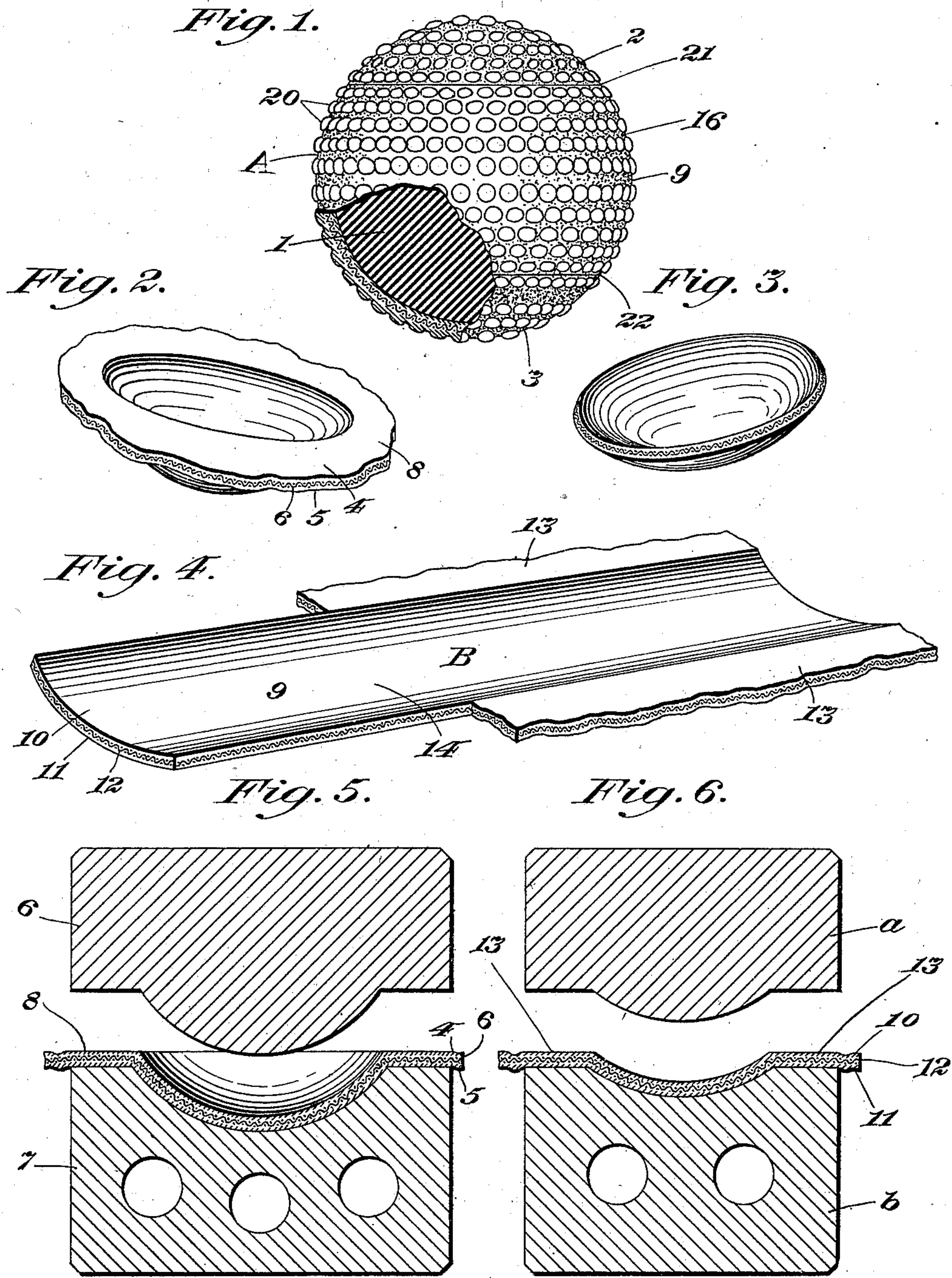


E. KEMPSHALL.
GOLF BALL.

(Application filed Apr. 16, 1902.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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2 Sheets—Sheet 2.

Fig. 7.

