

No. 709,411.

Patented Sept. 16, 1902.

E. KEMPSHALL.
PLAYING BALL.

(Application filed May 26, 1902.)

(No Model.)

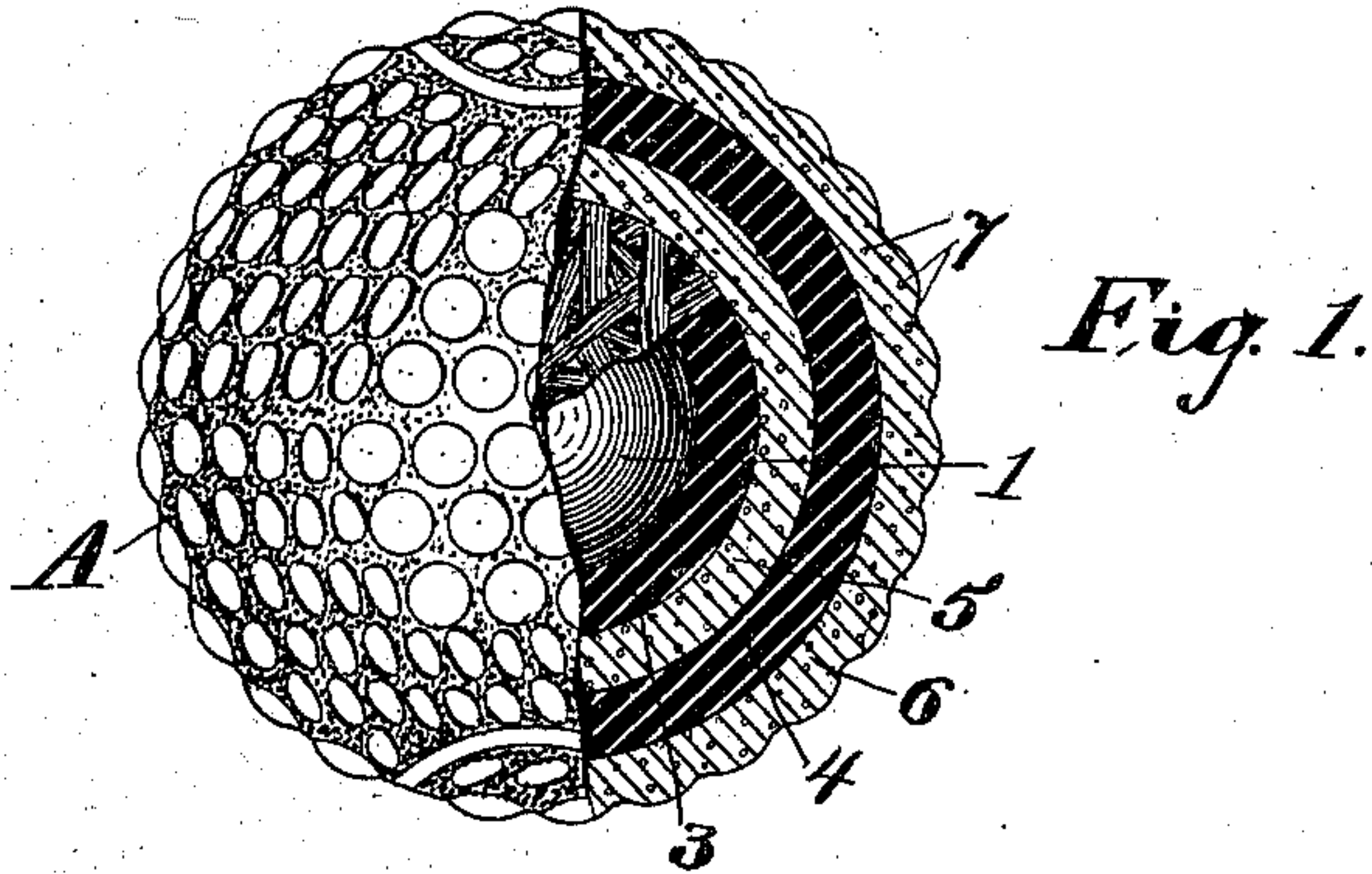


Fig. 1.

