

**No. 696,889.**

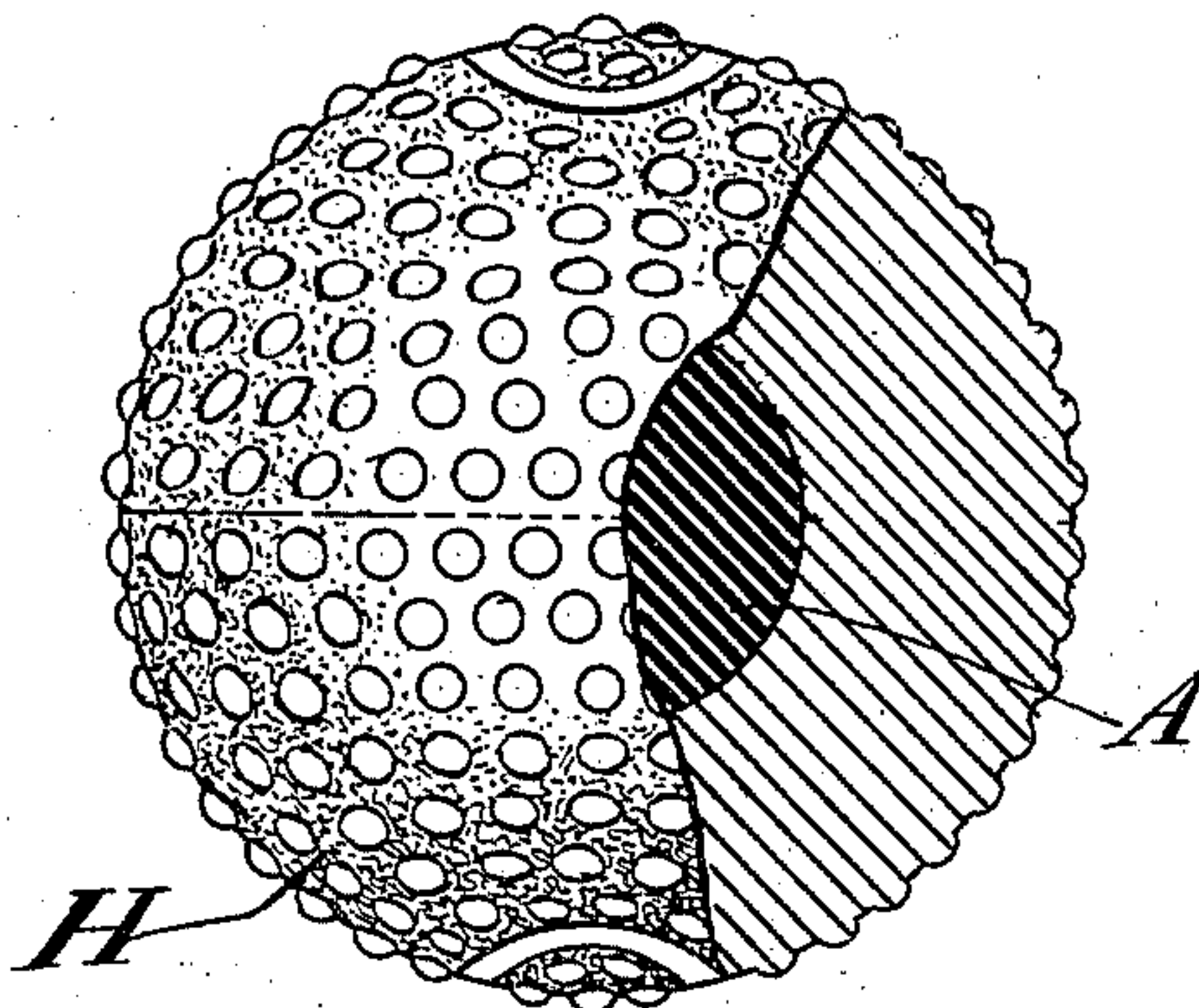
**Patented Apr. 1, 1902.**

**E. KEMPSHALL.