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H. W. HALL

2,362,269

BOWLING BALL OR THE LIKE

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Fig. 1

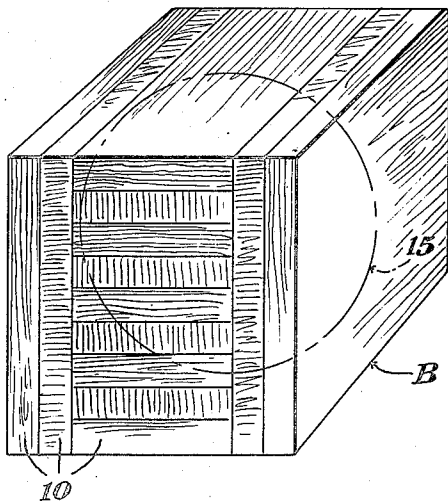


Fig. 2

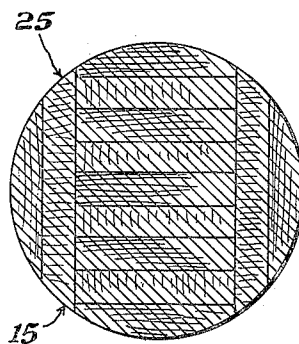


Fig. 3

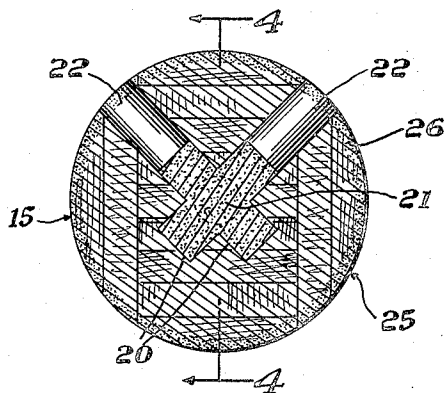


Fig. 4

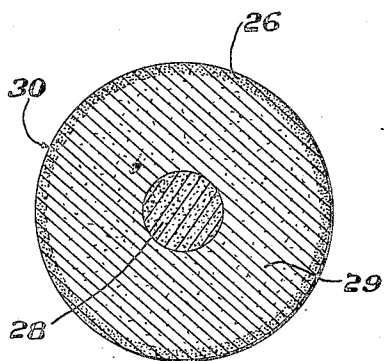
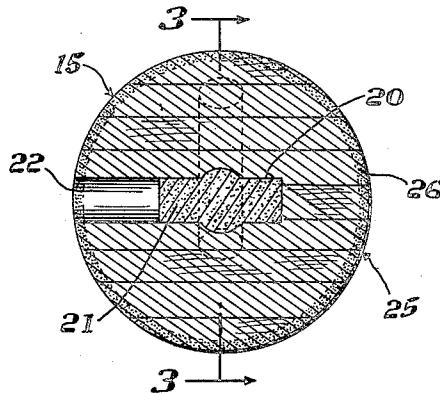


Fig. 5

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BOWLING BALL OR THE LIKE

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4 Claims. (Cl. 273—63)

This invention relates to bowling balls and the like.

One important object of my invention is to construct a bowling ball having an outside surface that is able to withstand the shocks the ball is subjected to in bowling games. An accompanying object is to provide a construction that uses materials which are relatively inexpensive and plentiful, and can be varied sufficiently to attain the desired weight in the ball. A further object is to provide a construction which, in contrast to the relatively hard and heavy outside surface portion, has an adjoining interior portion that is lighter and more cushion-like, thereby providing resilience and tone in the ball.

The foregoing and other objects which will appear as the nature of the invention is better understood, may be accomplished by a construction, combination and arrangement of parts such as is disclosed by the drawing and specification. The nature of the invention is such as to render it susceptible to various changes and modifications, and, therefore, I am not to be limited to said disclosure; but am entitled to all such changes therefrom as fall within the scope of my claims.

In the drawing:

Figure 1 is a perspective view of a laminated block out of which the bowling ball, indicated by dot and dash lines, is formed.

Figure 2 is a cross-sectional view of a ball shaped from the block shown in Figure 1, before it is impregnated with resin.

Figure 3 is a cross-sectional view of a bowling ball taken on the lines 3—3 of Figure 4, to show the holes made and the material within the interior of the ball that adds to its weight.

Figure 4 is a similar view taken on the line 4—4 of Figure 3.

Figure 5 is a cross-sectional view of a bowling ball of modified construction.