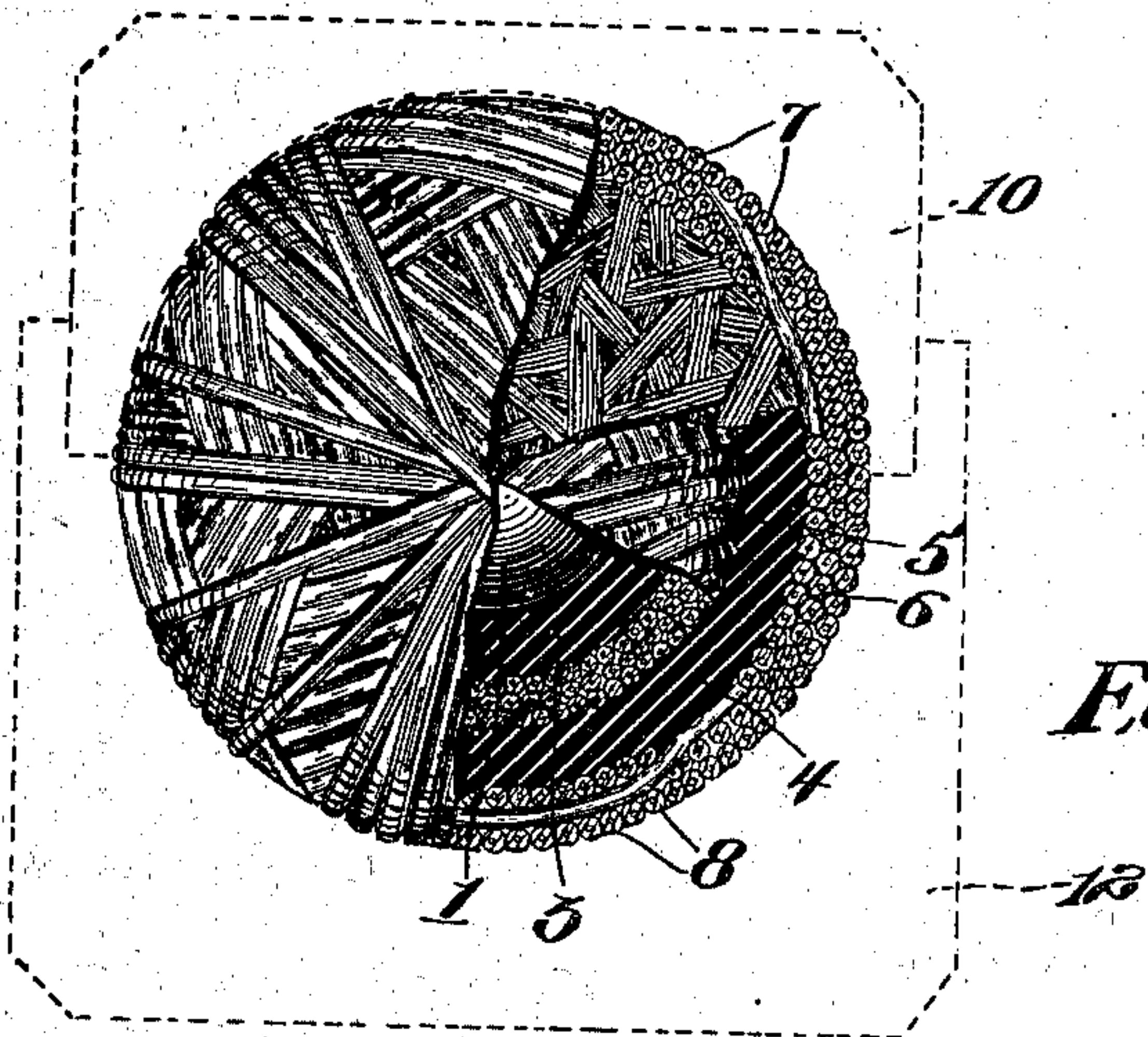


Fig. 3

