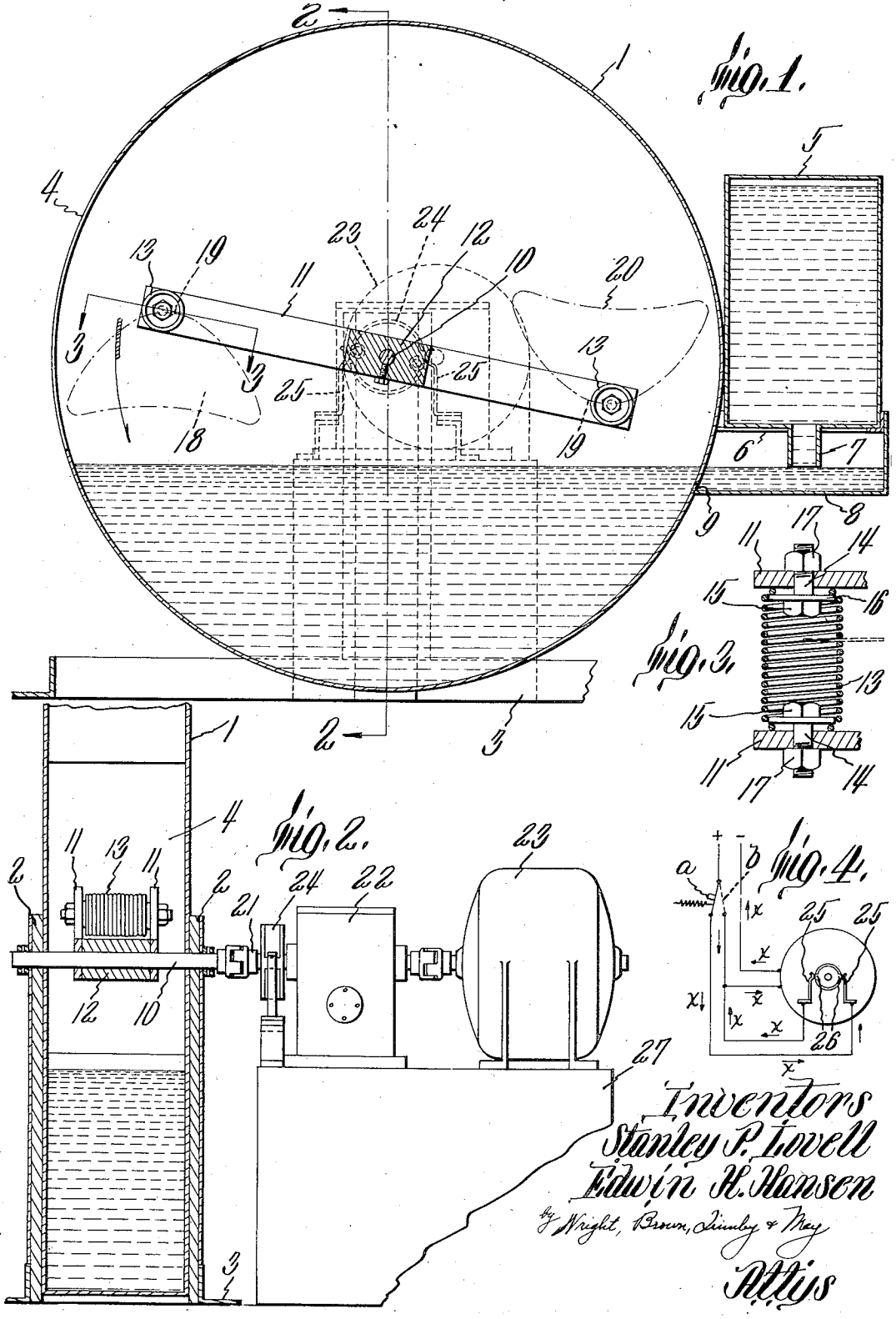
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APPARATUS FOR TREATING SHOE STIFFENER BLANKS AND THE LIKE

