the machine equipped with dipping apparatus on both sides of the tank, that on the right-hand side showing in full lines the rocking frame and shoe in position ready to be operated and showing in dotted lines the position when the rocking frame has been turned forward far enough for the shoes to engage the movable cross-bar which is connected with the weights and also showing in dotted lines the position when the fore part is being dipped, the apparatus on the left-hand side showing the position of the apparatus and shoe after the shoes on that side have been dipped and the rocking frame has been returned to position for the shoes to drip. Fig. 3 is a sectional view showing the position when the rear part is being dipped. Fig. 4 shows in shape the portion of the shoe which is covered by the first dipping. Fig. 5 shows the result after the rear portion has been dipped.

Referring now to the drawings, 1 is a box or tank containing the varnish 2. Extending from the upper edge of the side of the tank is a shelf or table 3, having the vertical side pieces or brackets 4, which support the hinged rocker-arms 5 when in their rearward position of rest. The two rocker-arms 5 are hinged to the upper edge of the front side of the tank 1 near opposite ends thereof, the upper edges of the side brackets 4 being preferably inclined so that the rocker-arms cannot swing down farther than is necessary for proper use of the apparatus. The two rocker-arms 5, preferably of iron, are connected by a rod 6 or other suitable connection so as to move together, and the two connected arms form a rack for the shoe-holder 7.

The shoe-holder 7 is a bar or stick pro-

vided with a double row of studs or pins 8 to engage sockets in the top of the lasts on which the shoes are formed and held, there being preferably two pins to engage each last, so that there shall be no swiveling movement of the last.

Pivoted to the inner face of each of the rocker-arms 5 of the rack is a grooved ear 9 to receive and hold the shoe-holder bar or stick 7. These ears are pivoted at one end on pivot-studs 10, so that the bar 7 can be given a rocking movement independently of the movement of the rocking arms 5. These ears 9 have a grooved way 11, open at one end and closed by a stop 12 at the other end, so that the flat holder-bar 7 can be inserted and withdrawn from one end of the holder-ears. Preferably the first stud 10 is near one corner of the ear at the end toward the tank, and a second stud 13 projects from the same end of the ear and passes through a curved guide-slot 14. The ends of the slot 14 form a stop to limit the independent movement of the ear 9 on its pivot 10. The stop-partition 12 at one end of the grooved way 11 in the holder-ear prevents the bar 7 from sliding out at that end.

Lugs 15 on the inner faces of the brackets 4 engage the ears 9 when the rocking arms 5 are in their position of rest to relieve the strain on the studs 13 and slots 14, and they are preferably so positioned that the open end of the grooved way 11 will not be lower than the closed end, so that the shoe-holder bar 7 will not slide out of itself.

Rising from the opposite ends of the tank 1 near the side are two standards or posts 16, each provided with an inwardly-offset portion or arm 17, which slightly overhangs the inside of the tank. A rod 18 extends across the tank of sufficient length to engage the inwardly-offset portions 17, the rod 18 being, however, short enough to go inside. The rod 18 bears against the uprights 16 on the opposite side from the rocker-arms 5 when the machine is at rest. Secured to the rod 18 near both ends are cords 20, which run over pulleys 21 on the outer faces of the rocker-arms 5 and then over pulleys 22 on the brackets 4 and have attached to their ends weights 23, which normally pull on the cords sufficiently to hold the rod 18 firmly against the posts 16 when in position of rest and to press against the bottoms of the shoes during the operation, so as to prevent the shoes from falling off from the holder and also to draw back the rod against the pressure of the shoe-holder and its load after the shoes have been dipped, as hereinbefore explained.