**  
**GOLF BALL.**

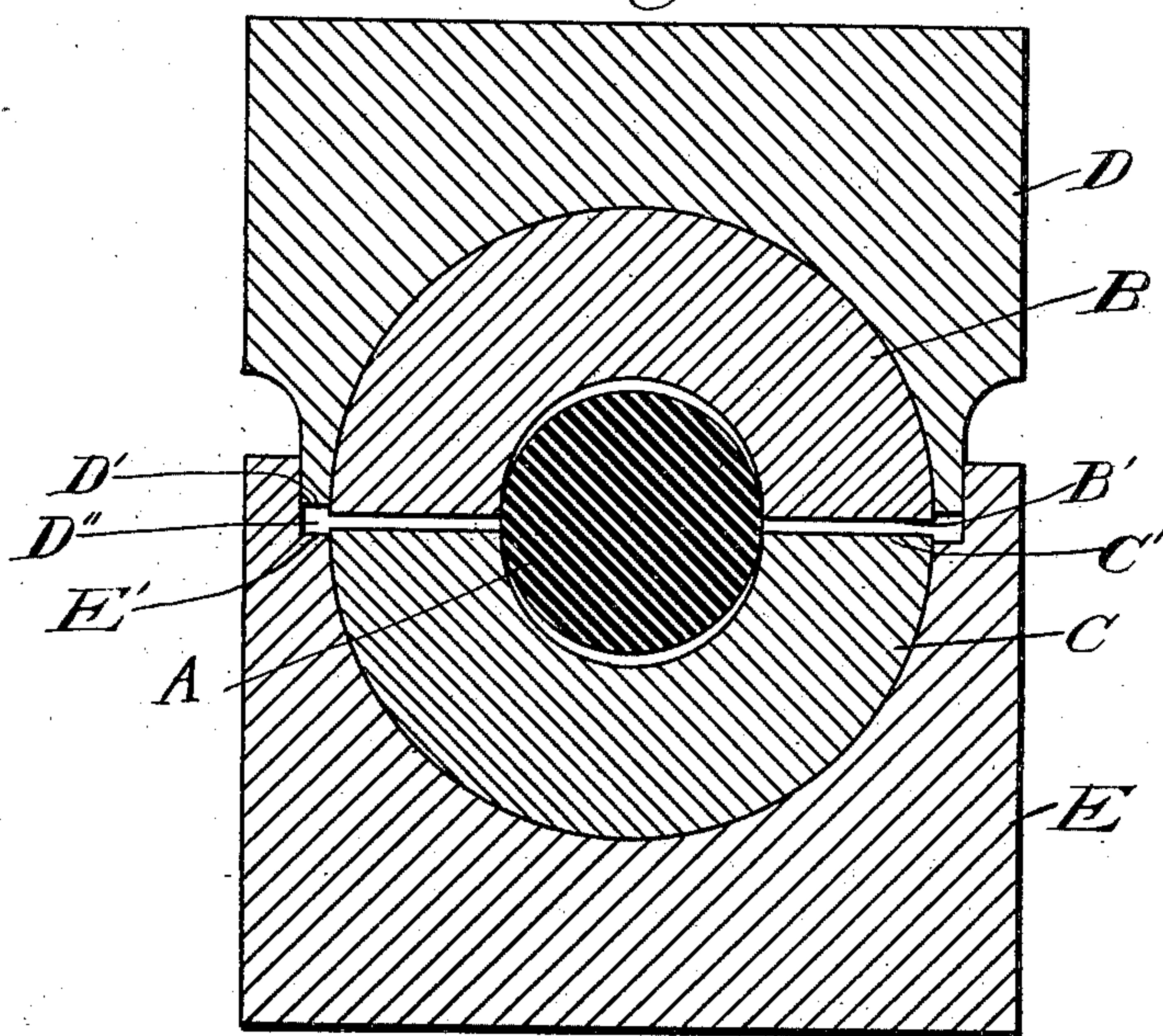
(Application filed Dec. 19, 1901.)