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APPARATUS FOR TREATING SHOE STIFFENER BLANKS AND THE LIKE

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This invention relates to apparatus for treating shoe stiffener blanks or the like. It is especially applicable to box toe blanks of the class capable of being rendered limp and mouldable by a liquid for assembly with shoe uppers. The treatment or conditioning of such blanks is sometimes performed at the shoe factory prior to their assembly with the shoe uppers and the performance of the pulling-over and lasting operations, which conform the blanks to the shape of the last. The apparatus of the present invention meets such latter need and can be applied, for instance, in connection with so-called celluloid box toe blanks, i. e., those blanks wherein celluloid serves as the stiffening agent for a fabric or other suitable fibrous foundation. Blanks stiffened with celluloid or other cellulose derivative are now well known articles of manufacture supplied to the shoe trade. When properly prepared, they can be rendered limp quickly, as by immersion in a volatile solvent or gelatinizing medium for the celluloid or other cellulose derivative serving as the stiffening agent. The limp blank, after assembly with the shoe upper and moulding to the shape of the last, is then permitted to set or harden in such shape through the volatilization of the gelatinizing medium. An object of the present invention is the proper conditioning of such blanks at the shoe factory, especially when they are skived, as they usually are, at their vamp line or edge.

The method performed by the apparatus of the present invention involves the passing of a box toe blank edgewise through a pool of the liquid, so that little resistance is encountered by the moving blank, even when substantially all its surfaces are exposed to contact by the liquid. This also means that there is little tendency for the blank to become wrinkled or otherwise distorted during its passage through the pool. After its submersion, the blank is drained, with its tip edge pointing downwardly so as to cause excess liquid to gravitate from its vamp edge downwardly past its tip edge. Such draining is of value, especially in connection with blanks which have been skived at their vamp edges, as in such case the blanks tend to wrinkle and stain the shoe upper when they are handled with an excess of liquid at their thin vamp edges. By causing drainage of excess liquid toward their tip edges, there is less danger of wrinkling and soilage of the shoe upper even when their tip edges carry some excess of liquid. The drainage may take place into the very pool in which submersion of the blanks is effected; and, when the pool contains a volatile liquid, the fumes of the liquid may be kept as an atmosphere about the draining blanks so as to preserve them in the desired limp and mouldable condition. A method such as described may be tied up with a comparatively simple and compact apparatus, which, in accordance with our invention, may be made up generally of a vat for holding the pool of liquid and a blank-holder or carriage, which is supported by a rotary shaft and which is normally at rest above the pool, suitable means being provided to rotate the shaft so as to cause a movement of the carriage and blank into and then out of the pool to a station of rest above the pool. In fact, a pair of carriages for the blanks can be supported at intervals of substantially 180 degrees by the shaft, both being normally at rest above the pool. The shaft can be caused to rotate, as by suitable automatic mechanism brought into play by the operator, through an angle of substantially 180 degrees, and thereby to cause a movement of one carriage and its blank into and then out of the pool to the station above the pool previously occupied by the other carriage and to cause a simultaneous movement of the other carriage to the station where the operator can remove the submersed and drained blank.

With the foregoing and other features and objects in view, the present invention will now be described in greater detail in conjunction with the accompanying drawing, wherein

Figure 1 represents a transverse section through an apparatus embodying the present invention.

Figure 2 is a front view of the apparatus, but partly in section, on the line 2—2 of Figure 1.

Figure 3 is a section through a blank-holder on the line 3—3 of Figure 1.

Figure 4 illustrates conventionally the electric wiring diagram for one form of automatic mechanism which can be employed for turning the shaft 180 degrees in a single step.