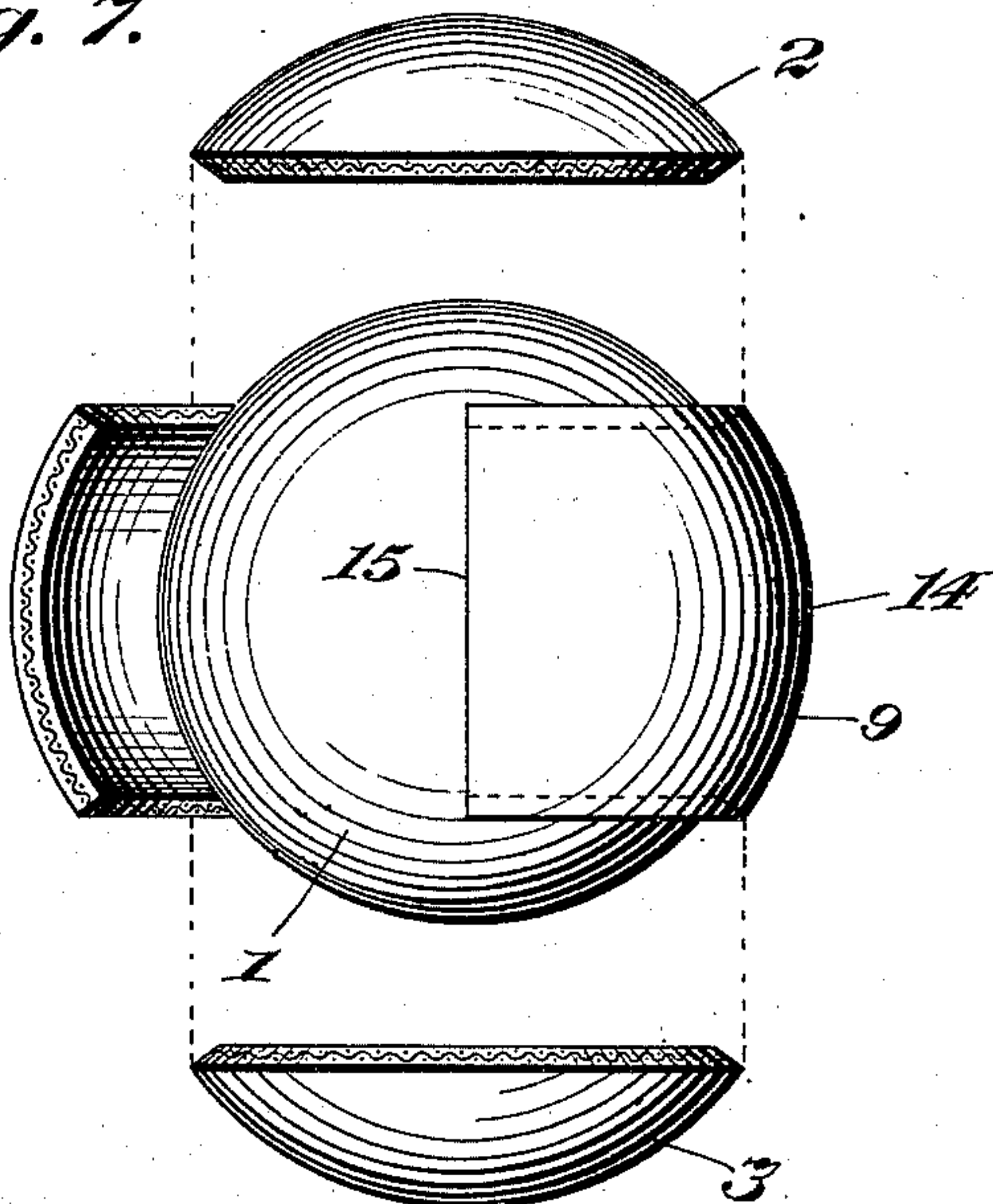


Fig. 8.