(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. 696,889, dated April 1, 1902.

Application filed December 19, 1901. Serial No. 86,492. (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 for use in golf and other games; and its object is to produce an improved ball at minimum cost.

In my pending application filed December 18, 1901, Serial No. 86,347, I show a ball comprising a thin gutta-percha shell compressed upon a soft-rubber core, whereby the shell is elastically supported against distortion produced by a blow. The principal component of said ball is the soft-rubber core, and the action of the ball is governed largely by the peculiarities of the mass of compressed rubber. In the present instance I aim to produce a ball consisting principally of gutta-percha, so as to have an action similar to that of a solid gutta-percha ball, without, however, being liable to become distorted or otherwise injured by the blows of an implement, as is the case with a solid ball. Moreover, I render the ball capable of a longer flight than a solid gutta-percha ball, while avoiding undue resiliency in response to a light blow.

Referring to 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 partly broken away. Fig. 2 illustrates the preferred method of manufacturing the balls.

Similar letters of reference designate like parts in the figures.

I produce a center piece (designated by A) of the required size and shape of india-rubber, preferably highly vulcanized and of firm texture. This center piece or filling is too bulky for the small hollow in the body of the ball. The latter is preferably made of well-seasoned gutta-percha of high quality, and I preferably form the same of two hemispherical masses (designated in Fig. 2 by B and C, respectively) by means of suitable apparatus, whereby said masses or segments are shaped, and the gutta-percha is subjected to a high

degree of pressure and becomes solidified and toughened. I make the diameter of the center piece A slightly less than half the outer diameter of the ball-body, the former being preferably three-quarters of an inch and the latter one inch and three-quarters. These proportions may be slightly varied within the limits of my improvements, so long as the mass or principal portion of the ball is gutta-percha provided with a rubber backing. The center piece or pellet A is placed between said segments, and these assembled parts are placed between forming-dies—as, for instance, D and E—whereupon the dies are brought together by means of suitable mechanism, forcing the shells together until their edges are in intimate contact. The gutta-percha is treated or otherwise put in proper condition for the adherence of its edges under pressure, and the dies may be heated by steam or otherwise for bringing the gutta-percha into suitable condition and consistency for uniting them and completing the ball. The hollow of the ball or the outer surface of the pellet-filling, or both, may, if desired, be treated so as to cause the rubber to adhere to the gutta-percha.

The abutting edges of the original segments at B' and C' may be made somewhat full, thereby to 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 the material of the ball is compressed between the dies and the resisting pellet A within the ball. Since this pellet is first prepared somewhat oversize and the ball-body is compressed over the same, as explained, the resistance of said pellet while under such compression furnishes a substantial support for sustaining the heated and plastic gutta-percha against the pressure of the forming-dies.

Preferably the edges B' and C' contact before much, if any, compression of the rubber core is effected, so as to avoid liability of the rubber squeezing out between said edges. Upon further action of the dies the heated gutta-percha at said edges is forced out be-



tween the approaching die faces or edges D' and E', the lower die being preferably cupped and the upper die telescoping closely therein, so as to prevent escape of the gutta-percha between the sliding die-faces at D". Upon continued action of the dies the gutta-percha which has thus been forced outwardly is squeezed out of the narrowing gap between the die edges and forced back toward the interior of the ball, thus causing a kneading of the edges of the gutta-percha shells and effectually welding them together, the high compression of the ball being maintained until the shell hardens. It is to be understood that in case condensation of the bulk of the pellet takes place at the compressing operation it is due to the presence of air-spaces or impurities in the material. It is not essential in practicing my invention that said pellet A or the material of the body H of the ball be always condensed in bulk, so long as said body grips the pellet.

