

No. 699,091.

Patented Apr. 29, 1902.

E. KEMPSHALL.
PLAYING BALL.

(Application filed Mar. 28, 1902.)

(No Model.)

Fig. 1.

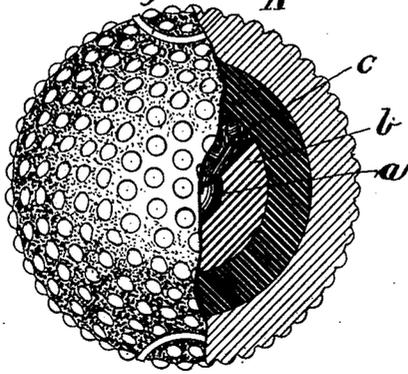


Fig. 3.

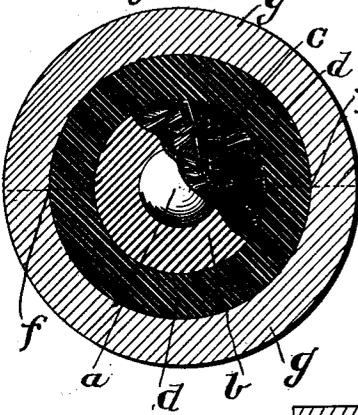


Fig. 2.

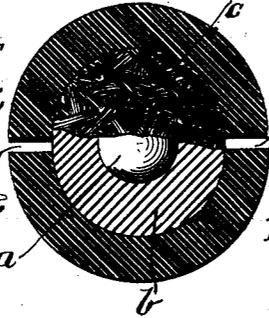


Fig. 4.

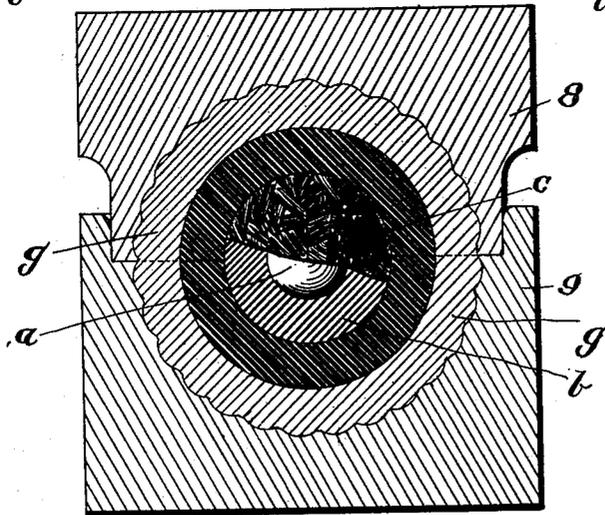
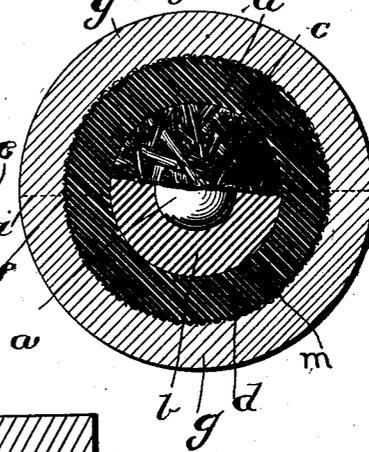


Fig. 5.

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UNITED STATES PATENT OFFICE.

ELEAZER KEMPSHALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE KEMPSHALL MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

PLAYING-BALL.

SPECIFICATION forming part of Letters Patent No. 699,091, dated April 29, 1902.

Application filed March 28, 1902. Serial No. 100,427. (No model.)

To all whom it may concern:

Be it known that I, ELEAZER KEMPSHALL, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Playing-Balls, of which the following is a specification.

This invention relates to playing-balls; and it consists, substantially, in the improvements hereinafter more particularly described.

The invention has reference more especially to golf-balls; but a ball constructed in accordance with and embodying the essential features of my present improvements may be equally as well adapted to the requirements of other games involving the use of balls propelled by impact of a stick, cue, or other implement in the hands of the operator or player.

One of the principal objects of the present invention is to provide a playing-ball of the character specified possessing stability of structure and substantial homogeneity and integrity of the materials constituting the several elements thereof and one also which is highly resistant to fracture and not liable to crack or split under great stress. I so construct the ball that it is highly resilient when struck a hard blow with a club, while not being unduly elastic when given a light blow. These and additional objects are attained by means substantially such as I have illustrated in the accompanying drawings, in which—

Figure 1 is a part sectional view of a playing-ball constructed and organized in accordance with my present invention; and Fig. 2 is a full central section of the core or body and the inner hemispherical elements of the ball, showing the undersized formation of said segments prior to the stretching or distention thereof under pressure in the finishing-dies. Fig. 3 is a full central sectional view of the completed ball. Fig. 4 is a view similar to the preceding figure, representing my improved ball provided with a fabric-lined shell, which renders the same less elastic when given a light blow, while not materially, if at all, impairing its flying qualities when given a hard blow; and Fig. 5 is a sectional view of one means which may be employed in the manufacture of my improved playing-

ball, showing the ball in process of finishing and hardening.