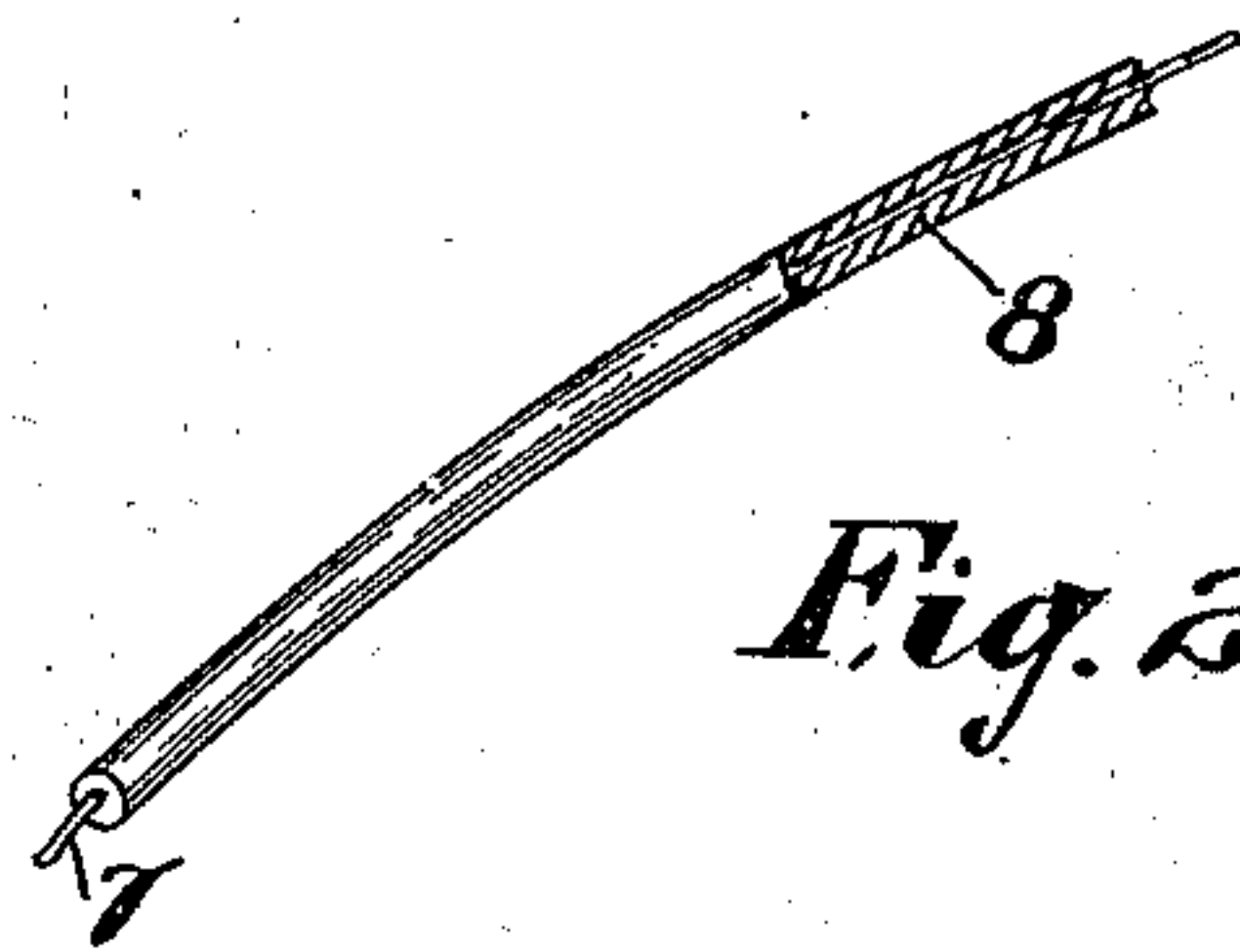


Fig. 2.

