J. G. TUFFORD.

MOLD FOR MAKING RUBBER HEELS.

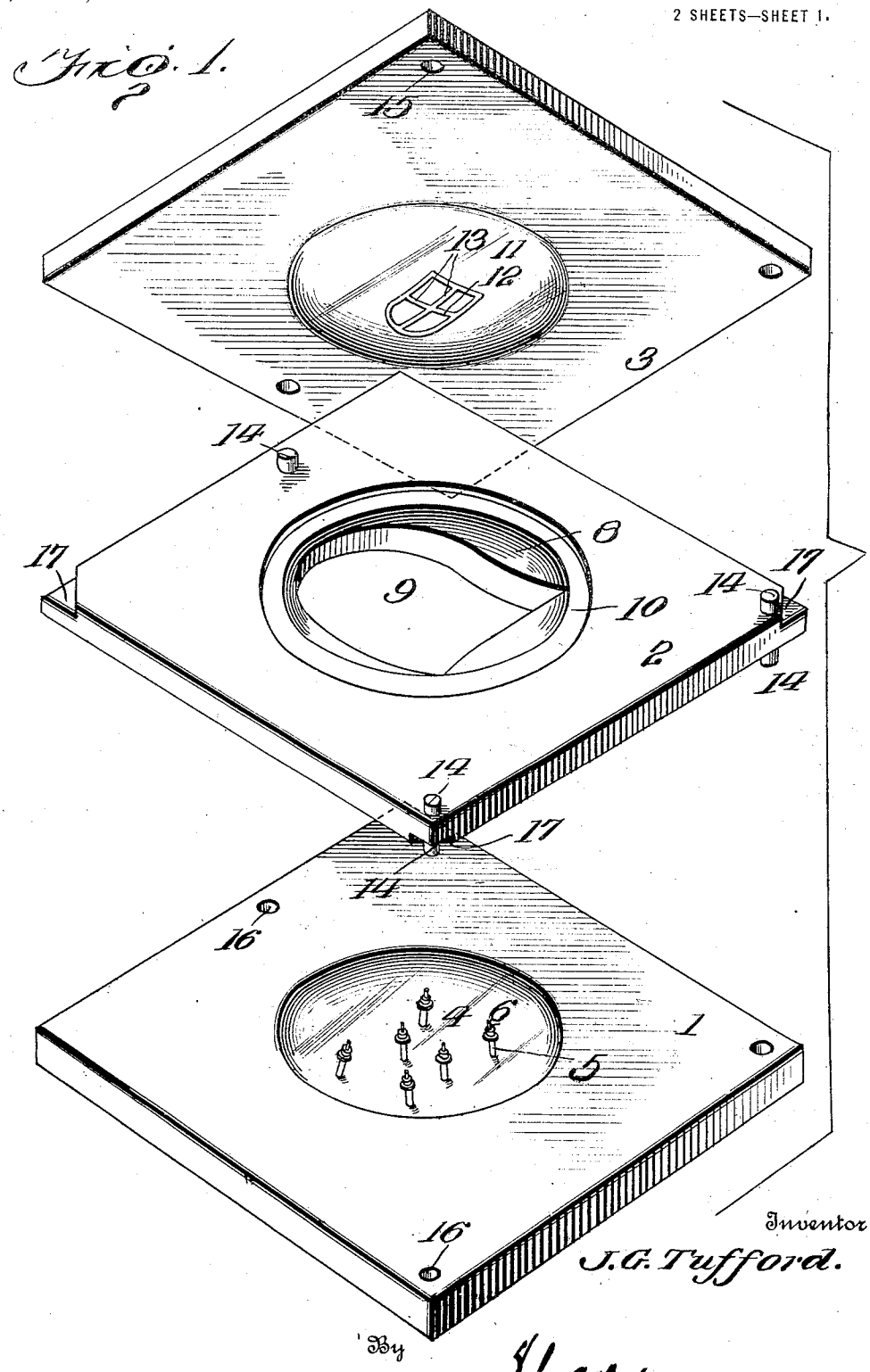
APPLICATION FILED JUNE 22, 1915.