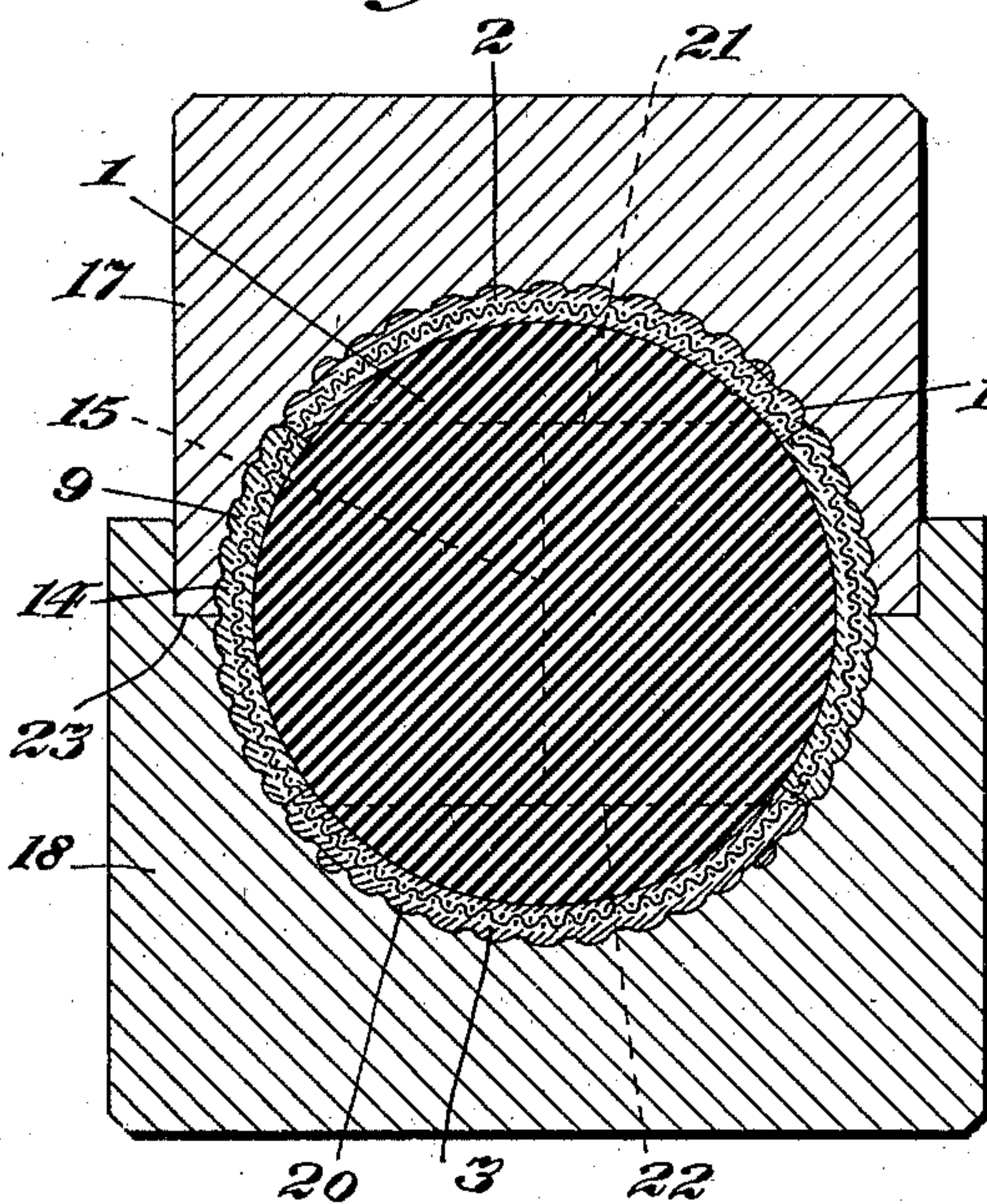
