

No. 696,367.

Patented Mar. 25, 1902.

E. KEMPSHALL.
GOLF BALL.

(Application filed Jan. 2, 1902.)

(No Model.)

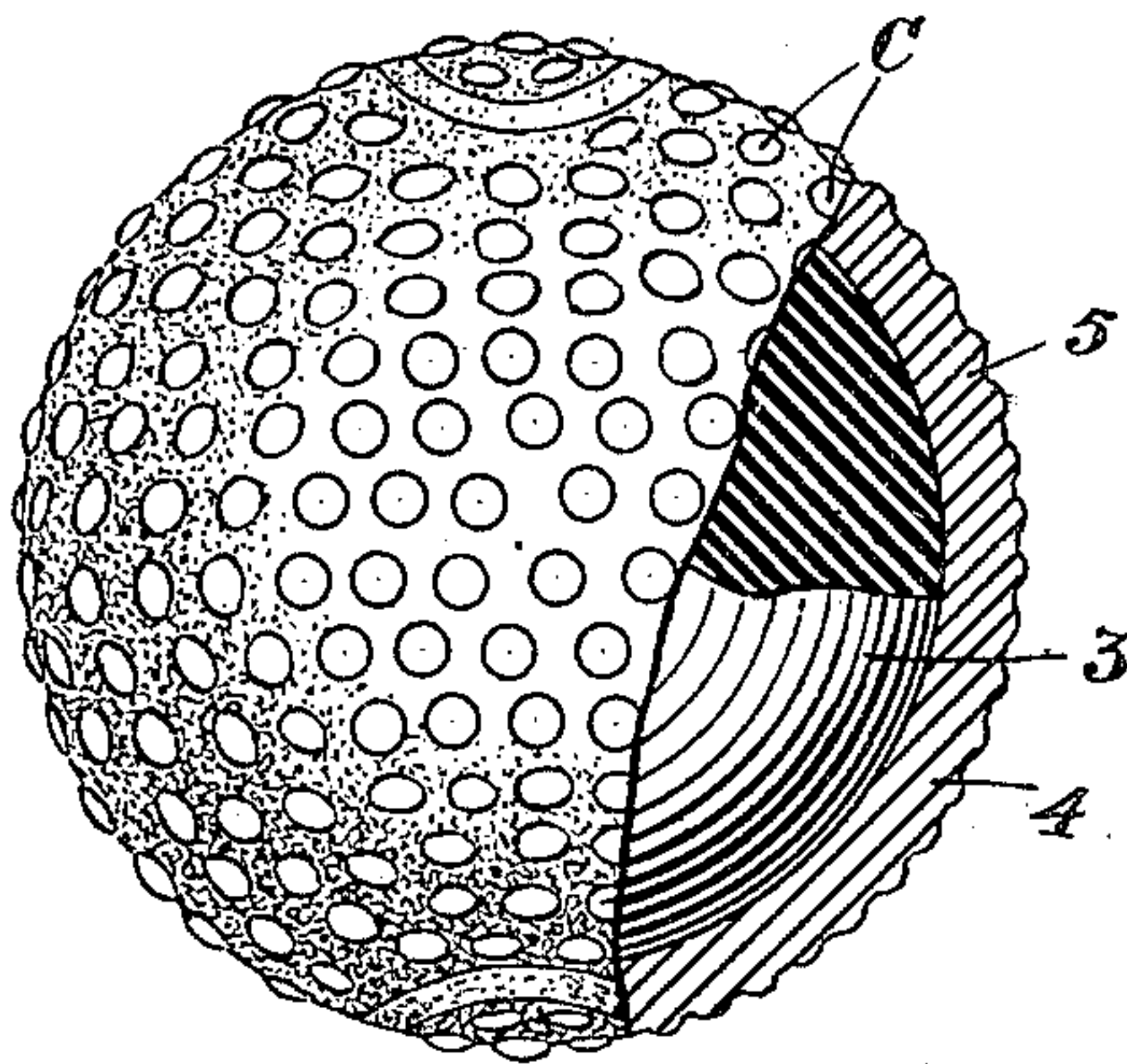


Fig. 1.