1,177,833.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



Inventor

J. G. Tufford.

By

Attorneys

J. G. TUFFORD.

MOLD FOR MAKING RUBBER HEELS.

APPLICATION FILED JUNE 22, 1915.

1,177,833.

Patented Apr. 4, 1916.

2 SHEETS—SHEET 2.

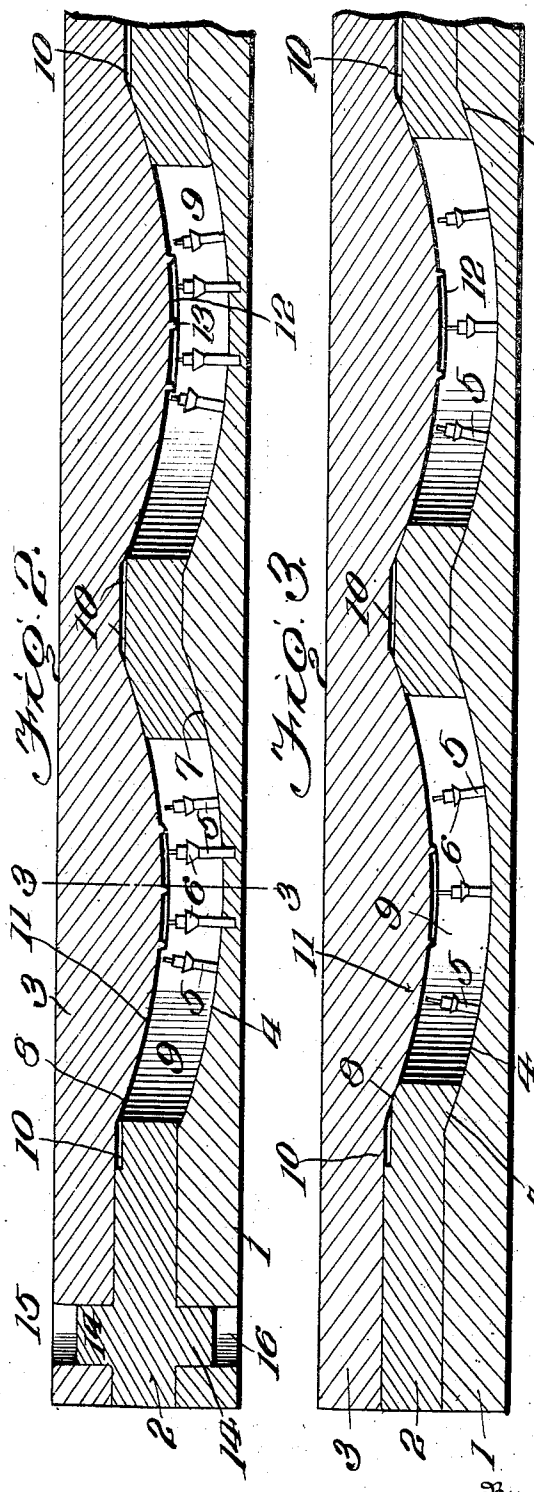


Fig. 2.

Fig. 3.

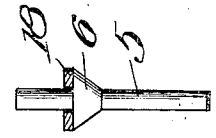


Fig. 5.

