No. 701,741. Patented June 3, 1902.

E. KEMPSHALL.

GOLF BALL.

(Application filed May 5, 1902.)

(No Model.)

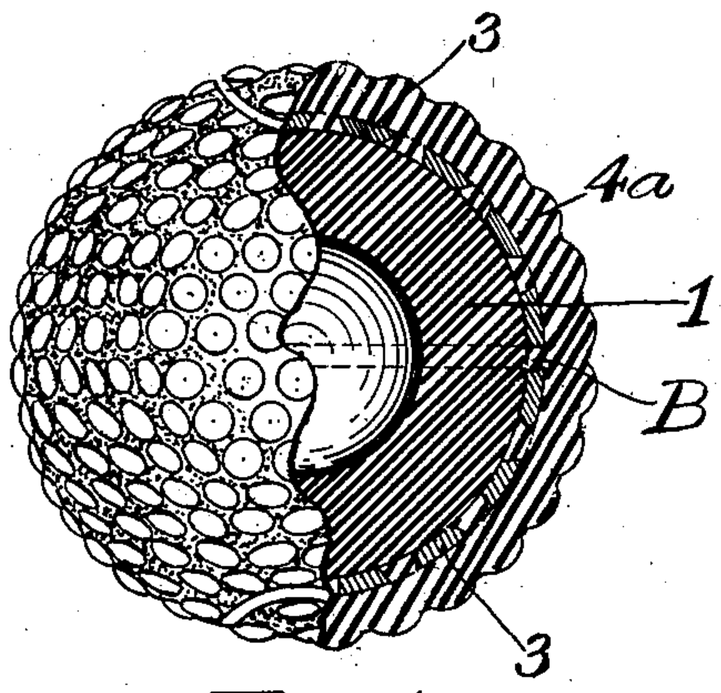

Fig. 1.

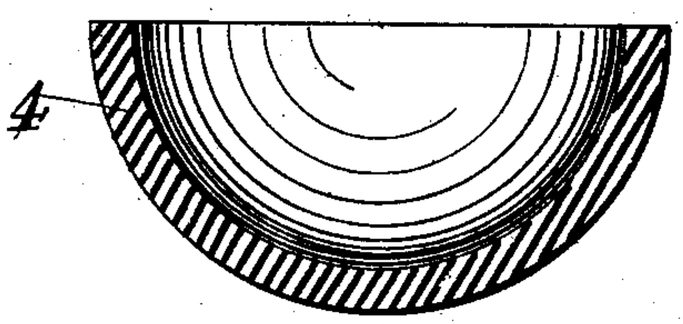

Fig. 4.

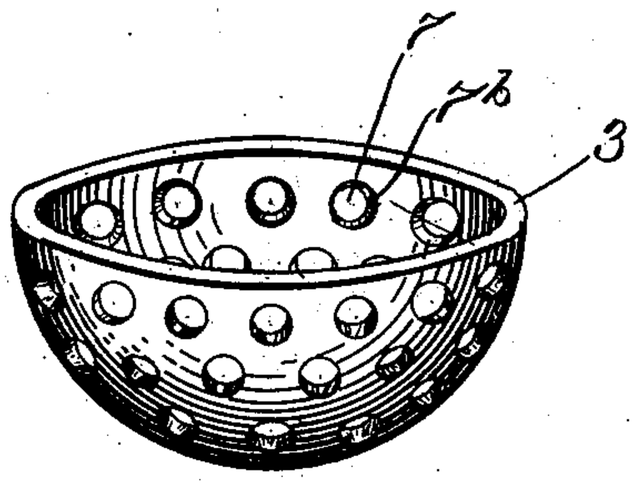

Fig. 2.

