

No. 696,365.

E. KEMPSHALL.
GOLF BALL.

Patented Mar. 25, 1902.

(Application filed Oct. 24, 1901.)

(No Model.)

Fig. 1.

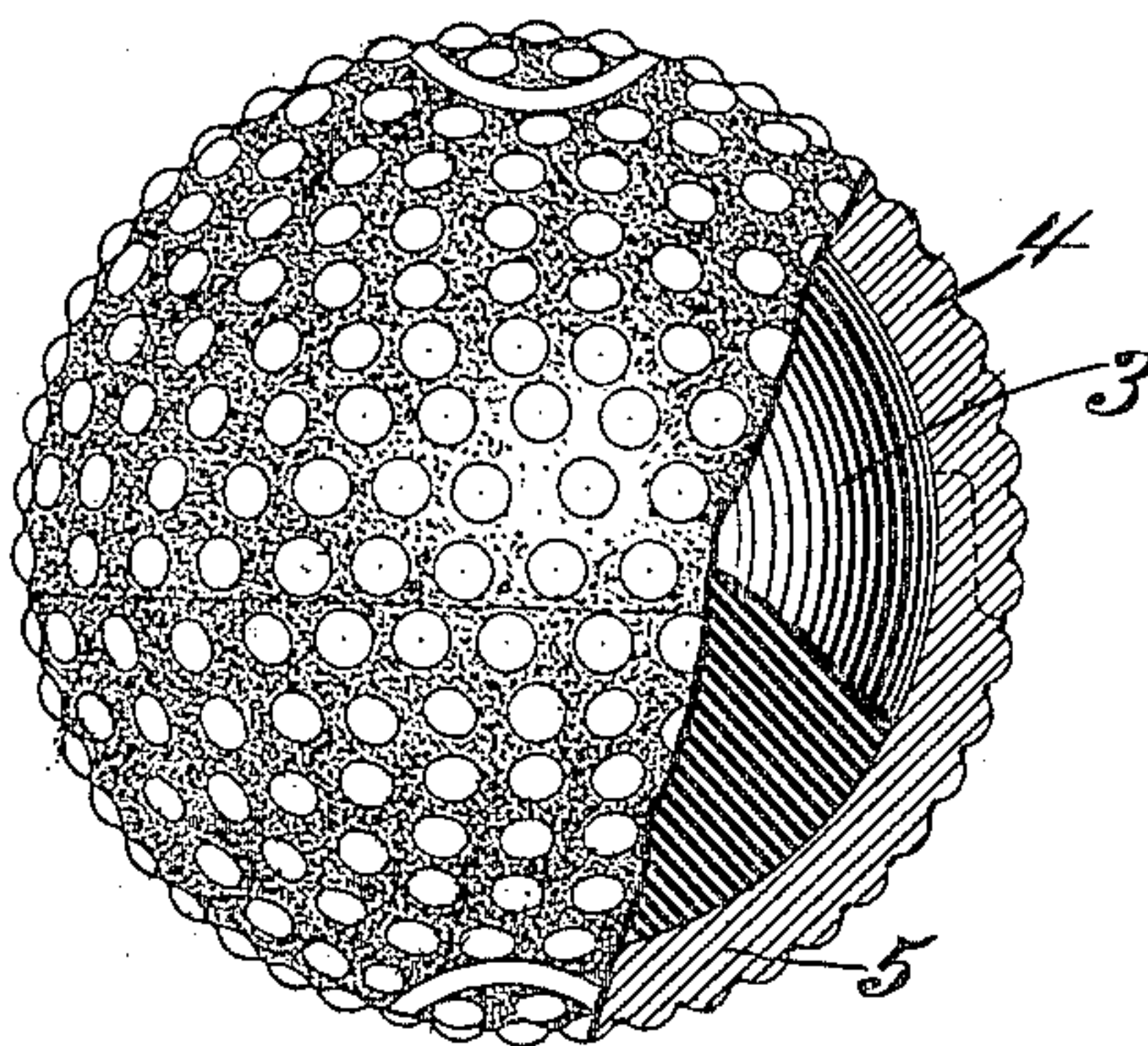
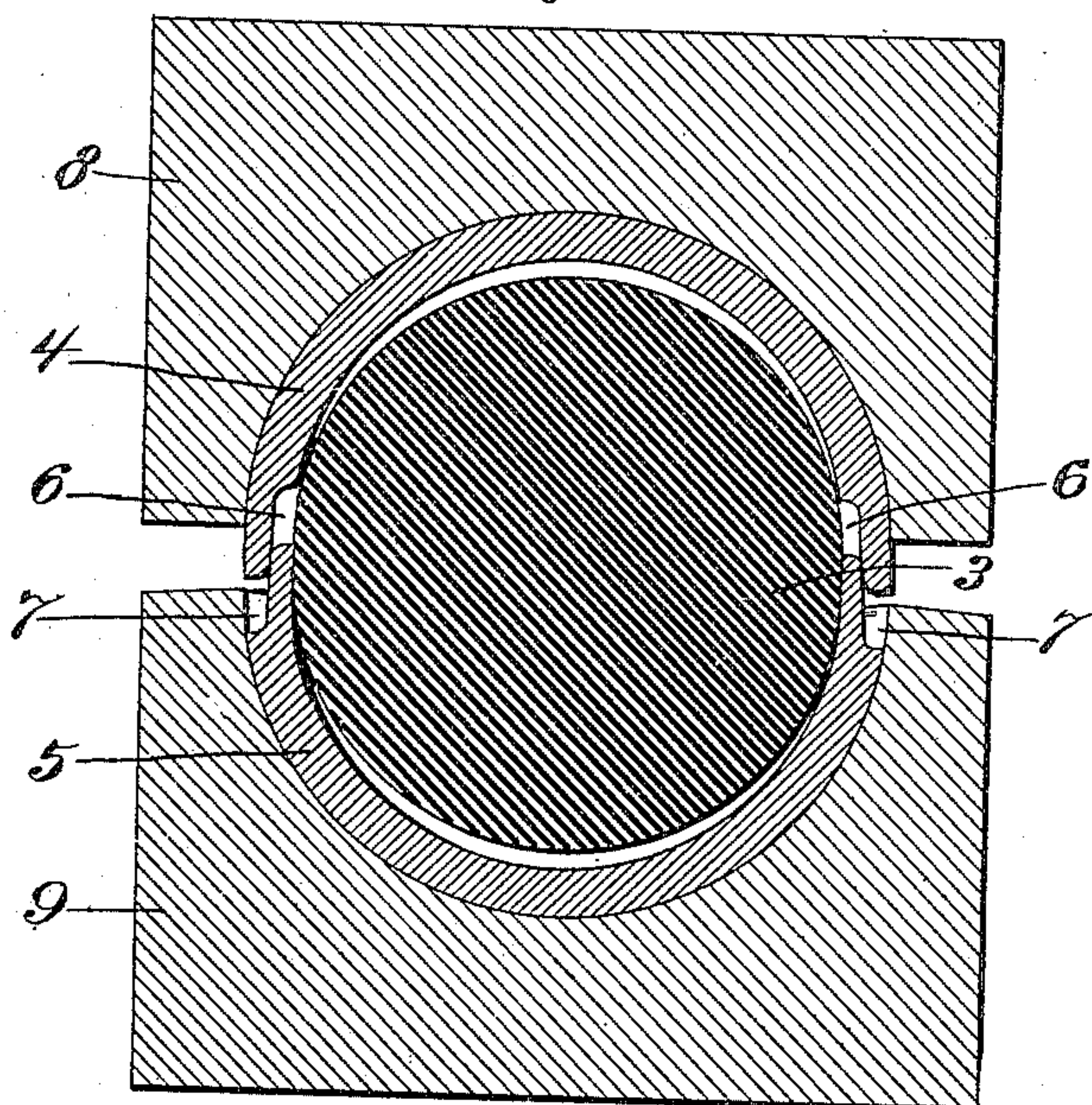