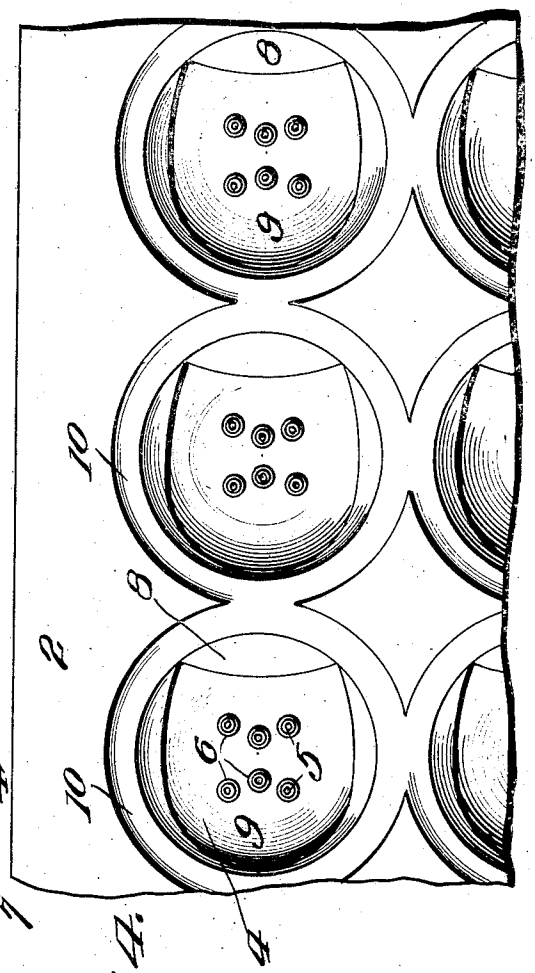


Fig. 4.

Inventor

J. G. Tufford.

By

Attorneys

UNITED STATES PATENT OFFICE.

JOHN G. TUFFORD, OF ELYRIA, OHIO, ASSIGNOR TO THE I. T. S. RUBBER COMPANY, OF ELYRIA, OHIO, A CORPORATION OF OHIO.

MOLD FOR MAKING RUBBER HEELS.

1,177,833. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed June 22, 1915. Serial No. 35,683.

To all whom it may concern:

Be it known that I, JOHN G. TUFFORD, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Molds for Making Rubber Heels, of which the following is a specification.

This invention relates to the manufacture of resilient heels, and has special reference to the method of acting upon the plastic rubber or composition to produce a heel and to the mold employed in the practice of the method.

The object of the invention is to produce a resilient heel which will have its attaching face concave throughout its area whereby, when the heel or lift is placed against the flat under surface of a leather or other shoe heel and pressure applied to the resilient heel or lift, a vacuum or suction cup may be formed whereby the heel or lift will be held to the shoe temporarily until the nails can be applied.

A further object of the invention is to produce a heel which, when applied to a shoe, will have a flat tread surface and which may be equipped with fastening devices so located that the heel can be easily trimmed down to a required size.

Other incidental objects of the invention will appear as the description of the same proceeds.

The invention resides in certain novel features of a mold such as is illustrated in the accompanying drawings and in the method by which the mold is manipulated to produce the article.

In the said drawings: Figure 1 is a perspective view of a mold unit or single type of mold embodying my present invention, the members of the mold being shown disassembled but approximately in their assembled relation; Fig. 2 is a section through an assembled multiple or gang mold taken longitudinally of the shoe heel cavity; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a plan view of a portion of the mold shown in Fig. 2, the top member thereof being removed: and Fig. 5 is a detail view of a slight modification.

In carrying out my invention, I employ a base plate 1, an intermediate plate 2, and a top plate 3, in which are coöperating instrumentalities whereby the complete heel is produced, and these plates may be of such size as to produce merely a single heel, as shown in Fig. 1, or to produce a plurality or gang of heels, as indicated in Figs. 2, 3 and 4. For the sake of convenience, the plates will be referred to more particularly as employed to produce a single heel, but in actual practice I make the plates of such size as to produce a large number of heels at one operation, the number varying according to the size of the heels.