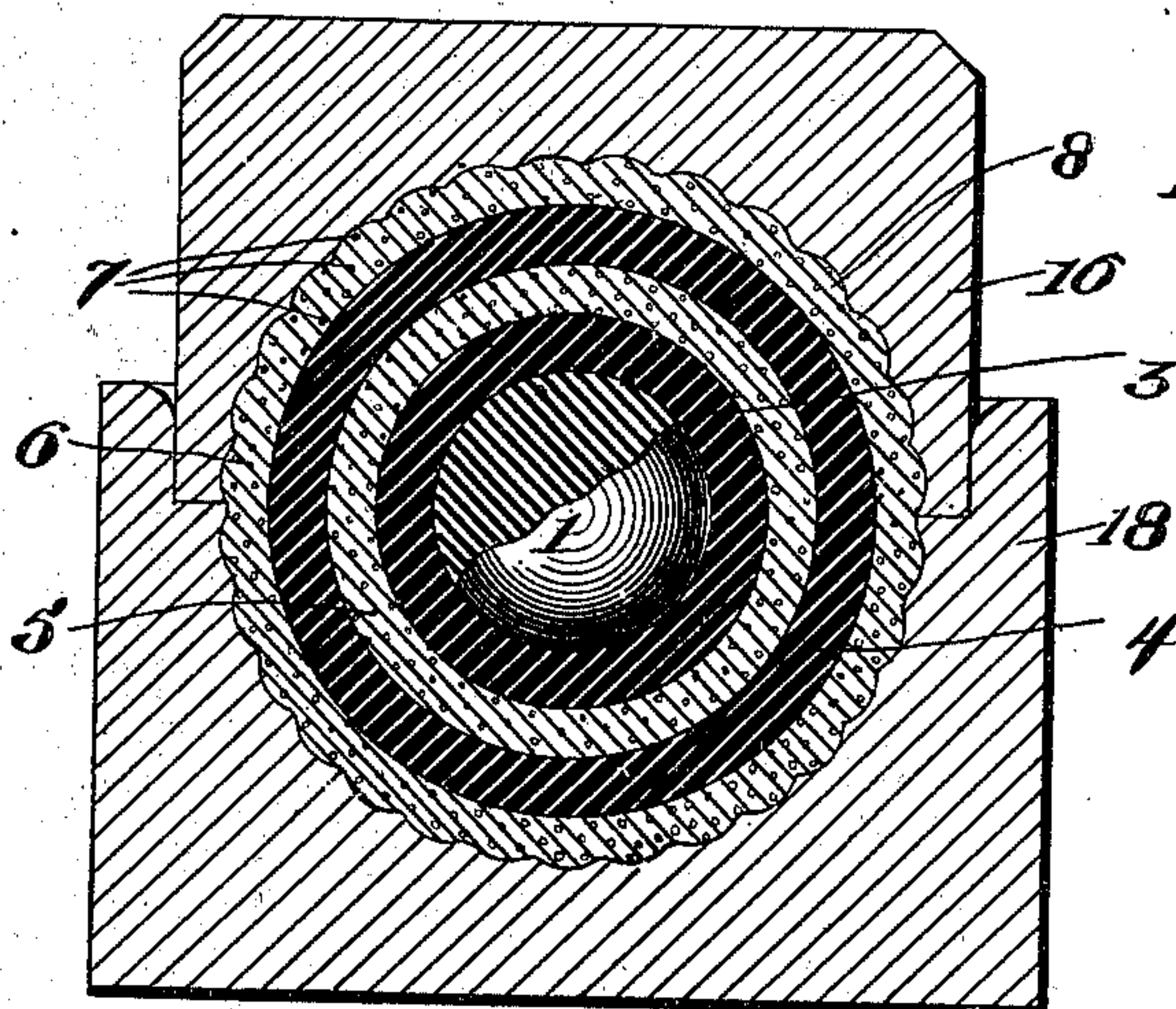


Fig. 4.

