

I. H. VENN.
LEATHER CUP.
APPLICATION FILED SEPT. 25, 1902.

956,612.

Patented May 3, 1910.

Fig. 1.

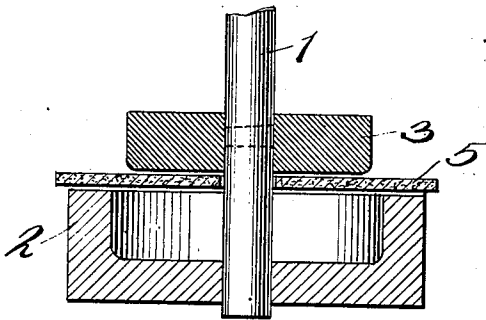


Fig. 3.

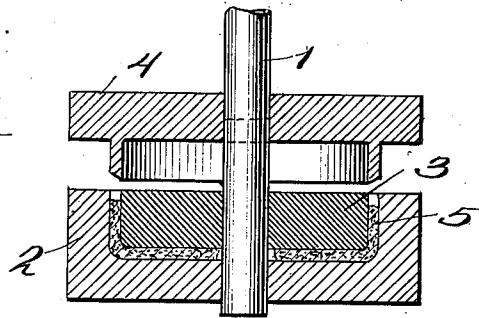


Fig. 2.

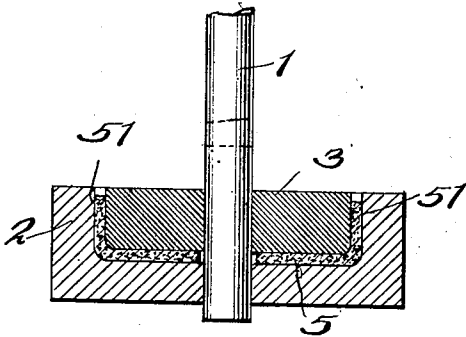
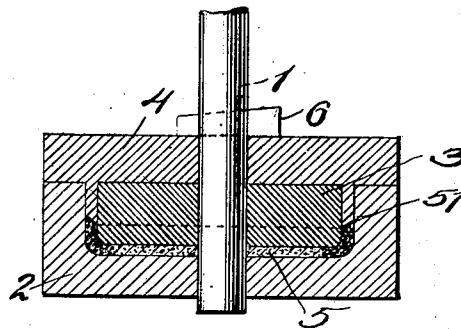


Fig. 4.



WITNESSES:

T. J. Lane
David W. Austin Jr.

INVENTOR

Isaac H. Venn
BY
Ernest W. Marshall
ATTORNEY

UNITED STATES PATENT OFFICE.

ISAAC H. VENN, OF YONKERS, NEW YORK, ASSIGNOR TO OTIS ELEVATOR COMPANY,
OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LEATHER CUP.

956,612.

Specification of Letters Patent.

Patented May 3, 1910.

Application filed September 25, 1902. Serial No. 124,864.

To all whom it may concern:

Be it known that I, ISAAC H. VENN, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have made a certain new and useful Invention in Leather Cups, of which the following is a specification.

This invention relates to cups or packing of fibrous material, such as are used for packing the pistons of slide valves and similar devices.

The object of the invention is to provide a cup or packing of leather or other fibrous material, which is simple, efficient and economical.

A further object of the invention is to provide a leather cup wherein the peripheral portion of the cup is compressed, upset and solidified, thereby strengthening the same at the point where greatest wear is imposed when in use.

Other objects of the invention will appear hereinafter, the novel combinations of elements being set forth in the appended claims.

In the accompanying drawings, Figures 1, 2, 3 and 4 represent respectively in sectional elevation the parts which may be employed in carrying out the novel process for the production of my invention. This process is fully described and claimed in my co-pending application, Serial No. 300,981, filed February 14, 1906, for an improvement in processes for making leather valve cups.