Referring more particularly to Figures 1 and 2 of the drawing, 1 designates a vat for holding a pool of volatile liquid, and 2 a pair of vertical standards to which the ends of the vat are secured and terminating in a pair of elongated horizontal angle irons 3 which can be anchored as by bolts to a table or other suitable support. The vat can be conveniently cylindrical and disposed horizontally, as shown. The liquid in the vat is preferably confined from the atmosphere, except for an opening 4 through the front side of the vat immediately above the level of the pool. This level may be kept constant by the progres-

sive feeding of liquid into the pool as it is exhausted as a result of absorption by the blanks or vaporization into the atmosphere. Thus, the pool may be supplied with liquid from a closed tank 5, which is shown resting on a suitable shelf 6 in back of the vat. The tank 5 has a discharge nozzle 7, which opens into a bath of liquid maintained in a shallow trough 8 formed as an extension of the vat 1. When the level of the liquid in the vat drops, a barometric feed of liquid ensues from the tank 5 into the trough 8, from which the liquid flows through a suitable slot 9 in the back side of the vat. Arranged preferably axially within the vat and somewhat above the level of the pool, is a shaft 10, which may be journalled for rotation in the ends of the vat and the standards 2. Extending in opposite directions from the shaft 10 at intervals of substantially 180 degrees, are arms which terminate in holders or carriages for box toe blanks. As shown, these arms can be made up of a pair of spaced bars 11 having a hub 12 midway thereof, secured to the shaft 10. Each blank-holder may consist of a coil spring 13, which is suitably secured between the bars, near their extremities. The securement may, for example, be had at each end of the spring by a bolt 14 whose head 15 engages a washer 16 inserted between two end convolutions and whose threaded shank passes through the bar 11 and is engaged by a nut 17 fastened tightly against the bar. The turns or convolutions of the spring may be closely spaced so as to receive and resiliently grip the flat, rigid blanks inserted therebetween.

The bars 11 are slightly inclined downwardly toward the rear side of the vat, so that, as best shown in Figure 1, a box toe blank 18 can be suspended vertically and edgewise relative to the pool with its tip end in the front holder and at the same time be amply clear of the pool. The blank at this station is adjacent to the opening 4 through the front side of the vat, and is thus in a position to be grasped in a normal way by the operator for assembly with a shoe upper, namely, near its tip edge, whereat there is the least danger of wrinkling. The rear blank-holder is also clear of the pool, but the blank therein is in a draining position, with its tip edge 19 pointing downwardly, so that draining will take place from the vamp edge 20 downwardly past the tip edge into the pool. In other words, when the shaft is rotated 180 degrees to move the front holder and the blank edgewise into and then out of the pool, the blank will be inverted and most of it will project above the spring rather than depend below the spring. When the shaft is then rotated another 180 degrees to bring the drained blank adjacent to the opening 4, the operator can remove the drained blank from its holder and insert a fresh blank therein. When the liquid in the vat is of a volatile nature, as is usually the case in treating blanks stiffened with celluloid or the like, vapors of the liquid accumulate in the substantially confined space above the pool. The vapor atmosphere surrounding the draining blank serves to keep it in the desired limp and mouldable condition over a comparatively long period of time, in fact indefinitely, so long as there is a sufficient supply of volatile liquid in the pool.

Any suitable manual or automatic means can be provided for rotating the shaft 10 in steps of 180 degrees. As shown, one end of the shaft may be coupled to a shaft 21, which derives its motion through suitable gear reducing mechanism in a box 22 from an electric motor 23. The rotation of the shaft 10 may be made to cease after turning 180 degrees by a suitable rotary cut-off ring or switch 24, arranged on the shafts 21 and included in the motor circuit, as diagrammatically illustrated in Figure 4. When the operator wishes to have a treated or conditioned blank presented to him, he pushes a spring switch *a* to the position *b* shown in dotted line, thereby causing the current to flow through the motor, which will turn the shaft 21 only 180 degrees, since the switch *a* springs back to its full-line position so as to cause the current to take the path of the arrows marked *x* through the cut-off ring 24 to the motor. Suitable brushes 25 may contact with the ring, which has non-conducting segments 26 at intervals of 180 degrees. These non-conducting segments cut off the flow of current to the motor and hence stop rotation of the shaft 10 after it has turned 180 degrees. The non-conducting segments 26 are so located as to correspond with a stoppage of the shaft 10 when the blank-holders 13 have reached their normal stations of rest above the pool of liquid, as shown in Figure 1. The motor 23, the box 22, and the switch 24 may be supported on a suitable platform 27 alongside of the vat 1. An advantage of an automatic mechanism over some manual means as might be devised for rotating the shaft 10 through 180 degrees is that it does away with the personal factor and ensures a positive rotation of the shaft each time to bring both holders and their blanks to the desired normal stations of rest above the pool, wherefore the blanks are presented to the operator in the proper condition for assembly with shoe uppers.