Before proceeding with a more detailed description it may be stated that in carrying my present invention into effect I provide a suitable core or body, to which are applied duplicate hemispherical segments of elastic material, and to these segments are applied in turn other hemispherical segments of resilient or hard and springy material, which latter segments constitute the outer shell of the ball. I preferably employ a hard resilient center or filler for the core or body, and in order to produce a ball which will fly a long distance under a hard blow I preferably construct said core or body of material possessing any required degree of elasticity. As hereinafter specifically explained, I employ a special construction of core or body which is highly elastic and one which may be applied to the center piece or filler in any suitable way. The elastic hemispherical segments hereinbefore mentioned may be applied to the core or body independently of the outer or hemispherical shell-segments, in which case the meeting edges of the one pair of segments will break joint with the meeting edges of the other pair. In some instances, however, it is preferred to apply both the elastic hemispherical segments and the hemispherical shell-segments at one and the same operation, in which case the joints formed by the meeting edges of the two sets of segments may be substantially coincident or in the same plane, this latter construction being the one herein selected as illustrative of my present invention. As thus constructed my improved playing-ball is especially adapted to the "driving" feature of the golf game and also to the "putting" feature of such game to a marked degree. To better adapt the ball to the last-mentioned feature of said game, however, I sometimes construct my improved ball with a lining or lamina of fibrous material, preferably interposed between the inner segments and outer shell, said lining or lamina being applied in any suitable way and consisting, preferably, of textile fabric having open mesh or interstices which become permeated or filled up by portions of the materials of both

the inner and outer hemispherical segments, while the fibers of the fabric become partially embedded in such materials. This construction renders the completed ball less active or lively under a light tap or impulse and which quality is also a desirable one in a billiard and other similar playing-ball. It may be stated that in manufacturing my improved ball the inner or elastic hemispherical segments referred to are constructed, preferably, under size or of dimensions a little short of what would be required to completely inclose the body or core previous to the compression of the structure; but when the ball or structure is subjected to the action of the finishing-dies the material of the said segments is distended or stretched about the body or core in such manner as to force the edges of the segments together to be united under pressure.

Specific reference being had to the several parts of the accompanying drawings by the designating characters thereon, A, Fig. 1, represents my improved playing-ball as a whole or in entirety, said ball in the present instance comprising, preferably, a center piece or filler *a*, of hard material, as gutta-percha or vulcanized india-rubber, and being preferably round or spherical in form. Applied directly to said center piece or filler in any suitable way is the body or core *b* of my improved playing-ball, which body or core may be elastic and which in the finished ball is preferably spherical and constituted of threads *c*, of rubber or other elastic material, which may be wound upon or about the said center piece or filler in various directions, as shown, under high tension. When first applied to the center piece or filler *a*, of gutta-percha, the said body or core may be slightly oblong or of greater diameter in one direction than the other, so as to expand or fill out under pressure of the finishing-dies in the formation of substantially a perfect sphere. Applied to said elastic spherical body or core *b* in any suitable way are duplicate hemispherical segments *d d*, preferably of solid rubber or other analogous material, said hemispheres forming in the finished ball a complete sphere, as shown in Fig. 1. In order to obtain an effective and compact structure, I preferably form said elastic hemispherical segments *d d* undersized in their original form or of dimensions a little short of completely inclosing the body or core *b*, thus leaving an annular space *e* between the adjacent edges of said segments; but when the ball structure is subjected to compression between the finishing-dies 8 and 9 therefor said elastic hemispherical segments are stretched or distended in such manner as to force the said edges into contact, and the said segments may thus become practically welded together at *f* under the pressure and heat of said dies, although the segments may be otherwise caught or united at their edges. Applied to the outer surfaces of the said elastic hemispherical segments are outer hemi-

spherical segments *g g*, of some hard resilient or springy and preferably plastic substance, such as gutta-percha or other analogous material, said outer segments together constituting the outer shell of the ball and the meeting edges of which are similarly joined or welded together at *i i*, Figs. 3 and 4, under the heat and pressure of the dies to the action of which the ball or structure is subjected. I preferably apply both the inner elastic hemispheres and the outer hemispheres to the body or core of the ball at one and the same operation; but it is evident that they may be separately applied by the use of a separate set of dies for the purpose, in which case the joint between the segments of one set may be in a different plane from that occupied by the joint of the other set. In either case, however, it will be understood that the joints are each of such substantial integrality as to render it practically of no special importance which of the structures is adapted in the manufacture of the ball. As illustrative of my present improvements I have herein indicated the joints of the two sets of segments coincident with each other, and in Fig. 2 is shown the original undersized dimensions of the elastic hemispheres, said figure representing the structure prior to the application of the hemispherical segments *g g*, constituting the outer shell.

