No. 685,095. Patented Oct. 22, 1901.

G. BROWNING & C. E. BOUTWOOD.

MOLDING OR FORMING APPARATUS.

(Application filed Feb. 7, 1901.)

(No Model.)

Fig. 1.

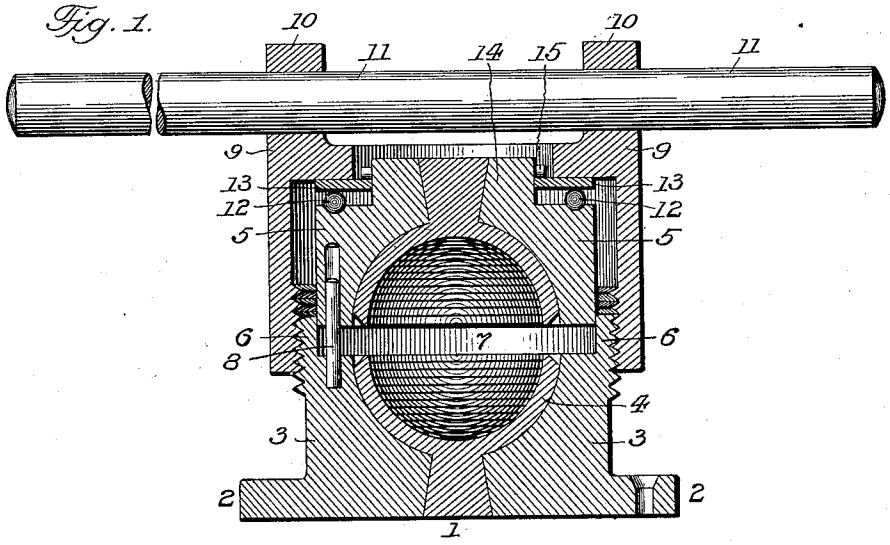


Fig. 2.

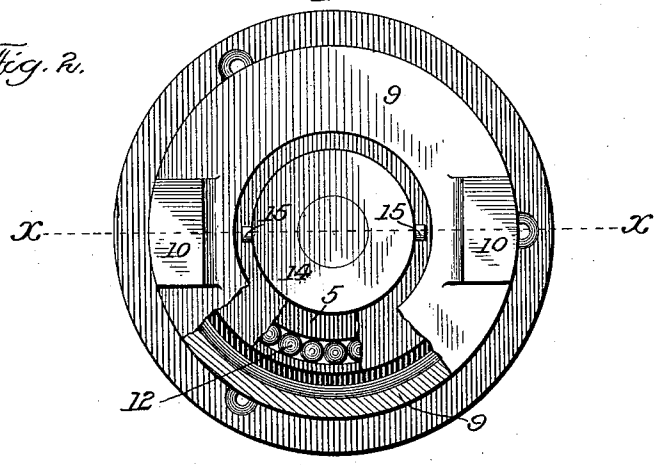
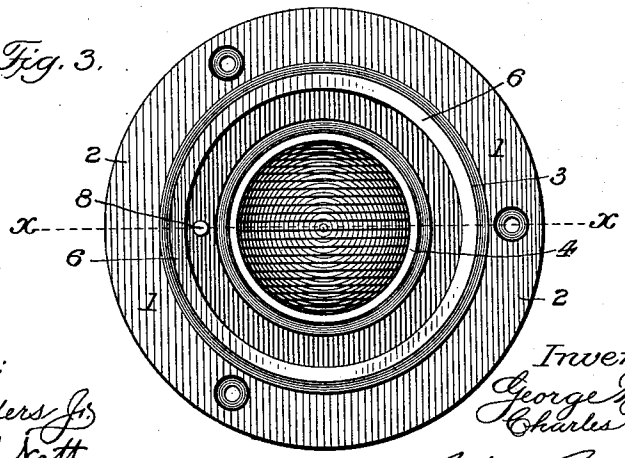


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE BROWNING, OF HINSDALE, AND CHARLES EDWARD BOUTWOOD, OF ROGERS PARK, ILLINOIS.

MOLDING OR FORMING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 685,095, dated October 22, 1901.

Application filed February 7, 1901. Serial No. 46,301. (No model.)

To all whom it may concern:

Be it known that we, GEORGE BROWNING, a subject of the King of Great Britain, residing at Hinsdale, in the county of Dupage, and CHARLES EDWARD BOUTWOOD, a citizen of the United States, residing at Rogers Park, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Molding or Forming Apparatus, of which the following is a specification.

The present invention relates to that class of molding or forming apparatus in which the mass or body of the required material in a heated state is pressed between dies or molds into the finished shape of the article required.