The apparatus of the present invention can serve for the conditioning of various kinds of box toe blanks, especially those which respond quickly to the action of solvent or gelatinizing media for the stiffening agent contained therein. Assuming that the box toe blank is one associated with celluloid as the stiffening agent, appearing as an impregnant and/or coating, the liquid solvent or gelatinizing medium used in the apparatus may be amylacetate, acetone, or like volatile solvents or solvent mixtures for this particular stiffening agent. The momentary edgewise immersion which the blanks undergo, coupled with subsequent draining, is compatible with a delivery of the blanks in the desired flat, limp and mouldable condition, even though they are quite porous and absorptive and might under other conditions be delivered too wet for satisfactory handling by the operator and assembly without staining the shoe upper.

The present invention may be extended to so-called water box toes, which, as is well known in the art, are conditioned through immersion in a bath of water. When water serves as the liquid medium for softening and rendering mouldable the stiffener blanks, the apparatus of the present invention may well be modified to the extent that the vat used for holding a pool of water may be open to the atmosphere rather than substantially confined therefrom, as in the embodiment of the invention hereinbefore described.

We claim:

1. Apparatus for treating blanks with a volatile liquid, comprising in combination a vat for holding a pool of said liquid closed generally from the atmosphere but having an opening through one side above the level of said pool, a rotary shaft arranged in said vat above the level of said pool, a pair of arms extending in opposite direction

from said shaft and terminating in holders for said blanks normally above said pool, one of said holders being stationed adjacent to said opening to permit the removal of treated blanks therefrom and the insertion of fresh blanks therein, an electric motor by which said shaft is rotatable, and an electric switch by which said motor is actuable, said motor being designed upon actuation by said switch to rotate said shaft substantially 180° and thereby to cause a movement of the holder adjacent to said opening into and then out of said pool to the station above said pool previously occupied by said other holder and to cause a simultaneous movement of said other holder to the station adjacent to said opening and said motor being equipped with means for effecting its automatic deenergization after its having caused rotation of said shaft substantially 180°.

2. Apparatus for treating flat blanks with a volatile liquid, comprising in combination a generally cylindrical vat disposed substantially horizontally for holding a pool of said liquid confined except for an opening through one side of said vat above the level of said pool, a rotary shaft arranged substantially axially within said vat above the level of said pool, a pair of arms extending in opposite directions from said shaft and terminating in horizontal coil springs arranged above said pool and adapted to receive and grip flat blanks in vertical position between its convolutions, one of said springs being stationed adjacent to said opening to permit the removal of treated blanks therefrom and the insertion of fresh blanks therein, an electric motor by which said shaft is rotatable, and an electric switch by which said motor is actuable, said motor being designed upon actuation by said switch to rotate said shaft substantially 180° and thereby to cause a movement of the spring adjacent to said opening into and then out of said pool to the station above said pool previously occupied by said other spring and to cause a simultaneous movement of said other spring to the station adjacent to said opening and said motor being equipped with means for effecting its automatic deenergization after its having caused rotation of said shaft substantially 180°.

3. An apparatus for treating blanks with a liquid, comprising in combination an enclosed vat for holding a pool of the liquid and having an opening above the liquid level, a rotary shaft, means automatically controlling intermittent rotation of said shaft, carriages for blanks mounted for rotation with said shaft, said intermittent control means moving one carriage through the pool and stopping the shaft with the carriage out of the pool and the blank in draining position thereabove, the next movement of the shaft under influence of said control means carrying another carriage and blank through the pool to draining position and moving said first carriage to bring the blank to a point adjacent said opening.

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