The base plate 1 is provided in its upper surface with a recess or cavity 4 which is a true section of a sphere, and from the concave surface of which rises pins 5 grouped near the deepest point or center of the recess or cavity and provided intermediate their ends with annular shoulders or supports 6. The intermediate plate or mold member 2 is formed on its under side with a convex projection, indicated at 7, of a curvature which will permit it to fit snugly in the concave recess or chamber 4 in the base plate. The upper face of the intermediate member 2 is provided with a circular depression or recess, indicated at 8, and this concave circular recess or depression alines axially with the convex projection 7 on the under side of the plate. A central opening 9 is formed through the intermediate plate or mold member, and this opening 9 has an outline corresponding to the usual outline of a shoe heel or lift. The said intermediate plate or mold member is further provided in its upper face with a shallow circular overflow cavity or recess 10, the purpose of which will presently appear. The top plate or mold member 3 is provided on its under side with a convex projection 11 the convex surface of which is a true section of a sphere and an exact complement of the concave chamber or recess 4 and adapted to fit in the concave depression 8 of the intermediate member. Upon the apex or deepest portion of this convex projection 11, I provide ribs 12 which preferably define a space of the same shape as a shoe heel and extend parallel or concentric with the walls of the opening 9. Within the space so defined, I provide intersecting ribs 13, the purpose of which will presently appear.

In the practice of the invention, the several plates or mold members are superimposed, as indicated in Figs. 2 and 3, and to cause them to aline with exactness, the in-

termediate plate is provided on both its upper and lower surfaces with studs or lugs 14 adapted to engage openings or sockets 15 and 16 in the top plate and the base plate, respectively. The plastic rubber frequently overflows to such an extent as to collect in the openings or sockets 15 and 16 and cause the lugs 14 to bind in the same so that the several mold members tend to bind together, and to facilitate the separation of the said members, when it is desired to remove the formed heels, I provide the notches or cut-away portions 17 in the edge of the intermediate member and preferably at the corners of the same. It will be readily understood that any convenient tool may be easily inserted in the said notches or recesses so as to prv the members apart and overcome the adhesion of the rubber which may have collected around the studs or lugs 14 and in the sockets 15 and 16.

In producing rubber or other resilient heels by my improved method, the base plate 1 and the intermediate plate 2 are assembled in their proper positions, as will be understood on reference to Figs. 2 and 3. Small metallic washers, indicated at 18, are slipped over the ends of the pins 5 so as to rest upon the shoulders 6 and project beyond the edges of said shoulders either before or after the said plates are assembled, and rubber or composition is then placed in the chamber formed by the cavity 4 and the opening 9 so as to completely fill the said opening. The top plate is then placed in position over the intermediate plate with its convex projection 11 entering the depression 8 and bearing directly upon the plastic mass in the opening 9. The plates are steam heated at all times so as to be maintained at a high temperature, and after the several plates or mold members are assembled, pressure is applied to the plates by means of a hydraulic press or other machine so that the plastic mass in the opening 9 will be compressed and solidified, the heat of the plates serving to vulcanize the mass to such an extent that it will be rendered very tough and durable but, at the same time, will retain its resiliency.

After an interval sufficient to permit the desired vulcanization of the mass, the several plates are separated, the top plate and intermediate plate being removed from the base plate and the top plate being removed from the intermediate plate. As the intermediate plate is lifted from the base plate, the formed heel will remain in the opening 9 and will withdraw from the base plate with the intermediate plate. The washers 18 will be embedded in the heel and will slip from the pins 5 as the heel is withdrawn, the body of the heel expanding toward its center as it leaves the said pins 5 so that in the finished heel the said openings will be barely large enough to admit a heel securing nail or other fastening. After the plates have been thus separated, blows are delivered upon the formed heels so as to knock them from the openings 9, as will be readily understood. In order to assure the proper density in the finished heel, the openings 9 should be completely filled, and it will be readily understood that, as the edges of the openings are above the centers of the same, as shown in Figs. 2 and 3, the plastic mass will seek a level corresponding with the horizontal plane of the edges of the opening. There will thus be some surplus material which will be forced over upon the upper side of the intermediate plate when pressure is applied thereto through the top plate, and this overflow will be accommodated in the annular recess or overflow cavity 10 so that, when the heel is withdrawn or ejected, a thin lateral fin will be presented at the top of all its edges. This fin is, of course, trimmed off before the heel is placed on the market. The provision of the groove 10 to accommodate this overflow tends to reduce the liability of the top and intermediate plates sticking together and also permits the convex projection on the top plate to enter positively into and fill the depression or cavity in the intermediate plate.

