June 13, 1933. W. ORNSTEEN 1,913,610

WORK HOLDING APPARATUS

Filed Feb. 10, 1931 2 Sheets-Sheet 1

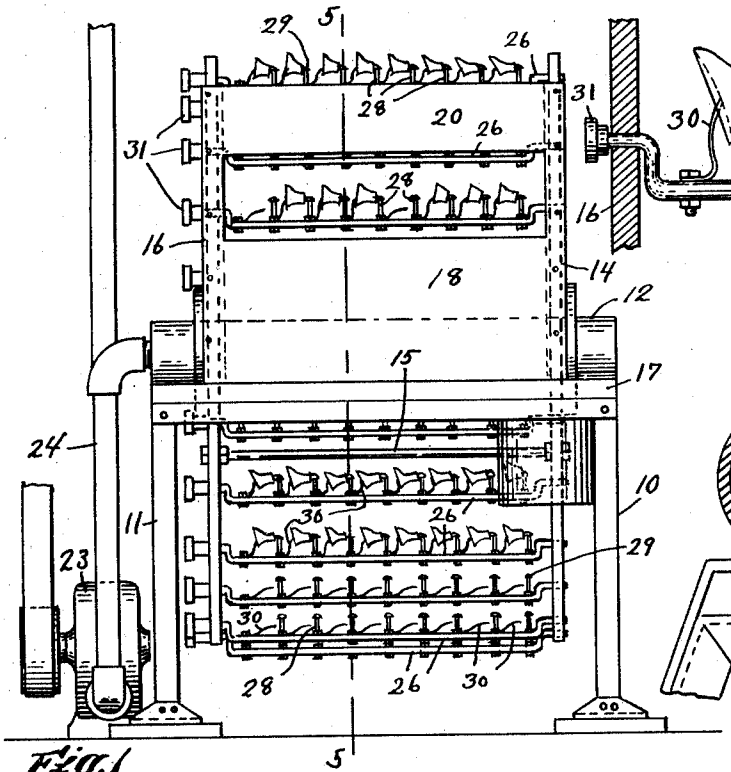


Fig. 1.

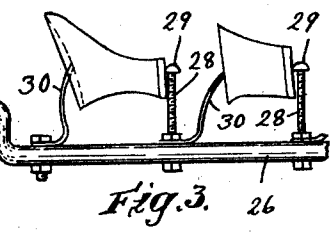


Fig. 3.

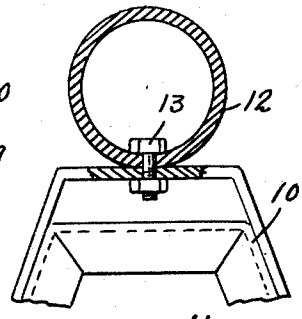


Fig. 4.

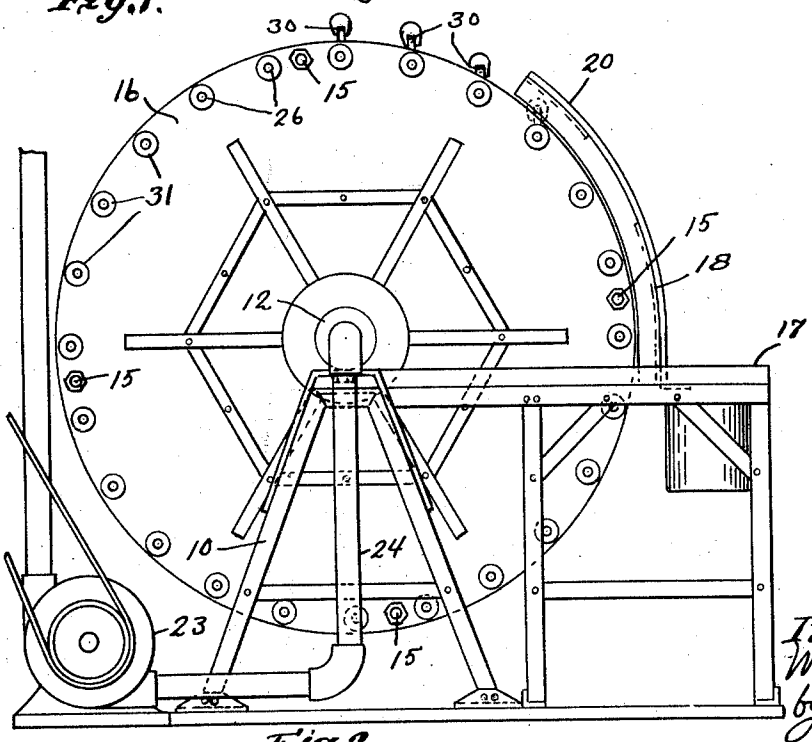


Fig. 2.