Fig. 2.



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. 696,365, dated March 25, 1902.

Application filed October 24, 1901. Serial No. 79,774. (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 balls such as used in golf and certain other games.

10 In my pending application, filed September 27, 1901, Serial No. 76,814, is illustrated a ball constructed with a relatively hard or stiff but springy shell, which is filled with an elastic substance that is held under compression 15 by the shell, whereby the latter is supported against distortion produced by a blow, the constant elastic outward pressure of the core tending to maintain the shell in spherical shape and coöperating with the natural springiness of the shell to enhance the efficiency of 20 the ball. The material of the core is preferably gutta-percha and that of the shell preferably celluloid, and in manufacturing such balls I preferably make the core oversize, 25 compress the shell-segments thereover, and cause the latter to adhere to each other, all as set forth in said application. According to my present improvements the sections of the shell are lap-jointed instead of butting, 30 as in said application, thus enabling one section to close over the opposing section before pressure is exerted upon the inner body or core of the ball, thereby counteracting the tendency of the core to squeeze out between 35 the edges of the shell-sections when the pressure is applied. Moreover, the shell-sections present larger meeting surfaces to each other and a strong joint is made.

Referring to the accompanying drawings, 40 Figure 1 is a view, partly in section, of a ball made according to my present improvements; and Fig. 2 illustrates the preferred method of manufacturing the balls.

Similar characters of reference designate 45 like parts in the figures.

The shell of the ball consists of a relatively hard but springy material, such as celluloid, while the center or filling consists of a relatively soft substance elastic in all directions. 50 For the filling I employ any suitable mate-

rial, such as rubber of suitable consistency, but preferably gutta-percha.

