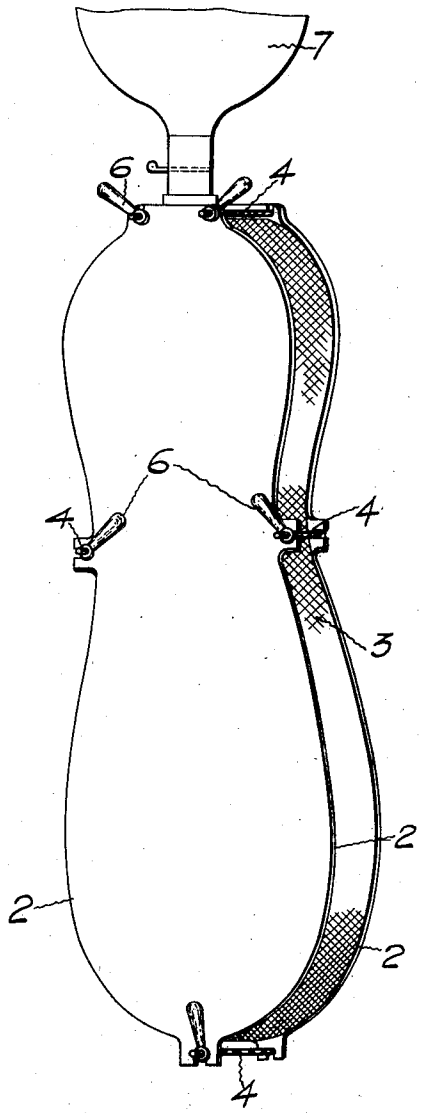
April 5, 1927. 1,623,933

P. BEEBE

APPARATUS FOR AND METHOD OF MAKING ARTICLES FROM A FIBROUS COMPOSITION

Filed Sept. 16, 1922




FIG, 1.


FIG, 2.

INVENTOR

PAUL BEEBE

BY

R.O. Mosher

ATTORNEY

Patented Apr. 5, 1927.

1,623,933

# UNITED STATES PATENT OFFICE.

PAUL BEEBE, OF AKRON, OHIO, ASSIGNOR TO THE GOODYEAR TIRE & RUBBER COMPANY, OF AKRON, OHIO, A CORPORATION OF OHIO.

## APPARATUS FOR AND METHOD OF MAKING ARTICLES FROM A FIBROUS COMPOSITION.

Application filed September 16, 1922. Serial No. 588,641.

My invention pertains to a novel type of apparatus for, and a method of, making articles from a fibrous composition, and it has particular relation to the manufacture of articles of the character designated in which it is desired that the fibers be disposed in a definite predetermined arrangement.

The object of my invention is to provide a novel apparatus for, and method of, producing material of the character above designated, by molding, and which shall obviate the wastage of material.

Heretofore, it has been customary, in the manufacture of fibrous material adapted for use as soles of shoes, to manufacture the material in large sheets and to cut the soles therefrom. On account of the irregular shape of soles, this method has resulted in the wastage of a relatively large proportion of the material. By my invention I have provided a method of manufacture which eliminates this wastage, and also produces a material in which the fibers are disposed in planes substantially perpendicular to the wearing surface, thus providing a material of very good wearing qualities. The present invention is practiced preferably in conjunction with the process disclosed in my copending application Serial Number 622,453.

In the accompanying drawings:

Fig. 1 is a perspective view of a mold which I employ in practicing my invention; and

Fig. 2 is a cross-sectional view, on an enlarged scale, illustrating the disposition of the fibers in the finished product.

The mold consists of two spaced sheet metal members 2, each of which is of a similar contour to the article it is desired to form, in this instance a shoe sole. The plates 2 are connected together by means of a porous or screen member 3, which engages the entire periphery of the members 2. The plates 2 are held in their proper position with respect to each other by means of supporting members 4 disposed thereabout in spaced relation, which are provided with latches 6 disposed at each end thereof.

One of the supports 4 has associated therewith a conduit 7 which opens into the mold and communicates with a tank or container, not shown, for the fibrous material. With the latches 6 in their locked positions a quantity of liquid, having suspended therein a quantity of fibers, is forced into the mold through the conduit 7. The liquid is passed into the mold at a relatively low rate of speed. After being admitted to the mold, the liquid flows to the porous side walls 3 and passes therethrough, leaving the fibers disposed in engagement therewith. The fibers may initially engage the screen in a position perpendicular thereto. However, the pressure of the slowly moving material in the mold gradually forces the fibers down in planes substantially perpendicular to the plates 2. Thus the fibers are forced from their initial position before any other fibers are disposed in side-by-side engagement therewith to render any support thereto.

The liquid is forced into the mold through the conduit 7 until the entire mold is filled with the fibrous material, the liquid in which the material was suspended having passed through the screen wall 3. Owing to the slow movement of the liquid, the fibers will all be arranged in planes perpendicular to the plates 2, and thus normally to the ultimate wearing surface of the sole.

It will be apparent from this description that the entire mass of fibers will be collected and formed into a sole without any wastage whatsoever. Also it will be obvious that the fibers will be arranged in a vertical position with respect to the top and bottom of the sole, which provides a very good wearing surface and offers a very high resistance to the splitting of the material into layers.

After the molded fibers are removed from the mold, they are subjected to pressure applied on the top and bottom thereof to compress the same to the desired thickness. The pressure on the ends of the fibers causes a portion of them to bend and buckle, as illustrated at 8 in Fig. 2, thus providing additional interlocking and felting of the fibers. This serves to increase the tearing strength of the material without injuring its wearing qualities.

While I have illustrated only one form which my invention may assume and have described in detail but a single application thereof, it will be obvious to those skilled in the art that it is not so limited, but that various minor modifications and changes may be made therein without departing from

the spirit of my invention or from the scope of the appended claims.

What I claim is:

1. Apparatus for making molded articles which comprises two spaced non-porous plates of contour similar to the article to be formed, said plates being connected at the edges by means of a screen.

2. Apparatus for making a shoe sole which comprises two spaced non-porous plates of contour similar to a shoe sole, said plates being connected at the edges by means of a pourous member.

3. Apparatus for making a shoe sole which comprises two spaced non-porous plates having a contour similar to that of a shoe sole, said plates being connected together at the edges by means of a screen, and means for admitting a liquid into the mold.

4. A method of forming a fibrous leather substitute from a suspension of fibrous material that comprises depositing suspended material on a foraminous surface disposed perpendicularly to the wearing surface of the fibrous product.

5. A method of making artificial leather material consisting of rubberized fibrous composition that comprises forming a suspension of rubberized fibers in a fluid medium, removing the suspending medium by filtering it through a foraminous surface disposed perpendicularly to the surface of the product, thereby depositing the fibers in planes perpendicular to the wearing surface of the product and vulcanizing the deposited product.

6. The method of making shoe soles from fibrous material which comprises forcing a quantity of liquid having fibers suspended therein through a screen of relatively fine mesh disposed in planes substantially perpendicular to the wearing surface of the shoe sole.

In witness whereof, I have hereunto signed my name.

PAUL BEEBE.