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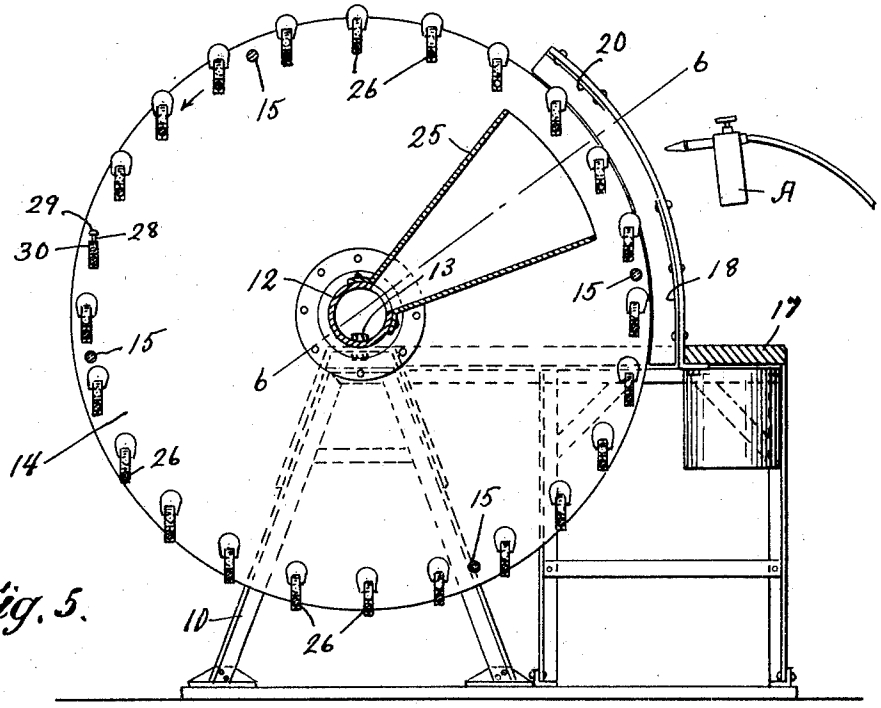


Fig. 5.

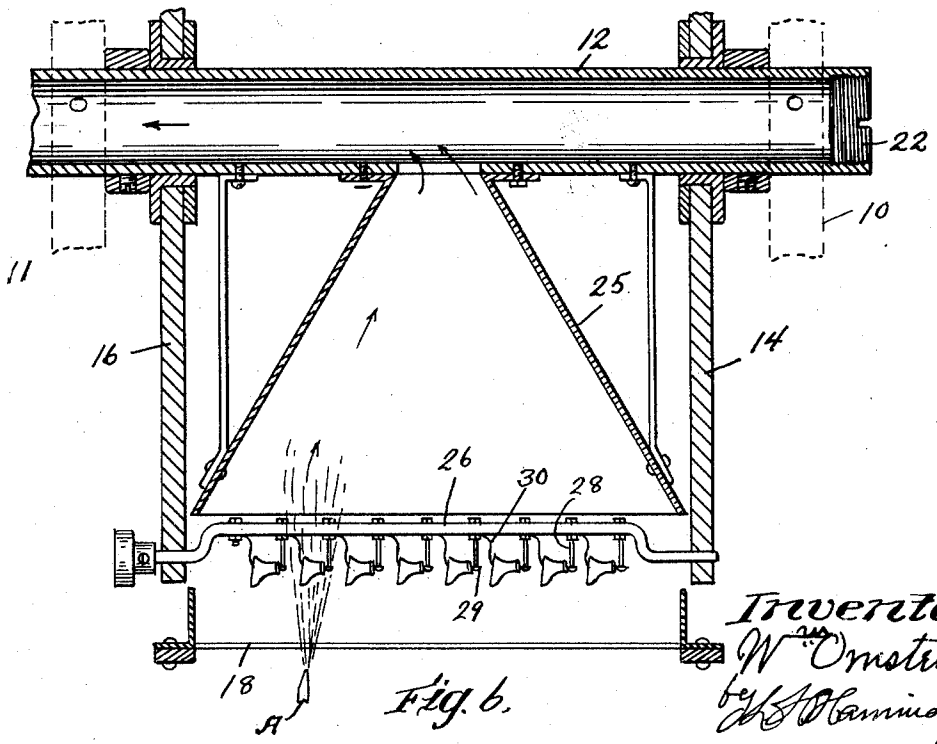


Fig. 6.