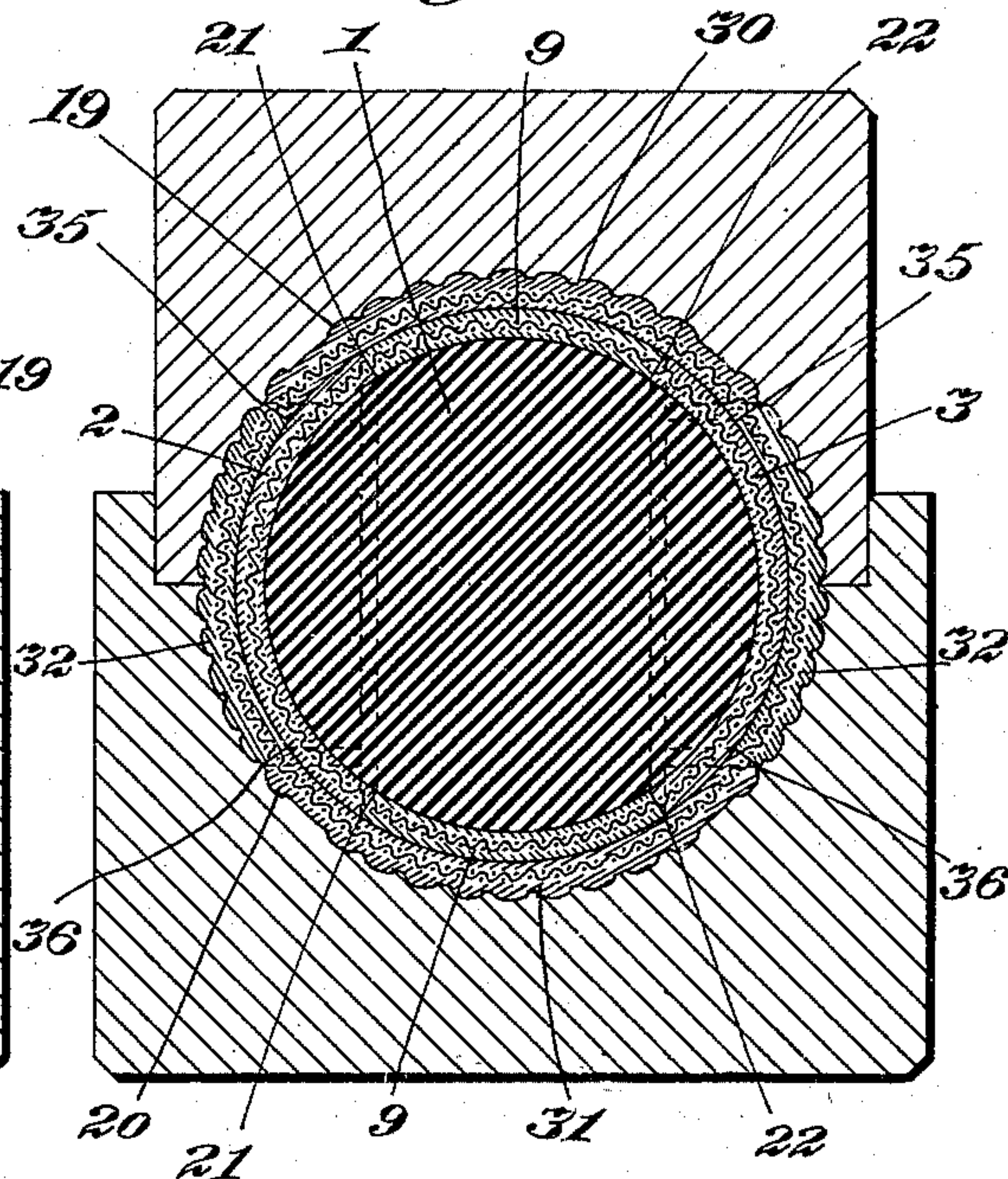


