

March 17, 1936.

J. T. RIDDELL

2,034,249

METHOD OF MAKING LEATHER BALLS

Filed Dec. 18, 1933

2 Sheets-Sheet 1

Fig. 1

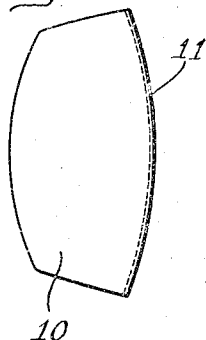


Fig. 2

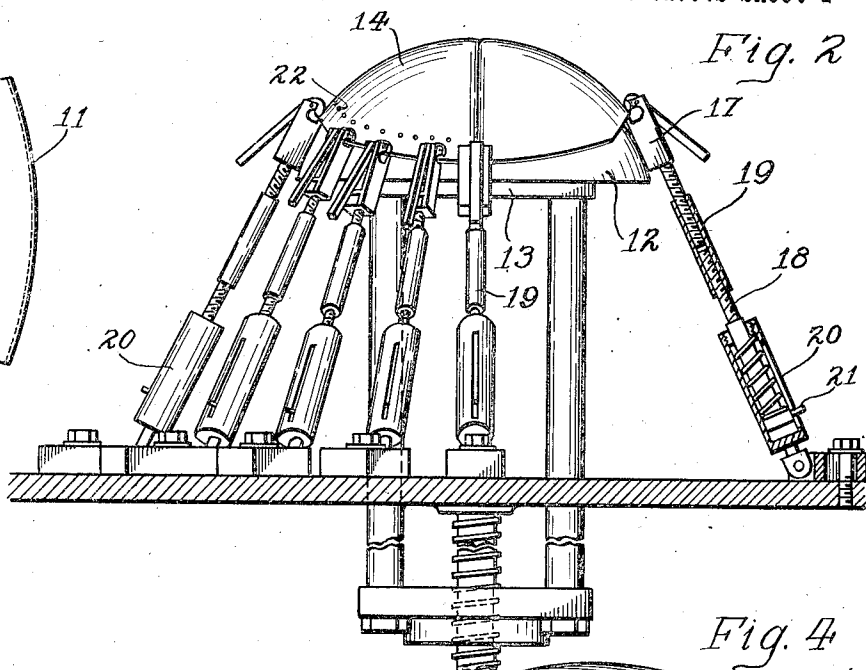


Fig. 4

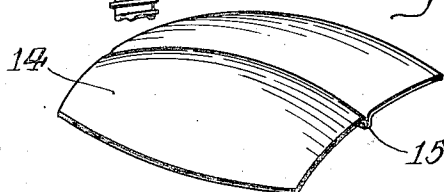


Fig. 3

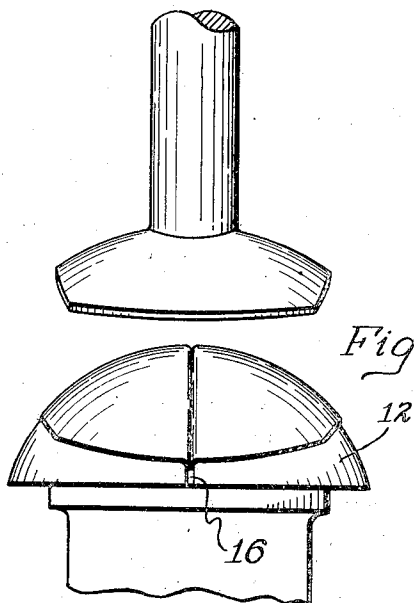


Fig. 5

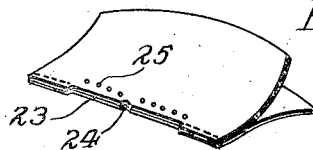
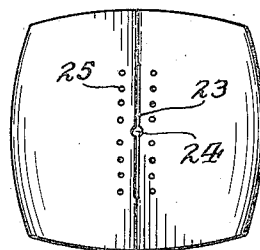


Fig. 6



Witnesses:

Adolph F. Berg

W. A. Moore

Inventor

John T. Riddell

By *Sumner Sumner & Woodward*
Attys.

March 17, 1936.