A playing-ball thus constructed is highly active under heavy blows of a stick or other implement, and in order to render the same less lively under light blows I sometimes prefer to inclose the body or core *b* in an envelop or spherical lamina *m*, of suitable fibrous material, preferably textile fabric having comparatively large mesh or interstices. This envelop or spherical lamina is also applied to the body or core in the form of hemispheres, either independently or as linings for the hemispherical segments of the outer shell, and when the ball is compressed in the dies the edges of said hemispheres are brought together in an obvious manner. During the compression of the ball structure the envelop or laminae of textile material becomes embedded in the materials of the hemispherical segments *d d* and *g g*, and portions of such materials permeate and fill up the mesh or interstices of said envelop or laminae, so that a sort of interlocking is effected, which aids materially in preserving the integrity of the completed ball.

It is of course understood that departures may be made from the construction shown and still be within the scope of my present invention.

The body or core *b*, it will be understood, is very hard, as well as elastic, and the soft-rubber hemispheres are compressed between said core *b* and the hard shell *g*, as well as being tensioned upon said body *b*. Thus I produce a ball having a high degree of efficiency and at less expense than one in which the core consists entirely of tensioned rubber

threads, while it is practically impossible for an implement to cut through to the threads and sever them.

It will be observed that my improved ball comprises a core consisting largely of rubber threads wound under tension and undersized hemispherical segments of elastic material drawn together, and hence tensioned upon said core and caught at their edges, making a permanent entire sphere the diameter whereof is usually less than that of said segments or sections in their original condition. Other hard shells than those illustrated may be used, and, if desired, the hard shell may be omitted when using my improved ball for certain games.

Having described my invention, I claim—

1. A playing-ball comprising a center piece, rubber wound continuously in different directions thereon to form a materially larger sphere, and a thick solid soft-rubber envelop tensioned upon said sphere.

2. A playing-ball comprising rubber wound continuously in different directions under tension to form a sphere, and a solid soft-rubber envelop upon said sphere, said envelop consisting of undersized spherical segments drawn over said sphere and caught at their edges.

3. A playing-ball comprising a center piece and a plurality of soft-rubber spheres thereon, one of said spheres inclosing the other, and one of said spheres consisting of solid soft rubber under tension, and the other consisting of rubber wound in different directions under high tension and continuously.

4. A playing-ball comprising a sphere of tensioned rubber threads and undersized segments of soft rubber drawn together upon said sphere and cemented together at their edges.

5. A playing-ball comprising a core, rubber threads wound thereon under tension, and undersized segments of soft rubber drawn together upon said sphere and cemented thereto, and also cemented together at their edges.

6. A playing-ball comprising rubber wound continuously in different directions under tension and forming a sphere, a thick solid soft-rubber envelop upon said sphere, and a shell of harder material upon said envelop.

7. A playing-ball comprising a center piece, rubber wound continuously in different directions thereon and forming a materially larger sphere, a thick solid soft-rubber envelop tensioned upon said sphere, and a shell of hard, plastic material upon said envelop.

8. A playing-ball comprising rubber wound continuously in different directions and under tension and forming a sphere, a solid soft-rubber envelop upon said sphere, said envelop consisting of undersized spherical segments

drawn over said sphere and caught at their edges, and a shell of gutta-percha upon said segments.

9. A playing-ball comprising a center piece and a plurality of soft-rubber spheres thereon, one of said spheres inclosing the other, and one of said spheres consisting of solid soft rubber under tension, and the other consisting of rubber wound in different directions continuously and under high tension, and a shell of hard material holding said rubber spheres under compression.

10. A playing-ball comprising a sphere of tensioned rubber threads, undersized segments of soft rubber drawn together upon said sphere and cemented together at their edges, and a shell of plastic material holding said segments under compression.

11. A playing-ball comprising a core, rubber threads wound thereon and under tension, undersized segments of soft rubber drawn together upon said sphere and cemented thereto and also cemented together at their edges, and a shell consisting of welded segments of gutta-percha and holding said soft-rubber segments under compression.

12. A playing-ball consisting of rubber wound continuously in different directions under tension and forming a sphere, a thick solid soft-rubber envelop upon said sphere, and a fabric-lined shell of plastic material upon said envelop.

13. A playing-ball comprising a springy center piece, rubber wound continuously in different directions thereon and under tension, a thick solid soft-rubber envelop tensioned upon said rubber windings, and a shell of fabric-lined plastic material holding said envelop under compression.

14. A playing-ball comprising a plurality of soft-rubber spheres, one sphere inclosing the other, and one of said spheres consisting of solid soft rubber under tension, and the other consisting of rubber wound continuously in different directions and under high tension, and a shell consisting of plastic material and fabric and holding said rubber spheres under compression.

15. A playing-ball comprising a center piece, rubber threads wound continuously in different directions thereon and under tension, undersized segments of soft rubber drawn together upon said sphere and cemented thereto and also cemented together at their edges, and a fabric-lined gutta-percha shell holding said soft-rubber segments under compression.

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