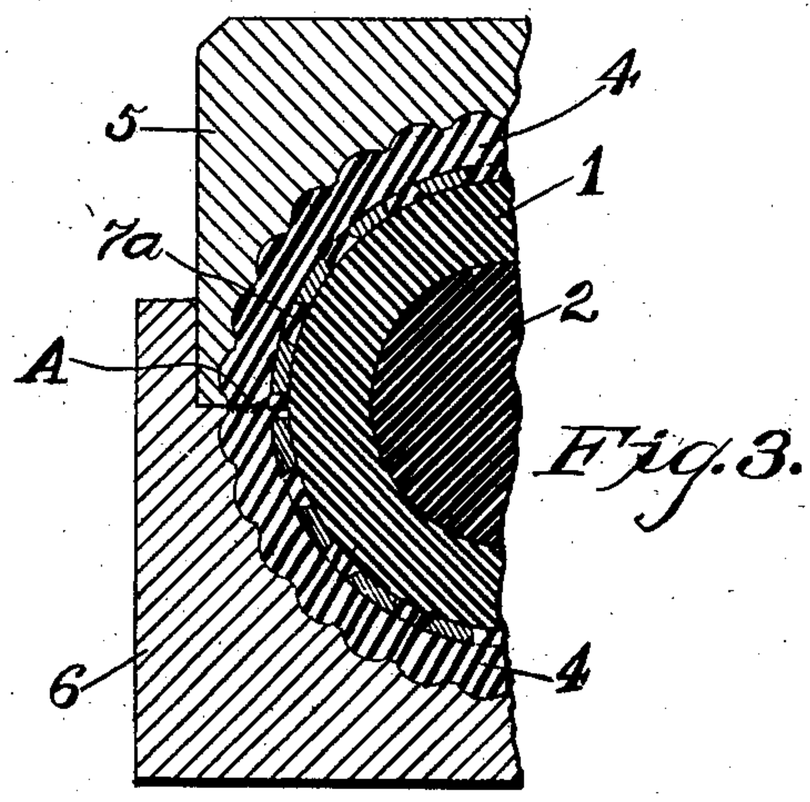

Fig. 3.

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GOLF-BALL.

SPECIFICATION forming part of Letters Patent No. 701,741, dated June 3, 1902.

Application filed May 5, 1902. Serial No. 105,887. (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 Golf-Balls, of which the following is a specification.

This invention relates to playing-balls, and especially to those intended to withstand harsh usage, as in the game of golf; and its object is to provide a shell which is resilient and has little liability to be cut or broken and otherwise to improve the ball.

In the drawings forming part of this specification, Figure 1 is a view, partly in section, of a ball made according to my present improvements and having a central cavity. Fig. 2 shows a hemispherical perforated blank of hard springy material used as a reinforcement in the shell of the ball. Fig. 3 illustrates the final stage in making the ball, which is shown as having a hard center piece; and Fig. 4 shows in section one of a pair of hemispherical blanks of plastic material used in forming the outer component of the ball-shell.

In the several views similar parts are designated by similar characters of reference.

In the preferred manner of practicing my invention I inclose a rubber sphere 1, which may be provided with a center piece 2 of gutta-percha or other springy material, in a shell compounded of layers of gutta-percha and celluloid, preferably one layer of each, and the layers being preferably interlocked. For the inner layer I prefer to use hemispherical segments 3 of celluloid, fitting upon the rubber sphere 1. To this layer I apply hemispherical segments 4 of gutta-percha, and the parts thus assembled I place in heating-dies 5 and 6, by which the gutta-percha segments are softened and compacted and also welded, as at A. Portions of the gutta-percha are forced into perforations 7 provided in the celluloid segments, forming hobs, as indicated at 7^a, whereby the shell components are locked together. I prefer to countersink the perforations from the inside of the segments, as at 7^b, so that the hobs 7^a are of dovetail form, as illustrated, thereby effecting a more secure lock. It is not essential, however, in all ways of forming an interlocked shell that the shell components 3 and 4 be locked together after being assembled upon a filling.

By preference I make the celluloid segments 3 undersized, so that when they are placed upon the ball there is a gap or crevice between them which is coincident with the weld-line A of the gutta-percha segments, whereby the gutta-percha at the weld-line is forced into said crevice, as at B, so that an increased area of welding surface or material is given, or, in other words, the weld-joint is broadened or extended inwardly between the slightly-separated edges of the segments 3.

By means of the segments 3, which taken together form a substantially complete inner shell or shell component and which are preferably of thin celluloid, the gutta-percha shell or shell component 4^a is powerfully reinforced. If desired, the gutta-percha may be thinner than usual, thus avoiding an objection to which a thick shell of this material is sometimes liable because of its liability under some conditions to acquire a permanent dent or become cracked when given a severe blow by a club. Because of the celluloid or hard layer sharp indentation of the gutta-percha shell is prevented and the force of the blow is diffused over a wide area of the rubber sphere, thus not only saving the gutta-percha from injury, but also quickening the response of the ball to a blow.