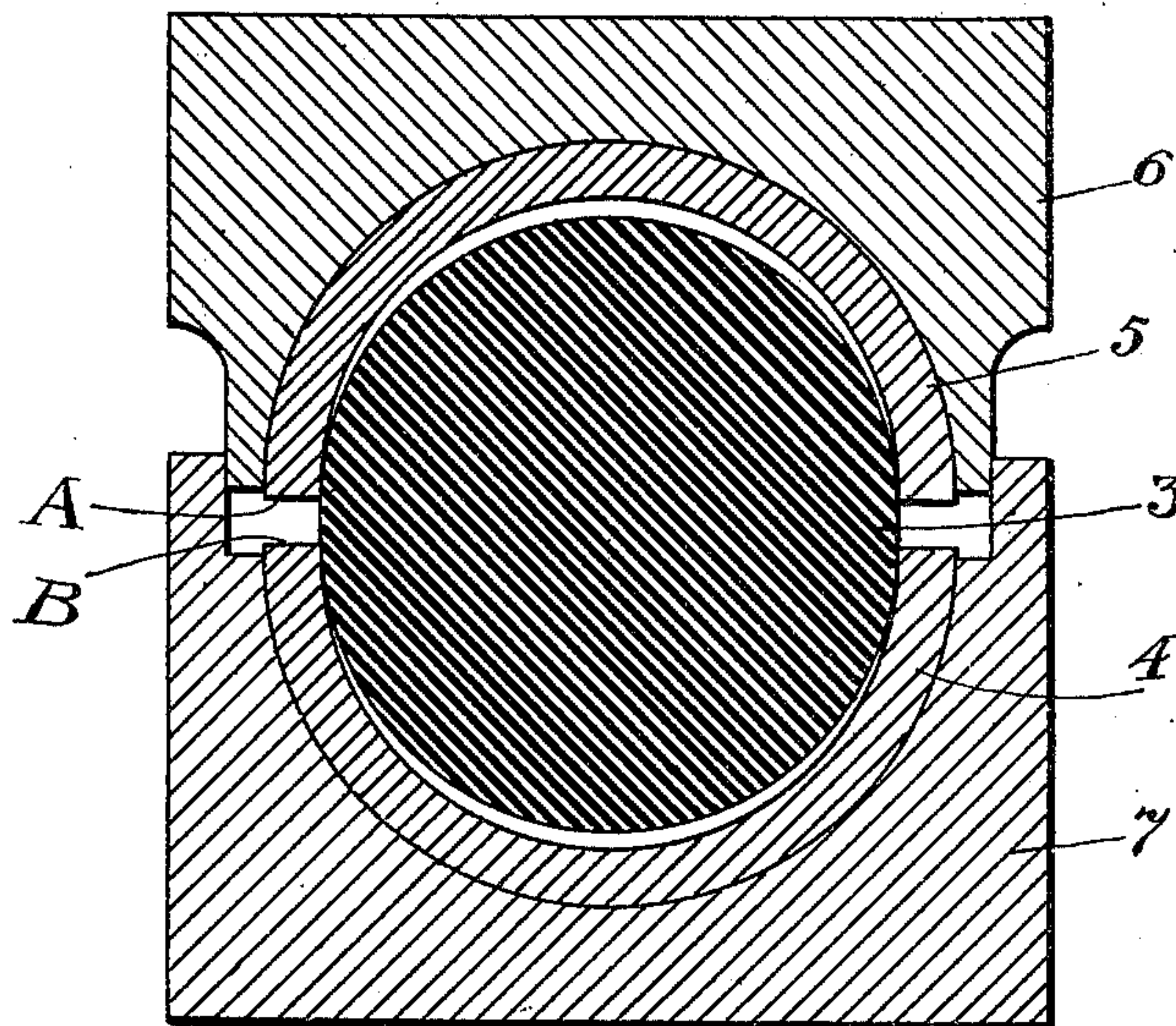


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

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

GOLF-BALL.

SPECIFICATION forming part of Letters Patent No. 696,367, dated March 25, 1902.

Original application filed September 27, 1901, Serial No. 76,814. Divided and this application filed January 2, 1902. Serial No. 88,065. (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, such as used in golf and other games; and its object is to improve the quality, efficiency, and durability of the ball.

This application is a division of my pending application, Serial No. 76,814, filed September 27, 1901.

The ball forming the subject-matter of this application is constructed with a relatively hard springy shell, preferably celluloid, which is filled or at least backed with a mass of solid india-rubber held under compression by the shell, so that the expansive tendency of the filling aids in preserving indefinitely the spherical form of the shell, as well as in supporting the latter against distortion under a blow.

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 Fig. 2 illustrates the preferred method or process of manufacturing the same.

Similar characters of reference designate like parts in the figures.