J. T. RIDDELL

2,034,249

METHOD OF MAKING LEATHER BALLS

Filed Dec. 18, 1933

2 Sheets-Sheet 2

Fig. 7

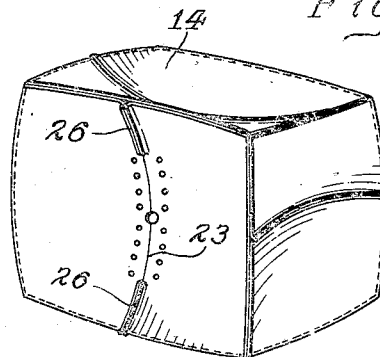


Fig. 8

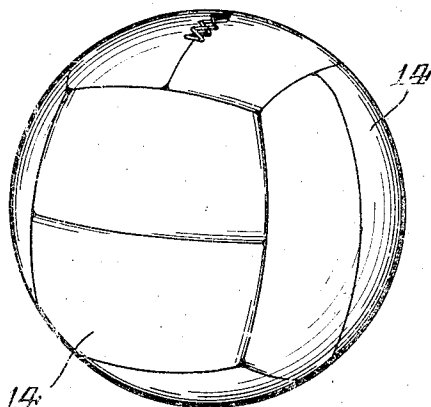
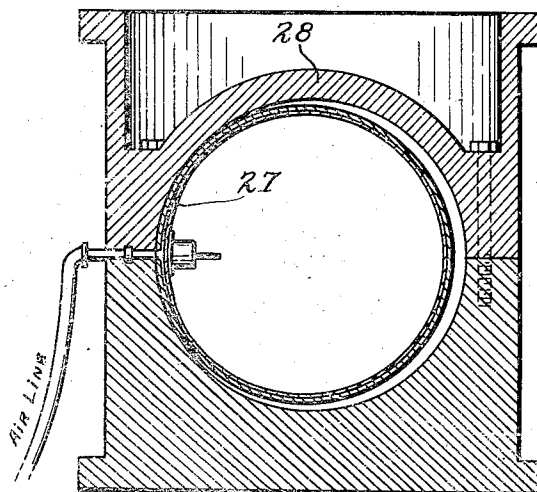


Fig. 9



Witnesses:
Adolph T. Berg

W. A. Snow

Inventor
John T. Riddell

[Signature]
Attys.

UNITED STATES PATENT OFFICE

2,034,249

METHOD OF MAKING LEATHER BALLS

John T. Riddell, Chicago, Ill.

Application December 18, 1933, Serial No. 702,919

1 Claim. (Cl. 69—21)

This invention relates to the manufacture of leather articles and particularly playing balls provided with leather casings that are inflated for use, as for example, basket balls, footballs, soccer balls, volley balls, and the like.

One of the principal ends that is sought in the manufacture of playing balls is to obtain accurate conformity to a predetermined size and shape, and to insure that the balls will retain such size and shape without distortion over a long period of use in play.

The main object of this invention is to provide a method of treating leather and forming it into a ball casing having exact conformity to a predetermined standard shape, and of such uniform texture and condition as to eliminate so far as possible any unintended stretching of the casing and any unevenness in the peripheral contour that might result from age and abuses to which the ball might be subjected in play; and particularly to provide a method of manufacture whereby the leather may be uniformly stretched and permanently set to its final spheroidal form with a minimum of possible inherent structural conditions that might ultimately give rise to deviation from the desired shape for the play for which it is designed.

A specific embodiment of my improved method and certain apparatus for carrying it out are shown in the accompanying drawings in which:—

Figure 1 is a detail showing the shape of the leather blanks out of which the ball is to be made.

Fig. 2 is a fragmentary side elevation of a machine which is employed for stretching and shaping the leather sheets over the form blocks.

Fig. 3 is a side view showing the form block and leather sheet in their relation to a pressure templet that is employed for clamping down the leather sheet and guiding the trimming step of the process.

Fig. 4 is a perspective view of the ball segment after it has been treated by the machine shown in Figure 2 and trimmed to shape with the templet shown in Figure 3.

Fig. 5 illustrates how one panel of each set is folded, slitted and perforated to provide the lacing slit through which the bladder is inserted.

Fig. 6 is a plan view of this panel when unfolded.

Fig. 7 is a perspective view showing a set of six of the panels assembled with their outer or grain sides in, as they appear in hexahedral form after their marginal edges are sewn together.

Fig. 8 is a perspective view of the finished inflated ball.

Fig. 9 is a sectional detail of the mold with the

ball in place ready for the final operation of inflation and stretching of the ball casing within the mold.

In the drawings, I have illustrated the principal steps employed in the manufacture of a spherical ball having its surface subdivided to correspond with the spherical areas that would subtend an imaginary cube having its corners in the surface of the ball, but it will be readily seen that the method of manufacturing, to be hereinafter described, is equally applicable to other shapes of balls and to other arrangements of the surface segments.

In the manufacture of high grade leather balls great care must be taken to select leather of the desired thickness and which is uniform in thickness and texture throughout. In making a ball of the type shown in Figure 8, the leather is cut up into pieces 10 of the four-sided form shown in Figure 1 and of dimensions predetermined by experience. These are first assembled in right and left pairs so that when sewn together on their longer curved edges 11, they will form units roughly approximating the shape as shown in Figure 4 of the ball casing sections.