As illustrated, I form a rectangular block B by uniting together a plurality of wood laminations 10, which are shown cross-banded in Figure 1 of the drawing. This block B could be made of considerable length to make several balls from it if desired, and could be made from one solid piece instead of laminations. Said laminations could be made of maple, birch, beech or like woods and should be dried before using. The block is then turned to form a round ball 15 slightly larger than the finished ball.

For many balls it is necessary to increase the weight over what the wood laminations normally would weigh, and to accomplish this I drill holes

20 in said ball at approximately right angles to each other. These holes preferably extend beyond the center of the ball, as shown, a predetermined distance, depending upon the additional weight desired in the ball, material used in increasing the weight, and to balance any finger holes so that the ball will roll true, etc. I have shown three such holes 20; but the number could be varied so long as they are so located that the ball will be evenly balanced.

I then pour lead or other filler 21 into said holes, which filler accumulates at the center portion of the ball and preferably extends the same distance in said holes from the center point of said ball to balance weight proportionately. The lead may be heated to its melting point and poured therein if the weight of the ball is to be greatly increased; but for a lighter weight ball sand or other filler may be used, or lead mixed with a lighter filler. Sand has the advantage that the air space between will absorb any excess moisture from the wood. Said holes 20 could first be dusted with potassium salt to help absorb any moisture, and then the lead filler poured in. Said holes are thereafter filled with plugs 22 that ordinarily extend from a point even with the outside surface of the ball inwardly. Said plugs should preferably be of the same material as that in which the holes were drilled, or its equivalent.

In bowling balls that are provided with finger holes, one or two of said holes 20 may be used for that purpose, in which event said plug 22 would not extend from the outside surface.

In place of wood laminations other cellulosic material may be used.

I have now attained the approximate weight, but not the exact weight desired in the finished ball; and it is oversize. The outside surface portion 25 is not sufficiently hard to withstand the shocks normally encountered in bowling. The next step is to impregnate the outer portion of said ball with a plasticizer such as resin solution 26 consisting of phenol formaldehyde and water. Said ball is immersed in said solution for a sufficient length of time for it to penetrate $\frac{1}{4}$ to $\frac{1}{2}$ inch in from the outer surface or any other predetermined depth. This will take approximately two to five hours depending upon the extent of saturation desired and the density of the wood or other cellulosic material the ball is made of. The temperature of the solution need not be higher than 100 degrees F. In place of phenol formaldehyde other plasticizing material or resin may be used such as terpin-hydrate, or urea formaldehyde and the like.

Thereafter the ball 15 is left to dry for a day or two, preferably in an atmosphere of 60 to 70% humidity and at a temperature not to exceed 140 degrees F. so as to prevent prehardening. When the water has evaporated so the cells are filled with the plasticizer it is ready for heating, compressing and hardening.

This is done with phenol formaldehyde at temperatures of 300 to 350 degrees F. and pressure of approximately 250 pounds per square inch.

Pressed between two one-half globular iron shells the plasticized portion of the cellulosic material will be compressed by this pressure so that the ball takes its final size, having previously been made larger to allow for this reduction resulting from compressing the cells of the periphery so that they are solid. The hardened resin and the cell walls are thus plasticized into a homogeneous solid outer portion consisting of hardened resin filled cells and plasticized and hardened wood fibers that are impervious to water and heat and sufficiently hard to stand the pounding they are subject to.

In the modified construction shown in Figure 5 of the drawing a center portion 28 is formed of lead, cement or other material of the desired weight. The main body 29 is made of loose cellulosic material such as sawdust, sugar cane, etc. mixed with a binding agent such as urea resin, and molded to a predetermined size around said

center portion 28. Thereafter the outer surface portion is impregnated with said solution, treated and compressed as previously described.

What I claim:

5 1. A bowling ball or the like comprising a continuous laminated wooden structure forming the interior and exterior thereof, the wood in the outer surface portion of said ball embodying resin and being in compressed condition and harder than the adjoining interior portion thereof.

10 2. A bowling ball or the like comprising a plurality of wood laminations united together and forming the interior and exterior thereof, the outer surface portion of said ball embodying resin and being in compressed condition and harder than the adjoining interior portion thereof, the latter portion not embodying resin.

20 3. A bowling ball or the like comprising a continuous laminated wooden structure forming the interior and exterior thereof, the outer surface portion of said ball embodying a chemical converting agent and being in compressed condition and harder than the adjoining interior portion thereof.

25 4. A bowling ball or the like comprising cellulosic material bonded together and forming the interior and exterior thereof, the outer surface portion of said ball embodying resin and being in compressed condition and harder and denser than the whole interior portion thereof.

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