Witnesses:

B. C. Stickney
E. Everett Ellis

Inventor:

Eleazer Kempshall
By his attorney
J. H. Richards

UNITED STATES PATENT OFFICE.

ELEAZER KEMPSHALL, OF BOSTON, MASSACHUSETTS.

PLAYING-BALL.

SPECIFICATION forming part of Letters Patent No. 709,411, dated September 16, 1902.

Application filed May 26, 1902. Serial No. 108,933. (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 invention has reference more especially to playing-balls such as are employed in golf and similar games; and the principal object of the invention is to provide a seamless ball of this kind capable of withstanding all the usages of the game and one also possessing great capacity to fly under powerful impact, yet remaining comparatively dead to light blows.

A further object is to provide the body of the ball of increased strength and hardness as well as of a character in which there is no tendency to cracking or splitting.

The above and additional objects I attain by means substantially such as are illustrated in the accompanying drawings, wherein—

Figure 1 represents a part-sectional view of a completed ball made in accordance with my present improvements, and Fig. 2 is a part-sectional perspective view of a portion of composite cord employed for one of the windings of the body of the ball. Fig. 3 is a view, partly in section and partly in dotted lines, representing the ball at one stage of the manufacture thereof. Fig. 4 is a sectional view showing the ball in the final stage of manufacture.

Before proceeding with a more detailed description it may be stated that I construct my present improved ball of a spherical center piece of hard material, as gutta-percha or the like, while the body of the ball is made up of spherical envelops of elastic thread and composite cord, applied one upon the other from the center piece outwardly. I first apply to the center piece to a suitable depth or thickness a winding of elastic thread, preferably under tension and in the presence of heat, if desired. To said envelop or winding I then apply, also to a suitable depth or thickness, a similar envelop or winding of composite cord, and to the latter I apply another en-

velop or winding of elastic thread, as before, and finally I apply an outer envelop or winding of composite cord in completion of the structure, it being understood that as many of the alternating envelops or windings may be employed as desired. Said envelop-windings of composite cord may also be applied under tension, the said cord comprising in its composition a sheathing or covering of a derivative of pyroxylin, such as celluloid, which is rendered plastic in the presence of heat, so that portions of the cord are made to adhere one to another where they cross. When brought to this stage, the ball structure may be rendered compact and solid by subjecting the same to preliminary compression between dies, although such compression is not essential in all instances; but finally the ball is finished in heated dies for the purpose. I thus provide a playing-ball of the character named in which there are no seams present and one also which is highly resistant to blows at all points from the outer surface to the center thereof.

Specific reference being had to the accompanying drawings, A, Fig. 1, represents a completed ball made in accordance with my present improvements, said ball being seamless and constructed of a spherical center piece 1, preferably of gutta-percha or like material, combined with spherical envelops or applied windings of elastic thread 3 and 4, alternating with which are similar spherical envelops or applied windings of composite cord 5 and 6, made up of a fibrous material 7, Fig. 2, having a covering or sheathing 8 of some modification or derivative of pyroxylin, such as celluloid. An envelop of the elastic thread is first applied to the center piece, the winding being effected, preferably, under tension and, if desired, in the presence of heat, the successive portions of said thread being made to cross each other in various directions, as may be noted in Fig. 1. To said envelop or winding I then apply an envelop of the composite cord, the winding of which is also (preferably) effected under tension, the successive portions of this cord being also made to cross each other in various directions, as may be seen in Fig. 3. Said composite cord is also applied under the action of heat, so as to render the celluloid