In the stretching machine illustrated in Figure 2, which is described in greater detail in my co-pending application, Serial No. 702,918, filed of even date herewith and issued as Patent No. 2,005,804, June 25, 1935, a form block 12 conforming approximately to the spherical contour of the ball, but of a size slightly smaller than the finished ball, is mounted upon a crosshead 13.

The unit casing panel 14, consisting preferably of two of the parts 10 sewn together at their corresponding edges 11, is thoroughly soaked in water and laid over the form block 12 with the edges of the seam 15 lying in a groove 16 cut in the surface of the form as appears in Figure 3. The clamps 17 of a series of radiating stretcher members 18 are then attached to the marginal edges of the sheet 14 at substantially equal distances apart and the stretcher members 18 are adjusted by means of the turnbuckles 19 so that each stretcher member will exert equal tension on the sheet of leather. Incorporated in each of the stretcher members 18 is a spring balance 20 by means of which the stretching tension is indicated. The turnbuckles are adjusted until each of the indicators 21 of the spring balances stands opposite the same graduation on its respective scale.

The crosshead 13 is then raised by means of a jack which forms part of the machine fragmentarily illustrated in Figure 2 until a certain

predetermined maximum strain is applied to the leather and if there is any lack of uniformity in the indications of the spring balances, these may be individually adjusted by the turnbuckles to again bring them all to the same indication.

The margins of the leather sheet are then secured to the blocks by means of a series of tacks 22 after which the clamps are released and the block 12 with its attached sheet of leather is set aside to dry and a new block 12 is placed on the crosshead 13 and this part of the operation is repeated.

After these preformed leather panels have become thoroughly dry, the tacks 22 are removed and the blocks, with the leather still in place thereon, are set in a press, the upper member of which is shaped so as to clamp the leather tightly against the surface of the block 12 and the marginal edges of which are shaped to form a template to guide the trimming of the leather to the exact shape shown in Figures 4 and 6 which is the shape of the casing panel of the finished ball with a uniform marginal excess to form the seams between panels.

The next step in the process is to take one of the panels of each set of six and fold it on the middle seam, bringing the grain sides thereof together as in Figure 5. A portion of the seam margin is then trimmed away to form the slit 23, and the valve stem aperture 24; and in the same operation the row of perforations 25 is made for the lacing cords.

The six panels of the set are then tied together at their corners with their grain sides opposed and their marginal edges are sewn together, preferably by machine, to complete the hexahedral assembly shown in Figure 7.

The next step in the operation is to cut the threads of the seams 26 at each end of the slit 23 and invert the parts through this slit so as to bring the grain side out. The seams 26 are then resewn by hand, a bladder 27, Figure 9, is then inserted through the slit 23 and the ball is partly inflated and placed in the mold 28, where under a pressure of approximately 115 pounds it is given a final stretching and brought to its exact spherical or other desired form as determined by the form of the cavity in the mold 28.

After being left in the mold under this pressure for a sufficient time, to permanently establish this form, approximately one hour, its internal pressure is reduced to 13 pounds, the normal playing pressure, and it is ready for the market.

This invention is a development from and an improvement upon the methods of manufacture and apparatus described in my Patents Nos. 1,691,671 and 1,691,672, dated November 13, 1928, and the patent of W. L. Childs No. 1,713,216, dated May 14, 1929. By means of the great uniformity of stretching initially applied and maintained while the leather is wet and drying on a form closely approximating its final conformation, then accurately trimming, accurately sewing and finally expanding and fixing the finished casing in an accurate mold, I am able to obtain under mass production methods of factory operation a maximum degree of excellence and uniformity of product.

While I have particularly described my invention with respect to playing balls, it will be understood that the procedure described may also be applicable to the manufacture of other inflatable products of leather or analogous fibrous material.

The term leather as herein used is intended to include in addition to tanned skins, any analogous sheet material such as artificial leather and certain fabrics that might be substituted therefor.

Although but one specific embodiment of the invention has been herein shown and described, it will be understood that numerous details of the subject matter disclosed may be altered or omitted without departing from the spirit of the invention as defined by the following claim.

I claim:

The method of manufacture of leather balls which consists of wetting a sheet of leather, laying the same on a spheroidal form, applying uniform tensional strains on said sheet at a plurality of points spaced about the margins thereof and in directions radiating substantially from a common center, increasing the said strains uniformly and simultaneously to attain a desired stretch in said sheet of leather, and allowing the leather to dry under such strains.

JOHN T. RIDDELL.