In the ordinary practice of making leather cups such as are employed for packing pistons of slide valves, and in similar relations, a piece of leather, after being softened, is compressed or drawn into the desired shape between suitable molds. In the operation of forming or drawing the leather into the desired shape to form the cup, a petticoat or flange forms at the peripheral edge of the cup, and hence the portion upon which is imposed the greatest wear when the device to which the cup is applied is in operation is drawn out or stretched, and consequently is weakened. Moreover, when such cups are removed from the molds the peripheral edge thereof is ragged and requires to be trimmed off before the cup is in condition for use. It is among the special purposes of my present invention to avoid these objections, and hence in accordance with the principles of my invention I purpose to compress and

thereby upset and solidify the body of the cup, principally at or adjacent the peripheral edge thereof, and therefore at the point where the petticoat or flange thereof is formed, thereby rendering the portion of the cup where the greatest wear occurs when in use stronger and in better condition to resist such wear. I also purpose to form the peripheral edge in such manner as to avoid the necessity for the subsequent trimming of the same.

I have shown as an illustration means for accomplishing the desired object, and will describe the method of carrying my invention into practical operation, but I do not wish to be limited to any particular means or method, as these results may be accomplished in many specifically different ways. It should be understood that the claims here-appended cover the product, viz., a packing or cup having certain characteristics, and that in my co-pending application hereinbefore referred to I have covered the method or process of producing this product.

In the accompanying drawings, 1 designates a pin or mandrel, the diameter of which is the same as that desired for the central hole in the finished cup.

2, 3 and 4 are mold blocks which may be employed for forming a blank of fibrous material into the desired shape to form the cup, and for compressing, upsetting and solidifying or hardening the peripheral edge thereof.

If a circular cup of leather is desired, a disk 5 is cut to the desired diameter and a central hole is formed therein of somewhat larger diameter than the pin or mandrel on which the disk is strung. The leather after being softened in any convenient way, as by soaking the same in water, is placed between the molds 2 and 3 as indicated in Fig. 1. The molds are then forced together and the leather 5 pressed into the shape of a cup as indicated in Fig. 2. Of course it should be understood that the molds may be of any desired shape, depending upon the shape of the cup to be produced.

During the operation of forming the softened leather disk into the desired shape, the portion 51 of the disk adjacent the peripheral edge thereof is stretched by the action of drawing the same into the mold 2, thereby reducing the material in thickness and

leaving the peripheral edge thereof roughened. To obviate these objections in accordance with the principles of my invention, I employ a mold part 4 shown in Fig. 3, which in this instance is provided with a lateral ring or flange so shaped as to fit closely between the molds 2 and 3. The outer portion or peripheral edge of the ring or flange is preferably beveled to correspond to the desired shape to be given to the peripheral edge of the finished cup. Now, while the cup is held in shape by the molds 2 and 3 and form lateral expansion beyond a predetermined degree as shown in Figs. 2 and 3, the mold 4 is applied and pressed firmly into place as shown in Fig. 4. By this means the peripheral portion 51 of the cup is smoothed and shaped to the desired bevel, while at the same time the portion of the cup surrounding the central hole is crowded radially toward or upon the mandrel 1, thereby reducing the hole or opening formed centrally through the cup to the desired size or diameter.

It will be seen that the mold blocks 2 and 3 are concentrically arranged on the pin 1 so that while the leather is being compressed by the cylindrical or flange mold 4, the leather can expand laterally at its peripheral portion only to a limited extent, and in some instances not at all, depending upon the width of the annular opening between the molds 2 and 3. It may be said that the leather cup is upset or reduced in size throughout by reason of the bottom portion being crowded toward the center, and it is very evident from an inspection of Fig. 4 that the peripheral portion or flange of the cup is shortened or upset to condense the same to a greater extent than the bottom portion. Preferably the molds will be left together in the position shown in Fig. 4 until the leather becomes dry. If desired, the molds may be heated to hasten the drying. When the drying is completed, the molds may be separated and the finished cups removed. It should be noted that the finished article is integral throughout and has a rim of increased material and of greater density and strength than its remaining portions. The molds are preferably so constructed that the rim portion of the cup will have substantially the same thickness throughout, and this thickness may be substantially the same as that of the flat or bottom portion, or it may be slightly thicker if desired. It should be noticed that in each of the figures an opening through the mandrel 1 is shown in dotted lines, and that this opening is wider at the right than at the left. As indicated in Fig. 4, a wedge 6 is intended to be inserted through this opening after the mold block 4 has been brought to proper position so that the mold blocks may be held together while the packing is drying. This implies,