sheathing thereof plastic, and to this envelop thereof I apply an additional envelop of elastic thread wound on as before, to which in turn I apply the final or outer envelop of composite cord, which is also applied in like manner as the first. As before stated, the winding on of said alternating envelops of elastic thread and composite cord is preferably effected in the presence of heat, which softens the materials of both envelops, and thus the ball structure may be rendered a solid compact mass possessing the qualities hereinbefore mentioned. I may, if desired, subject the ball to a preliminary compression between dies 10 and 12, (shown in dotted lines, Fig. 3,) which causes the crossed elastic-thread portions and composite-cord portions to interlock by strong adherence to each other and gives to the ball a substantially spherical form. The ball is finally placed between finishing-dies 16 and 18, (indicated at Fig. 4,) whereby the structure is heated and given its final compression, the pressure being held or maintained until the whole body of the ball fully hardens.

Having described my invention, I claim—

1. A playing-ball comprising a spherical center piece, and a body composed of spherical windings of elastic material and a composite cord.

2. A playing-ball comprising a spherical center piece, and a body composed of alternating spherical envelops of windings of elastic material and a composite cord.

3. A playing-ball comprising a spherical center piece of hard elastic material and a body composed of spherical windings of elastic material and a composite cord.

4. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of alternating spherical envelops of windings of elastic material and a composite cord.

5. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of spherical windings of elastic material and a composite cord.

6. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of alternating spherical envelops of windings of elastic material and a composite cord.

7. A playing-ball comprising a spherical center piece, and a body composed of spherical windings of rubber thread and a composite cord.

8. A playing-ball comprising a spherical center piece, and a body composed of alternating spherical envelops of windings of rubber thread and a composite cord.

9. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of spherical windings of rubber thread and a composite cord.

10. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of alternating spherical envelops of windings of rubber thread and a composite cord.

ops of windings of rubber thread and a composite cord.

11. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of spherical windings of rubber thread and a composite cord.

12. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of alternating spherical envelops of windings of rubber thread and a composite cord.

13. A playing-ball comprising a spherical center piece, and a body composed of spherical windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

14. A playing-ball comprising a spherical center piece, and a body composed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

15. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of spherical windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

16. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

17. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of spherical windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

18. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of a derivative of pyroxylin.

19. A playing-ball comprising a spherical center piece, and a body composed of spherical windings of elastic material and a cord having a sheathing of celluloid.

20. A playing-ball comprising a spherical center piece, and a body composed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of celluloid.

21. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of spherical windings of elastic material and a cord having a sheathing of celluloid.

22. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of celluloid.

23. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of spherical windings of elastic material and a cord having a sheathing of celluloid.

24. A playing-ball comprising a spherical center piece of gutta-percha, and a body com-

posed of alternating spherical envelops of windings of elastic material and a cord having a sheathing of celluloid.

5 25. A playing-ball comprising a spherical center piece, and a body composed of spherical windings of rubber thread and a cord having a sheathing of plastic material.

10 26. A playing-ball comprising a spherical center piece, and a body composed of alternating spherical envelops of windings of rubber thread and a cord having a sheathing of plastic material.

15 27. A playing-ball comprising a spherical center piece of hard elastic material, and a body composed of spherical windings of rubber thread and a cord having a sheathing of plastic material.

28. A playing-ball comprising a spherical

center piece of hard elastic material, and a body composed of alternating spherical en- 20
velops of windings of rubber thread and a cord having a sheathing of plastic material.

29. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of spherical windings of rubber thread 25
and a cord having a sheathing of plastic material.

30. A playing-ball comprising a spherical center piece of gutta-percha, and a body composed of alternating spherical envelops of 30
windings of rubber thread and a cord having a sheathing of plastic material.

ELEAZER KEMPSHALL.

Witnesses:

FRED. J. DOLE,

E. EVERETT ELLIS.