The ribs 12 and 13 upon the top plate will, of course, produce grooves in the upper face of the heel, and these grooves will mark off separate suction areas at the center of the heel, while, at the same time, the entire upper attaching face of the heel will form a suction area so that the heel may be readily placed in position upon a shoe and will set positively in its position while nails or other fastening devices are being driven through the openings formed by the pins 5. The heel produced by my method and in my mold will have a concave attaching face and a convex tread face throughout its area and, when it is placed against a flat shoe heel, a sharp blow delivered thereon will flatten its opposite faces so that the air contained between the attaching face of the rubber heel or lift and the leather surface of the shoe will be driven out and the rubber heel or lift held to the shoe by the suction thus produced. A very close fit will be had between the edge of the rubber heel and the face of the leather heel so that fine sand or dirt cannot work in over the rubber heel and cut away the same. The rubber heel or lift is positively secured to the shoe by means of nails or similar fastenings driven through the openings therein, and these openings will immediately contract around the said nails or other devices so that there will be no cavity exposed in which dirt can collect and cut away the rubber. The pins 5 converge on radii of the arcs described by the concavity from which they rise and the

openings thereby formed in the heel, therefore, converge toward the concave or attaching face thereof. Consequently, when the heel is flattened against a shoe, the said openings are brought into parallel relation so that the nails driven through them will enter the shoe heel perpendicularly.

As shown in Figs. 1 to 4, the upper extremities of the pins 5 are reduced so that the formed heel may readily slip therefrom and the openings formed in the heel will be so small that, when fastenings are driven through them, the body of the heel will be compressed and closely adhere to the fastening. The pins, however, may be of uniform diameter throughout their length and I have illustrated such a construction in Fig. 5.

Having thus described the invention, what is claimed as new is:—

1. A mold including assembled parts, one of which is provided with a molding chamber having the general outline of a heel lift and having its surface around said chamber concave, one wall of the molding chamber being concave and provided with washer supporting devices, and another part of the mold being provided on one side with a convex projection forming the opposed wall of the molding chamber and conforming to and adapted to coact with the said concave surface.

2. A mold including a base member, and a top member, and provided with a molding chamber having the general outline of a heel lift, the bottom wall of the molding chamber being concave and provided with washer supporting devices, and the mold being further provided with a concave upper surface surrounding the side wall of the molding chamber at the upper end thereof, the top member being provided on its lower side with a projection forming the top wall of the molding chamber and having a convex surface conforming to and adapted to coact with said concave upper surface, the concave bottom wall of the molding chamber and the convex surface of the projection on the top member being each a true section of a sphere.

3. A mold including a base member, and a top member, and provided with a molding chamber having the general outline of a heel lift, the bottom wall of the molding chamber being concave, washer supporting pins projecting upwardly from the bottom wall of the molding chamber and converging on radii of arcs described by the concavity from which they rise, the top member being provided on its lower side with a projection forming the top wall of the molding chamber and having a convex surface, the concave bottom wall of the molding chamber and the convex surface of the projection on the lower side of the top member being each a true section of a sphere.

4. A mold comprising a plurality of superposed members, the lowest member having a recess in its upper face which is concave throughout its entire area and the upper member having a convex projection on its under side adapted to register with the concave recess in the lower member, an intermediate member having its upper surface concave and its lower surface convex, the said concavo convex portion of the intermediate member being pierced by an opening having an outline corresponding to the outline of a heel lift, and washer supporting pins rising from the bottom wall of the concave recess in the lowest member and converging on radii of arcs described by the concavity from which they rise.