By the compressing operation the gutta-percha is further compacted or solidified and put into better condition to resist wear, and the simultaneous heating and high compression is found to have a highly beneficial effect thereon. Moreover, by said operation the rubber core, although small or bullet-like, is put under considerable compression, and thereby rendered exceedingly sensitive. Thus I cause the elasticity of the compressed-rubber pellet filling to cooperate to a degree with the springiness of the compressed gutta-percha body, so as to instantly restore the latter to its normal shape after distortion by a hard blow. The promptness of the ball in responding to a hard blow is augmented by having the rubber pellet under compression, since the outward pressure thereof tends constantly to cause the ball to maintain a spherical shape, or, in other words, the outward pressure due to the constant effort of the compressed core to enlarge its confines is of assistance in enabling the ball to spring instantly back to its original shape, and hence conduces to the efficiency thereof. Moreover, owing to its compression said pellet is more resisting, and when struck it sooner reaches the limit of compression, so that less force is wasted in changing and rechanging the shape of the ball and more momentum is acquired by the ball from the implement.

Owing to the provision of the compressed-rubber core, the liability to permanent distortion of the ball, which is a fault of solid gutta-percha balls, is avoided, while owing to the large relative mass of gutta-percha the ball has the advantage of a solid gutta-percha ball. By using highly-vulcanized rubber for the filling it is enabled to withstand without injury the heating to which the gutta-percha is subjected at the compressing operation. The compressed core gives an even resistance at all portions of the ball, so that a reliable

and uniform action thereof is secured. The core is practically indestructible and, moreover, always maintains its true central position, thereby minimizing the tendency to erratic flight or movement. The rubber is relatively inexpensive, thereby reducing the cost of the ball. By making gutta-percha ball hollow it is given a resiliency *per se* which is not possessed by a solid gutta-percha ball, and this resiliency cooperates with that of the core, while the gutta-percha portion of the ball is so massive as to prevent the highly-elastic center from being affected appreciably by a light blow from an implement. By backing the gutta-percha with rubber cutting, denting, or nicking of the ball is prevented. The body of the ball may be otherwise formed, and the filling may also be otherwise formed within the scope of my invention.

I usually make the exterior surface of golf balls pebbled or corrugated to any design or configuration which may be preferred by any players. The balls are represented at Fig. 1 as furnished on the exterior surface with relatively slight elevations of a spherical conformation.

The herein-described process is made the subject of my pending application, Serial No. 87,976, filed December 31, 1901.

Having described my invention, I claim—

1. A playing-ball comprising a springy body formed from plastic material and a nucleus of springy material held under compression at the center of said body, the diameter of said nucleus being less than half the diameter of said body.

2. A playing-ball comprising a gutta-percha sphere and a round soft-rubber core, at the center of said gutta-percha sphere and held under compression thereby; the diameter of said rubber core being a little less than half that of said gutta-percha sphere.

3. A playing-ball, consisting of a body built up from previously-formed gutta-percha spherical sections, said sections being joined edge to edge, and a filling of soft rubber held under compression within said body, the diameter of said soft-rubber filling being less than half that of said gutta-percha body.

4. A playing-ball comprising a body built up of previously-shaped and highly-compressed hemispherical sections of well-seasoned gutta-percha, and a spherical filling of highly-vulcanized solid soft rubber held under compression within said body; the relative diameters of said filling and said body being substantially as three-fourths to one and three-fourths.

5. A playing-ball comprising a pellet of soft rubber and compressed spherical sections of gutta-percha welded thereon at their edges, the diameter of said pellet being less than half the diameter of the gutta-percha sphere.

6. A playing-ball comprising a sphere of highly-compressed gutta-percha having at its



center a pellet of soft rubber, the diameter of said pellet being less than half the diameter of said gutta-percha sphere.

5 7. A playing-ball comprising a compressed springy body formed from plastic material, and a nucleus of softer elastic material held under compression at the center of said body,

the diameter of said nucleus being not more than half the diameter of said body.

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Witnesses:

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