I prefer to produce a center piece (designated by 3) of the required size and shape by means of suitable dies operated by sufficiently powerful presses. This center piece 55 or filling is preferably too bulky for the capacity of the finished shell. The shell I preferably form in two hemispherical segments. (Designated in Fig. 2 by 4 and 5, respectively.) 60 Along its bottom edge the upper segment 4 is internally recessed at 6, the top edge of the lower segment 5 being externally recessed at 7 to match, so that the upper segment fits upon the lower like a lid upon a box, the recessed edges thus forming a lap-joint. The 65 previously-formed center piece 3 is placed between said segments, and these assembled parts are placed between forming-dies—as, for instance, 8 and 9—whereupon the dies are 70 brought together by means of suitable mechanism, whereby the shells are forced together until their edges are in intimate contact. The edges may be cemented, or the material of the segments may be otherwise put in proper condition for the adherence of said edges under 75 pressure, and when required the dies may be heated by steam or otherwise for bringing the material of the segments into suitable condition and consistency for uniting them and completing the shell. As will be observed at Fig. 2, the edges of the shell lap before pressure 80 is put upon the core, so that the latter is prevented from squeezing out during the compressing action of the dies. The parts may 85 be so proportioned that by the time the shell is fully closed the core will have been given the requisite compression, and the cement previously applied to the edges may be relied upon to hold the shell-segments together. Preferably, however, the lapping edges of the segments are made somewhat full, thereby to 90 furnish material for properly forming the joint between them as they are subjected to the final compression, at which operation the ball is finally shaped and at the same time 95 the material of the shell is compressed between the dies and the resisting mass within the shell. Since this central portion is first prepared somewhat oversize and the shell is 100

compressed over the same, as explained, the resistance of said central portion while under such compression furnishes a substantial support for sustaining the relatively thin shell against the pressure of the forming-dies. By properly sizing the central pieces the shells when being finished may be sustained against any necessary degree of pressure of the dies. By the provision of lap-joints a large increase in the area of welding-surface is secured, so that the segments are more securely knit together at the compressing operation, and the liability of the joint opening at the impact of a playing implement is minimized. The compression of the ball is maintained while the shell cools and hardens, so that the latter may hold the ball under permanent compression or grip.

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 all cases that the core be condensed in bulk so long as when the ball is finished the core is gripped by the shell.

My present improvements in construction and method are applicable not only to golf-balls, but also to balls for use in playing billiards and analogous games, and it will be understood that the thickness of the shell and also the firmness and relative size of the center pieces may be varied in accordance with the requirements of any particular game or use for which the balls may be employed.

I usually make the exterior surface of golf-balls pebbled or corrugated to any design or configuration which may be preferred by the players. The balls are represented in Fig. 1 as furnished on the exterior surface with relatively slight elevations of a spherical conformation. In billiard-balls of course the outer surface should usually be a smooth and true spherical surface.

For a golf-ball the shell is preferably made of celluloid, which is stiff and springy, and hence highly desirable for use in this game, while the interior is preferably made of gutta-percha. The object of such a combination is to produce a twofold springiness in the ball or, in other words, to enable the elasticity of the filling to cooperate with the springiness of the shell, so as to instantly restore the latter to its normal shape after distortion by a blow. The elasticity of the filling or its

promptness in recovering from a blow is greatly augmented by having it under compression, since the outward pressure thereof tends constantly to cause the shell to assume a spherical shape, or, in other words, outward pressure, such as caused by compression, is of great material assistance in enabling the ball to spring instantly back to its original shape, and hence rebound when thrown against an object, as well as to fly more rapidly and for a greater distance when struck by an implement.

In using the term "celluloid" I refer to celluloid compounds generally, and do not limit myself to any particular variety of such compound or to any particular grade or mixture of celluloid composition.

The form and number of the segments may be varied within the scope of the present invention.

The herein-described process or method is set forth and claimed in my pending application, Serial No. 86,348, filed December 18, 1901.

Having described my invention, I claim—

1. A playing-ball comprising a shell and a relatively soft filling, the shell consisting of lap-jointed segments and the core being gripped or compressed by said shell.

2. A playing-ball comprising a shell formed of plastic material and a filling of elastic material; the shell consisting of hemispherical lap-welded segments, and the core being held under compression by said shell.

3. A playing-ball comprising a shell formed from plastic material and a filling consisting largely or wholly of gutta-percha; the shell consisting of lap-welded hemispherical segments, and the filling being held under compression by said shell.

4. A playing-ball comprising a celluloid shell and a softer filling of springy material; the shell consisting of lap-jointed segments and being compressed upon said filling.

5. A playing-ball comprising a shell which consists largely or wholly of celluloid, and a filling which consists largely or wholly of gutta-percha; said shell consisting of overlapping united segments, and being compressed upon said filling.

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Witnesses:

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