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UNITED STATES PATENT OFFICE

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WORK HOLDING APPARATUS

Application filed February 10, 1931. Serial No. 514,777.

This invention relates to devices for holding small articles while they are being coated by spraying or atomizing a lacquer thereon, and more particularly to a device for this purpose which is especially adapted for use in finishing the sides of heels for shoes, usually wood heels which either have been previously covered with a thin sheet of celluloid, or heels to which the lacquer is applied directly.

In performing the operation of spraying or atomizing lacquer on heels, it is necessary to apply the coating uniformly to the sides, back, and sometimes the breast surfaces, and permit the lacquer to harden before they are handled, and to provide effective means for removing the fumes, which are necessarily discharged into the air, from the room in which the operation is performed.

The objects of my invention are to provide a holding device for small articles like heels, which will enable the spraying operation to be rapidly and uniformly performed on all portions of the surfaces which must be coated, which will enable the lacquer to harden for a suitable length of time on one lot of heels without delaying the operation on others, but which will enable an assistant to the operator to remove the coated heels and place others in position for coating as rapidly as the operation can be performed, which will enable all fumes discharged into the air, while the operation is being performed, to be thoroughly exhausted from the room in which the work is being performed, and which will provide means for effectively holding heels which vary widely in height in a manner in which will enable the operation to be effectively performed.

I accomplish these objects by means of the construction hereinafter described and illustrated in the accompanying drawings, in which:

Fig. 1 is a front elevation of an apparatus embodying a preferred form of my invention.

Fig. 2 is a side elevation thereof.

Fig. 3 is a detail view of a portion of a heel holder which is preferably employed.

Fig. 4 is a detail view of a connection between the end brackets and main supporting shaft which is employed.

Fig. 5 is a sectional view at line 5—5 of Fig. 1 and

Fig. 6 is a sectional view at line 6—6 of Fig. 5.

As shown in the drawings the apparatus comprises a pair of upright frames 10 and 11 on the top of which a horizontally arranged hollow-shaft, or pipe 12 is secured by bolts 13, as shown in Fig. 4, so that said frames are rigidly connected and said shaft is held in fixed relation. A pair of flat sheet metal disks 14, 16 are rotatably mounted on the shaft 12 in proximity to the frames 10, 11, respectively, said disk being connected by cross rods 15, so that they are held in fixed relation and will rotate as a single structure on the shaft 12.

The frames 10, 11 are extended forwardly to provide a support for a table 17, and for two sheet metal shields 18 and 20, the shield 18 being arranged to extend upward from the table in front of, and close to the peripheral edges of the disks 14, 16 and entirely across the space therebetween, and the shield 20 being similarly arranged and supported above the shield 18, so as to provide a narrow opening between the adjacent edges and the space between the disks.

As shown in Figs. 1, 2 and 6, one end of the shaft 12 is closed by a cap 22, and the opposite end is connected to an exhaust fan 23 by a pipe 24. The shaft 12 has a funnel shaped conductor 25 mounted on the middle portion thereof, said conduction being extended towards the opening between the shields 18, 20, and terminating at a suitable distance from the inner sides thereof. The open end of said conductor corresponds in shape to said opening and has its top and bottom sides, and its ends extending convergently from the opening between the shields to the shaft 12, to the interior of which it is in open communication, as shown in Figs. 5 and 6.