It will be seen that the gutta-percha is supported substantially throughout upon a resilient and firm layer, which is preferably so joined to the gutta-percha that the two layers operate practically as one, thus vastly improving the playing quality of the ball. In other words, the gutta-percha is supported upon a reinforcing springy shell consisting of the hemispheres 3 3, whereby injury to the gutta-percha shell is minimized or avoided, while said shell or layer 3 3 in action coöperates with the gutta-percha layer to great advantage. It will also be seen that the compound shell by reason of being mounted upon a yielding sphere or filling, which may consist of firm and highly-elastic rubber, is by said filling further supported and reinforced throughout, thereby producing a nearly indestructible ball, while at the same time there is in action a satisfactory coöperation between the said rubber sphere and the inner layer 3 3

of the shell, thereby improving the springy quality of the ball.

By the perforations 7 not only are the shell components interlocked, but the flexibility of the inner shell is improved, and so far as certain features of my invention are concerned it is not essential that this inner shell consist of celluloid, since other hard material may be employed. It is not, however, essential in all ways of practicing my invention that the shell components be interlocked, and, if desired, the interlocking may be otherwise effected.

Since the improvements effected in the ball by means of my present invention arise largely from the construction and application of the shell, it will be understood that a variety of yielding fillings may be employed—as, for instance, the rubber sphere may be either solid or hollow, as at Fig. 1, or filled with gutta-percha, as at 2, Fig. 3, the latter structure being preferred.

It will be seen that one of the important features of my present improvements consist in supporting an outer shell-layer of plastic material by means of an inner thin shell-layer of harder and more resisting plastic material, and so far as this feature is concerned each layer may consist of a simple unperforated shell. Preferably the shell consists wholly of two layers, as illustrated. It will be understood that the filling, comprising the sphere 1 and the center piece 2, is held under compression by the compound shell, said compression being effected by the heating-dies, the compression of the ball effected thereby being maintained while the shell cools and hardens. By the pressure of the dies the inner layer 3 3 is embedded in the outer layer 4^a, which is softened by reason of the heat of the dies.

Having described my invention, I claim—

1. A playing-ball comprising a shell having two layers of plastic material; the inner layer being harder than and distinct from the outer layer, said outer layer forming the cover of the ball.

2. A playing-ball comprising a yielding filling and a shell consisting wholly of two layers; the inner layer consisting of celluloid and the outer layer consisting of a more yielding plastic material.

3. A playing-ball comprising a shell consisting wholly of two layers, the outer layer consisting of plastic material and being materially thicker and more yielding than the inner layer, said outer layer forming the cover of the ball.

4. A playing-ball comprising a rubber sphere and a shell, the latter consisting wholly of two springy layers, and the outer layer being materially thicker than the inner layer and also consisting of more yielding material.

5. A playing-ball comprising a shell having an inner layer of celluloid and an outer layer of gutta-percha, and a yielding filling.

6. A playing-ball comprising a shell having two layers of plastic material, the inner layer being harder and distinct from the outer layer, and a yielding filling held under compression by said shell.

7. A playing-ball comprising a shell having an inner hard layer, an outer layer of gutta-percha, said outer layer being materially thicker than said inner layer; and a rubber sphere held under compression by said shell.

8. A playing-ball comprising a shell having an inner layer of celluloid and an outer layer of gutta-percha, said outer layer being materially thicker than said inner layer; and a springy filling held under compression by said shell.

9. A playing-ball comprising a shell consisting of an outer layer of molded springy material, and an inner supporting layer of harder springy material; said layers being interlocked.

10. A playing-ball comprising a shell consisting wholly of two layers, the inner layer being perforated, and the material of the outer layer penetrating the perforations; said inner layer being materially thinner than said outer layer.

11. A playing-ball comprising a shell consisting of two layers of plastic material; the inner layer being perforated and the material of the outer layer penetrating the perforations, said outer layer being materially thicker and of more yielding material than said inner layer.

12. A playing-ball comprising a shell and a yielding filling; said shell consisting of two layers, one layer being perforated and the material of the other layer penetrating the perforations; and the outer layer being materially thicker than the inner layer and also of softer material.