I produce a center piece (designated by 3) of the required size and shape of highly-vulcanized soft india-rubber. So long as the shell is backed by a thick mass of this material it is not essential in all cases that the rubber form a solid sphere. The shell I preferably form in hemispherical segments, (designated as 4 and 5, Fig. 2.) The filling 3 is placed between said segments, and the whole is placed between forming and heating dies, as 6 and 7, whereupon the latter are brought together by means of suitable mechanism forcing the edges of the shells into intimate contact. By heating the dies the celluloid is rendered plastic, thus facilitating the welding thereof and the completion of the shell. The abutting edges of the original segments at A and B are made somewhat full, thereby

to furnish material for properly forming the joint between them. The material of the shell is compressed and solidified between the dies and the resisting mass 3, thus toughening and increasing the durability of the shell, especially when the same is made of celluloid. The central mass 3 is first prepared somewhat oversize and furnishes a substantial support, so that the comparatively thin shell is prevented from collapsing under the pressure of the dies. By properly sizing the center piece the shell may be sustained against any necessary degree of die-pressure. The thickness of the shell and also the firmness and relative size of the center piece may be varied in accordance with the requirements of any particular game or use for which the ball may be intended. The ball is retained by the dies until the shell cools and hardens, so that it may retain its shape and permanently hold the core under compression.

It is to be understood that in case condensation of the bulk of the core takes place in the operation of compressing the shell upon the core it is due to the presence of air-spaces or impurities in the material. It is not essential in practicing my invention that the core be always condensed in bulk, so long as when the ball is finished the core is powerfully gripped by the shell, thereby enabling the shell and core to act conjointly, and hence vastly improving the playing qualities of the ball.

By causing the elastic rubber core to be permanently compressed by the shell the flying power of the ball is increased, since owing to its expansive tendency the core resists distortion of the shell, and since also owing to its being in a state of compression less distortion of the ball is required in order to reach the limit of compression when struck by an implement. Little power is therefore wasted in changing and restoring the shape of the ball, and the latter resumes its original form quickly and springs from the implement at high speed.

The solid core is inexpensive and may consist of somewhat heavy india-rubber so highly

vulcanized that it may withstand the heating effect of the dies, the intention being to render the shell plastic by heat without injuring the rubber.

5 By making the shell of celluloid, which is stiff and springy, and the interior mass wholly or largely of rubber under compression I produce a twofold springiness of the ball, or, in other words, enable the elasticity of the filling
10 to coöperate with the springiness of the shell to instantly restore the ball to its normal shape after distortion by a blow.

It will be seen that my ball comprises the advantages of a solid celluloid sphere without
15 the disadvantages thereof. It is hard and wear-resisting. It has a smooth surface. It cannot lose its color. It is waterproof. Neither dew nor moisture sticks to it, enabling it to travel freely through grass. It may
20 when necessary be scoured or burnished off, and at the same time, owing to its thinness, it has a springy quality not present in a ball of solid or practically solid celluloid. Moreover, by backing a thin shell with a mass of
25 rubber it is less liable to suffer from chipping than would be the case with celluloid in a mass. The center remains always concentric with the shell, which is an important feature, since it enables the ball to travel true through the
30 air and upon the ground, thus avoiding an objection to balls whose cores get out of center that they travel in an irregular fashion. Moreover, by employing a smooth rubber sphere within the shell I am enabled to make the shell
35 of uniform thickness throughout, thus improving the quality of the ball by causing it to respond always in the same way to the same blow. Owing to the rigidity of the shell as compared with the elastic filling a further ad-
40 vantage is obtained, since under a light blow the stiff shell does not yield nor spring and is therefore "dead" for short plays, while under a heavier blow the shell is flexed and acts upon the filling, thus bringing into play the

elasticity of both shell and filling and enabling 45 the ball to carry a great distance.

I usually make the surface of golf-balls corrugated or pebbled, as illustrated at C, Fig. 1; but for other uses the surface may be otherwise finished. 50

Variations in proportions and otherwise may be made within the scope of my invention.

Having described my invention, I claim—

1. A playing-ball comprising a stiff, springy, 55 highly-compacted shell formed from plastic material, and a soft rubber sphere or core powerfully gripped by and tending constantly to expand said shell.

2. A playing-ball comprising a highly-com- 60 pacted celluloid shell and a core or filling consisting largely or wholly of highly-vulcanized soft india-rubber held under permanent compression by said shell.

3. A playing-ball comprising a relatively 65 thin celluloid shell compressed upon a sphere of solid india-rubber, so that the latter may form a yielding backing for the shell and hence prevent fracture of the latter from a blow. 70

4. A ball comprising hemispherical shell-segments formed from plastic material and highly compressed and welded together upon a sphere or ball of soft rubber.

5. A ball comprising highly-compacted 75 spherical shell-segments welded together at their edges upon a sphere of highly-vulcanized soft rubber.

6. A playing-ball comprising hemispherical segments of highly-compacted celluloid weld- 80 ed together upon a sphere of highly-vulcanized soft rubber, and powerfully gripping the latter.

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Witnesses:

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