As above stated, the apparatus hereinbefore described is primarily designed for use in spraying heels, and to this end I provide each disk 14, 16, with a series of apertures which are circularly arranged therein in close

proximity to the peripheral edges thereof and are regularly spaced apart, and arranged so that each aperture in one disk is in alignment with a corresponding aperture in the other disk. I also provide a series of rods 26, each of which is rotatably mounted at its ends in the corresponding apertures of each disk. Each rod 26 is provided with two right angular bends adjacent its ends, so that its middle portion is offset by crank arms to one side of the axis about which the rod rotates, and said middle portion is provided with a series of heel holders, or clamps, each of which consists of a rigid post 28, having an enlarged head 29 on its end provided with a sharp edge, and a flat spring, or resilient arm 30. Said posts 28 are each rigidly mounted on the rod thereof and extend perpendicularly thereto towards the axis of the rod and each spring 30 is secured on the rod at a suitable distance from its corresponding post and normally extends obliquely from the rod towards the end of the post.

Each post and spring constitute the members of a clamp, and, in placing a heel in position therein, the top lift, or tread end, preferably, of the heel is engaged with the edge of the head 29 of the post and the spring 30 is pulled away from the post until its end portion can be engaged with the base of the heel, as shown in Fig. 3. As the spring of each clamp is made of highly resilient steel, so that its free end may be moved thru a considerable distance, heels of a wide range of heights may be held sufficiently securely for the purpose in each clamp and may be quickly placed therein and removed therefrom. A knob 31 is mounted on one end of each rod, so that the rod may be rotated easily. As the portion of the rod on which the heel clamps are mounted is off-set from the axis of the rod, when a heel is in position in a clamp, the middle line of its breast surface will be held close to, or nearly coincident with the axial line of the rod, as shown in Fig. 3, so that, when the rod is rotated, the heels thereon will be rotated about an axis which approximates to the longitudinal axis of the curved sides and back of the heel.

The opening between the adjacent edges of the shields 18, 20 corresponds in width to the distance between adjacent rods 26, so that when any one of the rods is held midway of the opening the heels on the rods next adjacent thereto will be held in the rear of the shields above and below it respectively. The distance between the inlet end of the conductor 25 and the shields 18, 20 is sufficient to permit the rods 26 with the heels thereon to pass therebetween, as shown in Figs. 5 and 6.

The manner of using the hereinbefore described apparatus is as follows: The operator stands in front of the table 17 and is provided with a common form of lacquer atomizer, as A, which is supplied with air under pressure.

An assistant also stands at the rear side of the machine and places a heel to be coated in each clamp of each holder rod 26, so that when the operator moves the rod supporting disks rotatably, each rod may be brought successively into position for spraying opposite the opening between the shields. The operator then sprays each heel on a rod which he has thus brought into position, turning the rod as he sprays each heel so that he can apply a uniform coating of lacquer over the entire side and back surfaces of the heel, and on the breast surfaces if desired. When the lot of heels on one rod has thus been coated, the supporting disks will be rotated sufficiently to bring the next holder rod into position opposite the opening between the shields, so that the above described operation may be repeated. By the time the heels which have thus been coated will have reached the back side of the holder, the lacquer with which they have been sprayed will have hardened, so that the coated heels may be removed and others placed in position by the assistant, thereby enabling the operation to be carried on continuously.

The particular construction of the heel holding means is particularly advantageous in this connection as, by holding the heel in such a manner that it may be moved rotatably about an axis which is closely adjacent the longitudinal center line of its breast surface, the work of the operator is made less difficult as the curved surface of the heel, which is to be sprayed will be moved, approximately, about the center line of its curvature. The heels will also be held at a sufficient distance from the rod on which they are mounted to enable the breast surfaces of the heels to be sprayed without difficulty. As shown in Figs. 5 and 6, the inlet opening to the air exhausting conductor 25 extends for nearly the entire width of the space between the rod supporting disks, and is of a width slightly greater than the width of the opening between the shield sections 18, 20, so that the spray from the atomizer which is directed against the surfaces of the heels through this opening will be directed towards, or into the inlet opening to the air exhausting means. Consequently practically all of the lacquer spray which does not lodge on the heels, or other parts will be directed into, or drawn into the air conductor and thus carried from the room in which the apparatus is located by the exhaust fan.

The shields prevent the spray from the atomizer from striking the heels in adjacent heel holders above and below the particular holder which is being operated on, and materially assist in causing the spray which does not lodge on the heels to be drawn into the funnel shaped conductor 25, as air cur-

rents to supply the exhaust fan will not only be drawn in thru the opening between the shields, but will also be drawn from the space between the disks and the shields. The escape of fumes from the lacquer into the room in which the operation is performed is thus effectively prevented.