13. A playing-ball comprising a shell having interlocked layers, the inner layer being of harder material than the outer layer, and a yielding filling held under compression by said shell.

14. A playing-ball comprising a shell consisting of a perforated inner layer of celluloid, an outer layer of gutta-percha, the material of said outer layer penetrating said perforations; and a yielding filling held under compression by said shell.

15. A playing-ball comprising a shell consisting of an inner layer of celluloid and an outer layer of gutta-percha; said layers being interlocked; and a yielding filling held under compression by said shell.

16. A playing-ball comprising a shell consisting wholly of two layers, the inner layer being perforated and the material of the outer layer penetrating the perforations; said outer layer being materially thicker than said inner layer and also of softer material; and a yielding filling held under compression by said shell.

17. A playing-ball comprising a shell having two layers of plastic material; the inner layer being perforated and also being harder

than and distinct from the outer layer, and the latter consisting of welded segments; and a springy core.

18. A playing-ball comprising a yielding filling and a shell consisting wholly of two layers; the inner layer consisting of separated segments and the outer layer consisting of welded segments of plastic material; the weld portion of the outer layer protruding between the edges of said separated segments.

19. A playing-ball comprising a shell consisting wholly of two layers, the inner layer consisting of celluloid and the outer layer consisting of welded segments of gutta-percha and being materially thicker than the inner layer; and a yielding filling held under compression by said shell.

20. A playing-ball comprising a shell having an inner layer consisting of segments of celluloid and an outer layer consisting of welded segments of gutta-percha, and a yielding filling within said shell and forming the body of the ball.

21. A playing-ball comprising a shell having two layers of plastic material, the inner layer being harder and distinct from the outer layer and also being perforated, and a yielding filling held under compression by said shell.

22. A playing-ball comprising a shell having an inner hard layer, an outer layer consisting of welded segments of gutta-percha, said outer layer being materially thicker than said inner layer; and a rubber sphere held under compression by said shell.

23. A playing-ball comprising a shell having an inner perforated layer of celluloid and an outer layer of gutta-percha, said outer layer being materially thicker than said inner layer; and a springy filling held under compression by said shell.

24. A playing-ball comprising a shell having an outer layer consisting of welded segments of gutta-percha, and an inner thinner layer of harder springy material; said layers being interlocked, said outer layer forming the cover of the ball.

25. A playing-ball comprising a shell consisting wholly of two layers, the inner layer consisting of separated segments each of which is perforated, and the material of the outer layer penetrating the perforations; said outer layer consisting of welded segments, the welded portion of the outer layer extending between said separated segments, said outer layer forming the cover of the ball.

26. A playing-ball comprising a shell consisting of two layers, the inner layer being perforated and consisting of separated segments of celluloid, and the material of the outer layer penetrating the perforations, said outer layer consisting of welded segments of gutta-percha and being materially thicker than said inner layer; the welded portion of the gutta-percha layer extending between the celluloid segments, said outer layer forming the cover of the ball.

27. A playing-ball comprising a shell consisting of two layers, one layer being provided with perforations each whereof extends through said layer, the perforations being countersunk, and the material of the other layer penetrating the perforations.

28. A playing-ball comprising a shell having interlocked layers, the inner layer being of celluloid and perforated, and the outer layer consisting of welded segments of gutta-percha, and a yielding filling held under compression by said shell.

29. A playing-ball comprising a shell consisting of a perforated inner layer consisting of separated segments of celluloid, an outer layer consisting of welded segments of gutta-percha, the material of said outer layer penetrating said perforations; and a yielding filling held under compression by said shell.

30. A playing-ball comprising a shell consisting of an inner layer of celluloid and an outer layer consisting of welded segments of gutta-percha; said layers being interlocked; and a rubber sphere held under compression by said shell.

31. A playing-ball comprising a shell consisting wholly of two layers, the inner layer being perforated and the material of the outer layer penetrating the perforations; said outer layer being materially thicker than said inner layer and also of softer material; and a rubber shell held under compression by said shell and provided with a hard, springy center piece.

32. A playing-ball comprising a filling and a shell thereon consisting of welded segments of plastic material having embedded therein separated and distinct perforated segments of other plastic material.

33. A playing-ball comprising a filling and a shell thereon consisting of welded segments of plastic material having embedded on its inner side separated and distinct perforated segments of other plastic material.

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