The operation of the apparatus is as follows: The shoe-holder while in the position of rest (shown on the right in Fig. 2) is loaded up with its full capacity of shoes 24. The holder may be made of any capacity desired, but for convenience in operation when operated by hand-power the preferred size is to have a capacity for six pairs of shoes for each holder. The operator standing in front of the machine grasps the shoe-holder bar 7 with his hands and the bar turns forward on the pivot far enough to bring the shoes about into a vertical position, toes down, and he pushes forward on the shoe-holder bar 7, thus turning the rocker-arms 5 forward on their pivots until the bottoms of the shoes strike the cross-rod 18, as shown in the upper dotted-line position in Fig. 2, and then continues the forward movement, the shoes pushing the rod 18 forward with them against the pull of the weights 23 and raising the weights 23, the pull-back tension of which serves to retain the rod in contact with the bottoms of the shoes, so that the shoes will be retained in position on the holder. The downward movement is continued until a little more than half of the shoe is dipped, then the operator turns the shoe-holder with his hand slightly to bring the toes up toward him and the heel part downward, as permitted by the curved slots 14, and again pushes on the shoe-holder to carry down the rocker-arms and shoe-holder and dip the heel end of the shoes, as shown in Fig. 3, to immerse the portion which was not dipped by the first dipping. Then he releases his pressure sufficiently to allow the weights to pull the rod 18 up against the uprights 16, and the rocking arms will by reason of the load turn still farther back into their original position, the weight of the fore part of the shoes causing the holder-bar to stand in the position shown on the left in Fig. 2, with the toes down, so that the shoes may drip. The curved slot 14 allows the turning of the holder-bar to bring the shoes into this position. He leaves them thus long enough for the superfluous varnish to drip off. The shoe-holder is then withdrawn from the machine, with the shoes still carried by it, and is placed on a rack or conveyer to be transferred to the vulcanizer. There is sufficient clearance-space between the cross-bar 18 and the shoe-holder bar 7 when both are in their positions of rest to adapt the apparatus to any size shoe desired.

The preferred form of construction is to have two sets of dipping mechanism connected with each tank, as shown in Fig. 2, one on each side, and have one operator attend to both sets, so that while one set of shoes is allowed to drip after being immersed he may dip another set on the other side, and thus economize his time. The length of time required to set up and dip the second set is just about enough for the first set to drip.

While I have shown and described the apparatus as operated by hand, mechanism can be devised to actuate the shoe-holder auto-

matically, giving it the proper forward and back and turning movement, and I should consider a machine which embodied the principle of construction and operation hereinbefore described, but operated automatically, as coming within the scope of my invention. It is also obvious that there are well-known equivalents for the weights 23 to give tension to the cross-bar 18. It is also obvious that instead of the cross-bar 18 clamps or other fastening devices might be employed to prevent the lasts from being displaced from the holder during the movement of the rocker-arms, and the return movement could be given either by the strength of pull of the operator by hand or by other means, and thus dispense with the cross-rod and weights.

What I claim is—

1. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame which rises above the tank, and a shoe-holder carried by said rocker-frame, the rocker-frame being movable on its pivot to raise and lower the shoe-holder, said holder having a pivotal connection with said rocker-frame whereby said holder may be turned independently of the rocker-frame to bring alternately the heel portion and the fore part of the shoe downward whereby the fore part and the heel part of the shoe may be successively dipped.

2. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame which rises above the tank and is adapted to rock in a vertical plane over the varnish in the tank and a shoe-holder pivotally connected with the rocker-frame whereby the shoe-holder has a movement in a vertical plane together with the rocker-frame and may have a secondary rocking movement in the same vertical plane independent of the movement of the rocker-frame.

3. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one side to the upper portion of the varnish-tank and adapted to rock forward so as to extend over the tank, a support for the rocker-frame when in its backward position, a shoe-holder adapted to carry the shoes and having a pivotal connection with said rocker-frame whereby said shoe-holder may have a secondary rocking movement independent of the movement which it has in connection with the rocker-frame.

4. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one side to the upper portion of the varnish-tank and adapted to rock forward so as to extend over the tank, a support for the rocker-frame when in its backward position, a shoe-holder bar adapted to hold and carry the shoes, ears pivoted to the rocker-frame and having grooved ways to receive the shoe-holder bar whereby the shoe-holder may be secured therein and detached therefrom.

5. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one side to the upper portion of the varnish-tank and adapted to rock forward so as to extend over the tank, a support for the rocker-frame when in its backward position, a shoe-holder bar adapted to hold and carry the shoes, ears pivoted to the rocker-frame and having grooved ways to receive the shoe-holder bar whereby the shoe-holder may be secured therein and detached therefrom, and stops which limit the independent rocking movement of said ears and shoe-holder with relation to the rocker-frame.