The entire operation of coating heels, or other small articles, by spraying, may thus be rapidly and effectively performed.

I claim:

1. An apparatus for the purpose described comprising a tubular shaft, a pair of supports mounted for rotation on said shaft and connected together in fixed, spaced relation, a series of work holders extending between said supports and mounted therein in circular relation to the axis of said supports, whereby they may be carried in a circular path by said supports, an air conductor connected to the interior of said shaft and having an inlet mouth disposed within and in proximity to said path, and means for exhausting the air from said shaft while the holders are successively held in front of the mouth of said conductor.

2. An apparatus for the purpose described comprising a tubular shaft, a pair of circular supports mounted for rotation thereon and connected in fixed relation at a suitable distance from each other, a series of work holders disposed between and rotatably mounted at their ends in said supports, adjacent the peripheral edges thereof, a tubular conductor connected at one end to the interior of said shaft and opening at its opposite end adjacent and within the path in which said holders move when said supports are rotated, to permit the holders to be held successively in front of the opening to said conductor and means for exhausting the air from said shaft.

3. An apparatus for the purpose described comprising a hollow shaft, a pair of substantially imperforate circular, disk-like supports mounted for rotation on said shaft and connected in fixed relation, a series of work holding rods mounted at their ends in said supports adjacent the peripheral edges thereof, in position to be carried in an approximately cylindrical path, when said supports are rotated, an air conductor mounted on and interiorily connected to said shaft between said supports and having an inlet opening within and adjacent said path in front of which each of said rods may be successively held and means for exhausting the air from said shaft.

4. An apparatus for spray-coating articles comprising a pair of supports mounted for rotation about a common axis, spaced apart and connected in fixed relation, a series of article holding rods rotatably mounted at their ends in said supports and disposed in circular relation to said axis, means on each of said rods for holding a plurality of articles in a row extending longitudinally thereof, whereby the articles on each rod may be successively carried into a position to be sprayed and moved rotatably while in said position, and an air exhausting conduit mounted within the path of movement of said rods as they are carried by said support and having an inlet mouth the sides of which terminate in proximity to the inner periphery of said path and in front of which the articles on each rod are held while in said position.

5. An apparatus for spray-coating articles, comprising a rotatably mounted support, a series of elongated article holders mounted on said support in spaced relation about its axis and in position to be carried in a cylindrical path, thereby, when it is rotated, a shield mounted exteriorly of, and in proximity to said path and having an opening corresponding to the dimensions of the holders, opposite which the articles on each holder may be successively held while being sprayed, and an air-exhausting conduit disposed within said path and having an inlet mouth disposed in register with the opening in said shield, and in proximity to the inner periphery of said path, whereby surplus spraying material discharged through said opening will pass into said conduit.

6. In an apparatus for spray coating articles, a support, a fixed conduit on which said support is rotatably mounted, a series of suitably spaced article holders mounted on said support in position to be carried thereby in a circular path to bring said holders successively into a position to be sprayed, said conduit being extended radially of said path into proximity with the inner periphery thereof and having an inlet mouth at its outer end in front of which each holder is held in when in position to be sprayed, and means for exhausting air from said conduit.

7. An apparatus for spray coating articles comprising a circular support mounted for rotation about a horizontal axis, a series of elongated article holders mounted in spaced relation on said support for rotation about longitudinal axes equidistant from and parallel to the axis of said support, whereby said holders may be carried in a circular path and may be successively moved into a position to be sprayed and independently rotated while in said position, and an air exhausting conduit mounted within said path and having a fixed inlet mouth opening in proximity to said path in position to permit each holder to be held in front thereof when in position for spraying.

8. An apparatus for spray coating small articles comprising a circular support mounted for rotation about a horizontal axis, a series of elongated article holders each having means for holding a plurality of articles thereon in longitudinally spaced relation and mounted in spaced relation on said support

for rotation about longitudinal axes equidistant from and parallel to the axis of said support, whereby said holders may be moved in a circular path and may be successively moved into a position for spraying the articles thereon and independently rotated while in said position, and an air-exhausting conduit mounted within said path and having a fixed inlet mouth extending for approximately the length of the holders and opening in proximity to said path, to permit each holder to be held in front thereof when in position for spraying.

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

WILLIAM ORNSTEEN.