The object of the present improvement is to provide a simple, compact, and efficient apparatus capable of easy manipulation and affording with safety a very high pressure upon the mold or die sections and which, while of special application to the manufacturing and finishing of golf-balls, is also capable of useful adaptation to the manufacture of other articles for rubber or other allied plastic compositions by the employment of pressure alone or pressure combined with a vulcanizing action, all as will hereinafter more fully appear, and be more particularly pointed out in the claims. We attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional elevation of the present improved apparatus at line $x\,x$, Figs. 2 and 3; Fig. 2, a plan view of the same with parts broken away; Fig. 3, a plan view of the lower fixed member of the apparatus.

Similar numerals of reference indicate like parts in the different views.

Referring to the drawings, 1 represents the lower and fixed member of the apparatus, formed with an attaching flange or base 2, a cylindrical body portion 3, the upper end of which is exteriorly screw-threaded, and a hollow central portion which may be either formed in a direct manner into the shape of the article to be molded, but preferably adapted to receive a filling 4, of Babbitt or other like more flexible metal, which filling is chambered out to form the stationary mold or die proper of the apparatus, as shown.

5 is the upper and movable member of the apparatus, of a cylindrical form, the lower end of which is adapted to move in and be guided by an annular neck or extension 6 of the lower or fixed member 1 in manner to insure rectilinear movement of the one member with relation to the other. Such upper and movable member, as in the case of the lower and fixed member 1, will be formed with a central mold-cavity, which may be formed either in a direct manner in the metal of the member 5, but preferably by a filling or lining 7, of Babbitt or other like more fusible metal, which filling is chambered out in any usual manner to form the movable mold or die proper of the apparatus.

8 is a dowel-pin on one of the members engaging a corresponding hole in the other member to prevent an independent turning movement of one member with relation to the other.

9 is a cap-shaped compression-nut formed with an annular depending skirt internally screw-threaded and adapted to engage the screw-threaded exterior of the lower or fixed member 1 of the apparatus and with a pair of vertically-projecting side ears 10 for the passage of the capstan bar or lever 11, by which the said compression-nut is forcibly rotated in the operation and use of the present apparatus.

12 represents a series of balls interposed between the upper or head portion of the compression-nut 9 and the upper surface of the movable member 5, with a view to reduce the frictional contact between the two parts in an independent rotation of the compression-nut. In our preferred construction, 13 is an interposed bearing-ring loosely connected to a central vertical extension 14 of the movable member 5 by means of confining-pins 15. With such arrangement the balls are confined and held in the track-race therefor in the top surface of the movable member 5, while at the same time the said bearing-ring is free to rotate with the compression-nut 9 in its rotation independent of the said movable member 5.

It is within the province of our present invention to modify the particular shape of the parts shown in the drawings as the judgment of the constructor may deem best to suit the

particular use or manufacture to which the present apparatus is applied.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member having a substantially counterpart construction, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, and means for rotating the compression-nut, substantially as set forth.

2. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member having a substantially counterpart construction, a dowel-pin on one member, an orifice in the other member receiving said dowel-pin, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, and means for rotating the compression-nut, substantially as set forth.

3. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member of a substantially counterpart construction and having a cylindrically-formed body, an annular neck or extension on the fixed member forming a guide for the lower end of the movable member, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, and means for rotating the compression-nut, substantially as set forth.

4. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member having a substantially counterpart construction, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, a series of bearing-balls interposed between the compression-nut and the movable member, and means for rotating the compression-nut, substantially as set forth.

5. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member having a substantially counterpart construction, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, a series of bearing-balls interposed between the compression-nut and the movable member, a bearing-ring interposed between the series of balls and the compression-nut and secured to the movable member against disengagement, and means for rotatating the compression-nut, substantially as set forth.

6. In a molding or forming apparatus of the character herein described, the combination of a fixed member formed with a central mold or die cavity and a cylindrical body externally screw-threaded, a movable member having a substantially counterpart construction, a compression-nut engaging the movable member and having a depending annular skirt internally screw-threaded and having engagement by means of said skirt with the fixed member, a series of bearing-balls interposed between the compression-nut and the movable member, a bearing-ring interposed between the series of balls and the compression-nut and secured to the movable member against disengagement by means of a central extension on the movable member, and confining means engaging said extension above the bearing-ring, and means for rotating the compression-nut, substantially as set forth.

In testimony whereof witness our hands this 2d day of February, 1901, at Chicago, Illinois.

GEORGE BROWNING.
CHARLES EDWARD BOUTWOOD.

In presence of—
HENRY A. NOTT,
ROBERT BURNS.