5. A mold comprising a base member having a concave recess in its upper side and having pins within the recess provided with annular shoulders intermediate their ends, an intermediate member having a convex projection on its under side adapted to fit closely within said concave recess in the base member, said intermediate member being also formed with a concave recess in its upper side and having an opening therethrough of the outline of a heel lift and adapted to fit over and around the pins on the base member, and a top member having a projection on its under side provided with a convex surface adapted to fit in the concave recess in the intermediate member, the concave recess in the base member and the convex surface of the projection on the top member being each a true section of a sphere.

6. A mold comprising superposed members, the lowest member having a concave recess in its upper side, the intermediate member having an opening therethrough and provided on its under side with a convex projection fitting the concave recess in the lowest member and provided in its upper side with a concave recess similar to the recess in the lowest member, and the top member having a projection on its under side fitting the concave recess in the intermediate member, the opposed surfaces of the recess in the lowest member and the projection on the top member being spaced apart throughout their extent a distance equal to the thickness of the walls of the opening in the intermediate member.

7. A mold including parts which when assembled form a molding chamber having a side wall of the general outline of a heel lift, a bottom wall and a top wall, the bottom wall of the chamber being concave, one of the assembled parts having a concave surface surrounding the upper edge of the side wall of the molding chamber, and another of said assembled parts being provided with a convex projection forming the top wall of the molding chamber, the marginal por-

tion of said convex projection conforming to and coacting with the concave surface surrounding the molding chamber.

8. A mold comprising a base member having a concave recess in its upper side and having washer supporting pins within said recess and converging on radii of arcs described by the concavity from which they rise, an intermediate member having a convex projection on its under side adapted to fit closely within said concave recess in the base member, said intermediate member being also formed with a concave recess in its upper side and having an opening therethrough of the outline of a heel lift and adapted to fit around the pins on the base member, the upper side of said intermediate member being provided with an overflow cavity surrounding the opening therein, the top member having a convex projection on its under side adapted to fit the concave recess in the intermediate member.

9. A mold for forming resilient heels comprising a base member having a concave recess in its upper side and having pins within said recess provided with annular shoulders intermediate their ends, an intermediate member having a convex projection on its under side adapted to fit closely within the said concave recess in the base member, said intermediate member being also formed with a concave recess in its upper side and having an opening therethrough of the outline of a shoe heel and adapted to fit over and around the pins on the base member, and a top member having a convex projection on its under side adapted to fit in the concave recess in the intermediate member and provided with ribs adapted to extend into the opening in the intermediate member.

10. A mold for forming resilient heels comprising a base member having a concave recess therein, an upper member having a convex projection on its lower face registering with the concave recess in the base member, an intermediate member having its upper surface conforming to the convex projection of the upper member and its lower surface conforming to the wall of the concave recess in the base member, said intermediate member being pierced by an opening having the general outline of a shoe heel, the concave portion of the base member being provided with washer supporting pins projecting within the opening and converging on radii of arcs described by the concavity from which they rise, the upper member and base member being provided with recesses or sockets, studs on the intermediate member adapted to engage said sockets and tool receiving notches in the edges of the intermediate member.

11. A mold for forming heel lifts including assembled parts, one of which is provided with a molding chamber having the general outline of a heel lift, one wall of the molding chamber being concave and the opposed wall of said chamber having a convex surface coacting with said concave wall, one of said walls being provided with washer supporting devices.

12. A mold for forming heel lifts including a base member, and a top member, and provided with a molding chamber having the general outline of a heel lift, one wall of the molding chamber being concave and the opposed wall thereof being provided with a convex surface coacting with the concave wall, one of said walls being provided with washer supporting devices projecting within the molding chamber and disposed on radii of arcs described by the surface from which they project.

In testimony whereof I affix my signature.

JOHN G. TUFFORD. [L. S.]