of course, that the mold block 2 is fastened to the mandrel 1 so as to have no movement longitudinally of the same, although it may have circumferential motion thereon. After the packing has been compressed a sufficient length of time, the wedge 6 may be removed and then the molds taken apart so that the packing may be removed. The mold blocks may be held together by other devices, if desired.

From the foregoing description it will be seen that I provide an exceedingly simple and efficient cup and in a most economical manner, the cup being strengthened at the portion which receives the greatest amount of wear, and the same device which is used to upset the cup also effects a smooth beveled edge for the cup.

Having now set forth the objects and nature of my invention and the manner in which it may be produced, what I now claim as new and of my own invention and desire to have protected by Letters Patent of the United States is:—

1. As an article of manufacture, a packing having its peripheral portion upset and solidified.

2. As an article of manufacture, a dried leather packing cup having its peripheral portion upset and solidified.

3. As an article of manufacture, a packing cup having a smooth peripheral edge and the peripheral portion upset and condensed.

4. As an article of manufacture, a cup-shaped leather packing with a bottom having a central opening and a cylinder or wall portion hardened, compressed or solidified to a greater extent than the said bottom.

5. As a new article of manufacture, a leather cup having its peripheral flange upset and solidified.

6. A cup-shaped article of fibrous material integral throughout, and having a rim of increased material and of greater density and strength than its remaining portions but of the same thickness as the latter.

7. As a new article of manufacture, a leather packing cup having a central hole or opening therethrough and having the body portion solidified and upset radially toward said central hole.

8. In the manufacture of cup-shaped articles, the process which consists in shaping into a cup fibrous material integral throughout, and subjecting the rim to pressure by holding the same from lateral expansion to crowd the material into a smaller space, thereby increasing the density and strength without substantially changing the thickness of any portion of the cup.

9. In the manufacture of cups, the process which consists in forming softened material into the desired shape to form a cup, and then applying an edgewise pressure thereto

while its peripheral portion is held from lateral expansion.

10. In the manufacture of packing cups, the process which consists in softening a blank of suitable material formed with a central hole therein, changing said blank into a cup and finally applying edgewise pressure to the cup while held in shape to condense and compress the same radially.

11. In the manufacture of packing cups, the process which consists in shaping into a cup a piece of fibrous material integral throughout, and then compressing the rim to increase the density thereof so as to have increased material therein, and transmitting pressure to the remaining portion of the cup to increase its strength without varying its thickness.

12. In the manufacture of leather packing cups, the process of shaping into a cup a piece of leather between molds, and then subjecting the peripheral portion of the cup to pressure by placing an additional mold between said first-named molds to upset said

portion, condense the same, and to form a smooth edge.

13. In the manufacture of packing cups, the process which consists in placing a blank having a hole in its center over a pin of less diameter than the hole and between molds on said pin to form a cup, and then applying a ring or flange mold to the peripheral portion of the cup to reduce the diameter of the hole to that of the pin, and to smooth the peripheral edge and to upset and condense the cylindrical portion of the cup while held from lateral expansion, and finally heating the cup to dry and harden or solidify the same.

In testimony whereof, I have signed my name to this specification in the presence of the subscribing witnesses.

ISAAC H. VENN.

Witnesses:

JAMES S. FITCH,
J. SULTZER,
WM. D. STIVERS.