6. A rubber-shoe-varnishing machine having a varnish-tank, a plurality of rocker-arms hinged at one end and adapted to rock forward so that the free end of the rocker-arms will project over the interior of the tank, rearward supports for the rocker-arms when they are swung backward, ears pivotally connected with the inner faces of the rocker-arms, whereby said ears may be rocked on their pivots independent of the movement of the rocker-arms, stops which limit the arc of movement of said ears, a bar adapted to receive lasts containing the shoes, grooved ways in said ears to receive said shoe-holder bar in such manner that the holder-bar may be carried by the rocker-frame and may be detached therefrom.

7. A rubber-shoe-varnishing machine having a varnish-tank a plurality of rocker-arms hinged at one end and adapted to rock forward so that the free end of the rocker-arms will project over the interior of the tank, rearward supports for the rocker-arms when they are swung backward, ears pivotally connected with the inner faces of the rocker-arms, whereby said ears may be rocked on their pivots independent of the movement of the rocker-arms, stops which limit the arc of movement of said ears, a bar adapted to receive lasts containing the shoes, grooved ways in said ears to receive said shoe-holder bar in such manner that the holder-bar may be carried by the rocker-frame and may be detached therefrom, the shoe-holder bar being provided with a plurality of pins adapted for connection with the lasts on which the shoes are held.

8. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one side and adapted to rock forward so that its free end will extend over the interior of the tank and rock backward, a support for the rocker-frame when in its backward position; a shoe-holder bar adapted to carry the shoes and means for retaining the shoes on the holder during the rocking movement.

9. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at

one side and adapted to rock forward so that its free end will extend over the interior of the tank and rock backward, a support for the rocker-frame when in its backward position, a shoe-holder bar adapted to carry the shoes, and movable tension-controlled means for retaining the shoes on the holder during the rocking movement.

10. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one side and adapted to rock forward so that its free end will extend over the interior of the tank and rock backward, a support for the rocker-frame when in its backward position, a shoe-holder bar adapted to carry the shoes and having a pivotal connection with the said rocker-frame, whereby said shoe-holder may have a secondary rocking movement independent of the movement which it has in connection with the rocker-frame, standards rising from the ends of the varnish-tank to some distance above the tank and having projections which extend inwardly above the inner edge of the tank, a rod which extends transversely above the tank and engages said inward projections on the standards on the opposite side from the rocker-frame, cords connected with said rod near opposite ends thereof and extending over pulleys on the sides of said rocker-frame and said supports for the rocker-frame, means for giving tension to said cords whereby the said rod is held normally in contact with the projections on said standards, and is held in engagement with the bottoms of the shoes to retain the shoes on the holder when the rocker-frame is turned forward over the tank.

11. A rubber-shoe-varnishing machine having a varnish-tank, two rocker-arms each hinged at one end near opposite ends of the tank, said rocker-arms being adapted to swing forward over the interior of the tank, a connection between said rocker-arms which causes them to move as one frame, ears pivoted to the inner faces of said rocker-arms, a curved guide-slot in the side of each rocker-arm on an arc whose center is the axis of the pivot-pin, a stud projecting from the ear and engaging with said guide-slot whereby the turning movement of the ear on its pivot is limited, and a shoe-holder bar adapted to be held by engagement with said ears.

12. A rubber-shoe-varnishing machine having a varnish-tank, two rocker-arms each hinged at one end near opposite ends of the tank, said rocker-arms being adapted to swing forward over the interior of the tank, a connection between said rocker-arms which causes them to move as one frame, ears pivoted to the inner faces of said rocker-arms, a curved guide-slot in the side of each rocker-arm on an arc whose center is the axis of the pivot-pin, a stud projecting from the ear and engaging with said guide-slot whereby the turning movement of the ear on its pivot is limited, grooved ways on the inner faces of the ears, a shoe-holder bar adapted to be inserted in the said grooved ways in the ears and thereby carried by the rocker-arms, said pivotal connection of the ears with the rocker-arms enabling the shoe-holder to be turned in relation to the rocker-arms independently of the movement of the rocker-arms.

13. A rubber-shoe-varnishing machine having a varnish-tank, two rocker-arms hinged each at one end to the upper portion of one side of the tank near opposite ends of the tank, said rocker-arms being adapted to swing forward over the interior of the tank, supports for the rocker-arms in their rearward position which prevent the rocker-arms from turning backward below a fixed point, ears pivoted to the inner faces of said rocker-arms, a curved guide-slot in the side of each rocker-arm on an arc whose center is the axis of the pivot-pin, a stud projecting from the ear and engaging with said guide-slot whereby the turning movement of the ear on its pivot is limited, grooved ways on the inner faces of the ears, a shoe-holder bar adapted to be inserted in the said grooved ways in the ears and thereby carried by the rocker-arms, said pivotal connection of the ears with the rocker-arms enabling the shoe-holder to be turned in relation to the rocker-arm independently of the movement of the rocker-arms and stops which engage the ears on the rocker-arms when in their rearward position to limit the backward turning of the ears.