Fig. 9.



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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. 705,766, dated July 29, 1902.

Application filed April 16, 1902. Serial No. 103,221. (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 particularly described.

The principal object of the invention is to provide a playing-ball adapted to all the essential requirements of golf and other games wherein the ball is propelled by impact of a stick or other implement in the hands of the operator or player.

The invention also has certain other objects in view, as will hereinafter more fully appear when taken in connection with the accompanying drawings, in which—

Figure 1 is a part-sectional view of a completed ball constructed in accordance with my present improvements. Fig. 2 is a view in perspective of one of the cups or segments contributing to the make-up or formation of the external structure of the ball, said view showing the cup or segment previous to the trimming of the edge thereof after being struck up by the forming-dies. Fig. 3 is a similar view of one of the cups or segments when trimmed or finished ready to be applied to the body or center of the ball. Fig. 4 is a view in perspective of a strip of the material applied to the body or center intermediate the adjacent edges of the cups or segments, said strip being shown as only partly trimmed or finished at the edges. Fig. 5 is a part-sectional view of one means which may be employed for forming or producing the unfinished cup or segment shown at Fig. 2. Fig. 6 is also a part-sectional view of means which may be employed to form a strip such as is indicated at the untrimmed portion of the strip shown in Fig. 4. Fig. 7 is a part-sectional view of my improved playing-ball at a certain stage in the process of manufacture thereof previous to compression of the structure in the heated dies for that purpose. Fig. 8 is a sectional view of one means which may be employed in the final step of the process of manufacture of the ball. Fig. 9 is

a similar view representing also certain modified features of the external structure of the ball.

With general reference to playing-balls of this particular class or type it may be stated that in many instances hitherto it has been the practice to construct the ball by applying to a suitable center or core approximately hemispherical sections of some material, such as gutta-percha or celluloid or some other compound or derivative of pyroxylin, and then joining the edges of the sections by compression of the ball structure under heat. As thus constructed the ball on removal from the dies sometimes presents a circumferential fin or excrescence which is trimmed off in a manner not to impair the constituency of the external elements of the ball structure, the presence of such fin being due in a measure to imperfect approximation of the meeting edges or faces of the compression-dies and also to the fact that in most cases the meeting-point of the edges of the hemispherical ball-sections is substantially coincident with the meeting-point of the die-faces, thereby rendering it sometimes possible for some of the material of such sections to be squeezed outwardly between the die-faces when the dies are brought together.

According to my present invention I apply to the center or core of the ball comparatively shallow cups or segments of suitable material the dimensions of which are considerably less than the semidiameter of the finished ball, and I also apply to said center or core, intermediate the edges of the cups or segments, a band, also of suitable material, the adjacent edges of the segments and band being joined or welded together under heat and compression similarly as in the instances of the hemispherical sections hereinbefore mentioned. I employ substantially the same form of dies for compressing the ball structure, the faces thereof meeting or coming together at the approximate equatorial line of the ball; but due to the particular construction and organization of the elements of the outer structure of the ball the joints between the edges of the segments and band are brought considerably beyond or to either side of such line, and therefore a more equal and

uniform distribution of the material of the segments and band is had, with less liability to formation or production of a fin upon the ball by the action of the dies and which is a decided advantage in the manufacture of the ball. Other advantages of special construction of ball herein shown will hereinafter more fully appear.

Specific reference being had to the accompanying drawings by the designating characters marked thereon, A, Fig. 1, represents a completed playing-ball the elements of which are constructed and organized substantially in accordance with my present improvements, said ball comprising a body or center 1 of any suitable material, such as gutta-percha, and to which are applied at opposite poles comparatively shallow cups or segments 2 and 3, also of any suitable material or substance, but which are preferably formed of celluloid and a suitable textile fabric—such, for instance, as is indicated at Fig. 3. Said cups or segments are struck up from strips constituted of layers 4 and 5 of celluloid and an intermediate layer 6 of fabric, by means of suitable heated compression-dies 6 and 7, Fig. 5, and when first removed from the dies they each present a ragged brim or edge 8, as shown at Fig. 2, but which is subsequently cut off or removed in any suitable manner to form the Fig. 3 structure. I also apply to the body or center of the ball, intermediate the edges of said shallow cups or segments 2 and 3, a band 9 of suitable material or substance, but preferably also constructed of layers 10 and 11 of celluloid, combined with an intermediate layer 12 of textile or woven fabric. Said band is struck up into the desired concave shape from a strip B of celluloid and fabric, such as is indicated at Fig. 4, by means of dies *a* and *b*, (indicated at Fig. 6,) and after removal from such dies the edges 13 13 of such strip are trimmed off in any suitable way to form the finished strip, a portion of which is designated at 14, Fig. 4. After the shallow cups or segments 2 and 3 have been applied to the body or center 1 of the ball—as indicated at Fig. 8, for instance—a portion of the finished strip 14 of sufficient length is applied to the body or center intermediate the said cups or segments in any suitable way, the ends of said strip being brought together at 15 in the formation of a band 16, Fig. 1, completely encircling the said body or center. The adjacent edges of the band and the cups or segments may be adapted to each other in any suitable way, if desired, and then when the ends of said band are finally brought together the ball structure is subjected to compression by means of the heated dies 17 and 18 at Fig. 8, and the applied or external elements of the ball are allowed to cool while maintaining such compression. The operative surfaces of said dies may be even or plain, if desired; but preferably they are pitted at 19, by which to form brambles 20 on the outer surface of