14. A rubber-shoe-varnishing machine having a varnish-tank, a rocker-frame hinged at one end and adapted to swing forward over the interior of the tank, a support for the rocker-frame in its rearward position which prevents the rocker-frame from turning backward below a fixed point, side arms on said rocker-frame, ears pivoted to the inner faces of said rocker-arms, a curved guide-slot in the side of each rocker-arm on an arc whose center is the axis of the pivot-pin, a stud projecting from the ear and engaging with said guide-slot whereby the turning movement of the ear on its pivot is limited, grooved ways on the inner faces of the ears, a shoe-holder bar adapted to be inserted in the said grooved ways in the ears and thereby carried by the rocker-arms, said pivotal connection of the ears with the rocker-arms enabling the shoe-holder to be turned in relation to the rocker-arm independently of the movement of the rocker-arms, standards rising above the ends of the tank and having projections which extend inwardly toward each other above the interior of the tank, a loose rod which extends crosswise above the tank and engages said inward projections on the standards on the opposite side from the

rocker-frame, cords extending from said loose rod rearward over pulleys in the sides of the rocker-arms and supporting-frame for the rocker-arms and weights attached to the rear ends of said cords whereby the said loose rod is normally held against the projections on said standards, said rod engaging said standards at such an elevation that when the rocking frame is turned forward the bottoms of the shoes carried by said shoe-holder will engage said loose rod and carry it forward in a continued movement of the rocker-frame, said shoe-holder bar being adapted to be turned on its pivot when the rocker-frame is swung forward over the surface of the varnish in the tank, whereby the shoes may be turned to immerse alternately the fore part and the rear part of the shoes in the varnish, the pressure of the loose rod on the bottoms of the shoes retaining the shoes in the holder.

15. A rubber-shoe-varnishing machine having a varnish-tank, a shoe-holder bar adapted to receive and hold a last on which the shoe is held and a movable support for the shoe-holder bar having a compound movement whereby the shoe while on the holder may be lowered into the tank and the holder turned to dip alternately the heel and fore-part portions of the shoe, one portion being out of the liquid while another is being dipped.

16. A rubber-shoe-varnishing machine having a varnish-tank, a shoe-holder bar adapted to receive and hold a plurality of lasts on which the rubber shoes are held and a movable support for the shoe-holder bar having a compound movement whereby the shoes while on the holder may be lowered into the tank to dip one portion of each shoe and then the shoe-holder may be turned to bring another portion of each shoe into the liquid contained in the tank and then withdrawn, the shoe-holder being removably connected with said movable support.

17. A rubber-shoe-varnishing machine having a varnish-tank, a movable frame, a shoe-holder pivoted to said movable frame, said frame being movable to bring the shoe-holder into and out of proximity to the liquid in the tank, the shoe-holder having a swinging movement in a vertical plane independently of the movement of the frame whereby the frame may be moved to dip one end of the shoe and then the holder may be turned to dip the other end of the shoe.

18. A rubber-shoe-varnishing machine having a varnish-tank, a frame pivoted at one end and having its other end free to turn down toward the liquid in the tank, a shoe-holder pivoted to said frame and having a swinging movement in a vertical plane independent of the movement of the frame whereby said frame may be turned and the shoe held to dip the heel portion of the shoe while the fore part is turned up, and then the holder may be turned to bring the fore part downward to dip the fore part while the heel part is turned up.

19. A rubber-shoe-varnishing machine having a varnish-tank, a frame hinged so that its free end will swing down toward the liquid in the tank, a shoe-holder pivotally connected with the swinging end of the frame and carried thereby and having a swinging movement in the frame independently of its movement with the frame, the shoe-holder being adapted for manual operation to move the frame while the shoe-holder is held in fixed relation to the frame to dip one end of the shoe, and the holder may then be turned to dip the other end of the shoe while the first dipped end is out of the liquid.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES LAKIN.

Witnesses:
WILLIAM A. COPELAND,
ALNIE TARR.