the finished ball, this being a desirable feature of construction, particularly in a golf ball. It will be seen on reference to said Fig. 8 that the joints or welds 21 and 22 between the adjacent edges of the applied shallow cups or segments and band are considerably beyond or outside the plane or point 23, at which the flat edges or faces of the operating-dies come together, such meeting-point being substantially at the approximate equatorial line of the ball, and hence the pressure of the dies serves to distribute the material of the applied elements of the structure in such manner as to produce an exceedingly homogeneous and intact shell or casing for the finished ball without the production of a fin thereon. A greater integrality of joint or weld is also had between the cups or segments and intermediate band, and a ball thus constructed will usually be found to require little, if any, subsequent dressing after removal from the said dies 17 and 18.

In some instances it is desirable to duplicate the applied elements of the ball structure, in which case the exterior shallow cups or segments 30 31, Fig. 9, are applied substantially at right angles to the cups or segments 2 and 3, and the band 32 is applied intermediate said cups or segments 30 31, so as to cross the inner band 9 substantially at right angles, the joints 35 and 36 between said external cups or segments and band being likewise beyond the new or altered equatorial line now presented by the ball as well as beyond the joints 21 and 22 between the cups or segments first applied.

A ball thus constructed possesses great stability and is compact and capable of withstanding hard blows without splitting or cracking.

It is apparent that I am not limited in practice to the precise details herein set forth.

Having described my invention, I claim—

1. A playing-ball comprising a center or core of gutta-percha, and applied cups or segments and an intermediate band, said segments and band consisting of plastic material and fabric, and being united at their edges.

2. A playing-ball comprising a spherical center or core, and applied shallow cups or segments and an intermediate band, said segments and band consisting of plastic material and fabric, and being welded together at their edges.

3. A playing-ball comprising a spherical center or core of gutta-percha, and applied shallow cups or segments and an intermediate band, said segments and band consisting of plastic material and fabric and being welded together at their edges, and said band consisting of a strip whose ends are welded together.

4. A playing-ball comprising a center or core, applied cups or segments, and an applied intermediate band composed of celluloid and fabric.

5. A playing-ball comprising a center or

core of gutta-percha, applied cups or segments, and an applied intermediate band composed of celluloid and fabric.

5 6. A playing-ball comprising a spherical center or core of gutta-percha, applied shallow cups or segments, and an applied intermediate band composed of celluloid and fabric.

10 7. A playing-ball comprising a center or core, applied cups or segments of celluloid and fabric, and an applied intermediate band composed of celluloid and fabric.

15 8. A playing-ball comprising a center or core of gutta-percha, applied cups or segments of celluloid and fabric, and an applied intermediate band composed of celluloid and fabric.

20 9. A playing-ball comprising a spherical center or core of gutta-percha, applied shallow cups or segments of celluloid and fabric, and an applied intermediate band composed of celluloid and fabric.

25 10. A playing-ball comprising a center or core, applied cups or segments, and an intermediate band joined or welded together at the edges, said segments and band consisting of plastic material and fabric.

11. A playing-ball comprising a center or

core, a plurality of sets of cups or segments applied thereto at opposite points, and an applied band intermediate the cups or segments 30 of each set.

12. A playing-ball comprising a center or core, a plurality of sets of cups or segments applied thereto at opposite points, and an applied band intermediate the cups or segments 35 of each set, the band of one set overlying the cups or segments of the next innermost set.

13. A playing-ball comprising a center or core, a plurality of sets of cups or segments applied thereto at opposite points, and an applied band joined or welded at the edges to 40 the edges of each set of said cups or segments.

14. A playing-ball comprising a center or core, a plurality of sets of cups or segments applied thereto at opposite points, and an applied band joined or welded at the edges to 45 the edges of each set of said cups or segments, the band of one set overlying the cups or segments of the next innermost set.

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