

No. 704,464.

Patented July 8, 1902.

E. KEMPSHALL.

PROCESS OF MANUFACTURING PLAYING BALLS.

(Application filed Apr. 14, 1902.)

(No Model.)

Fig. 1.

A

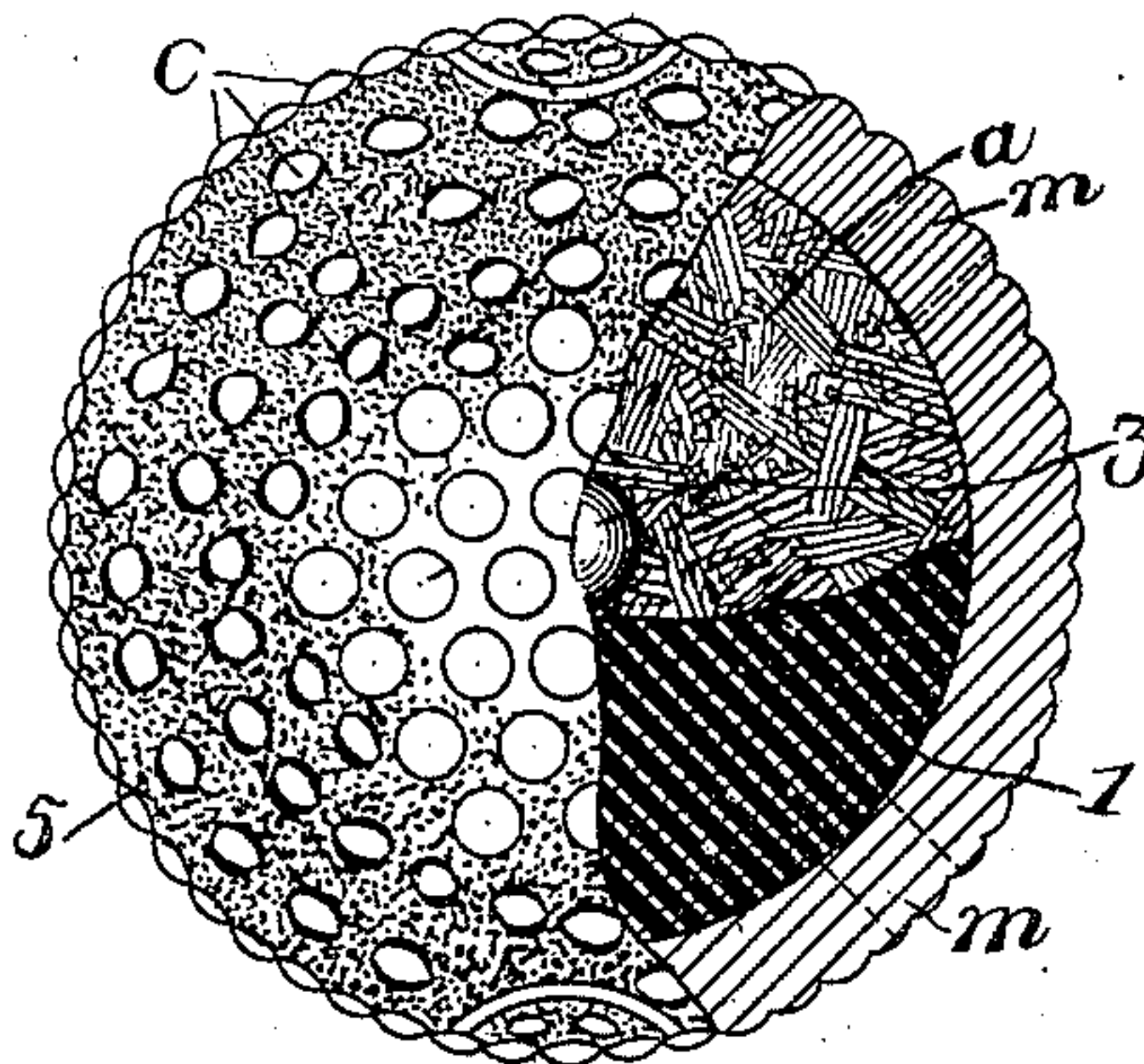


Fig. 2.

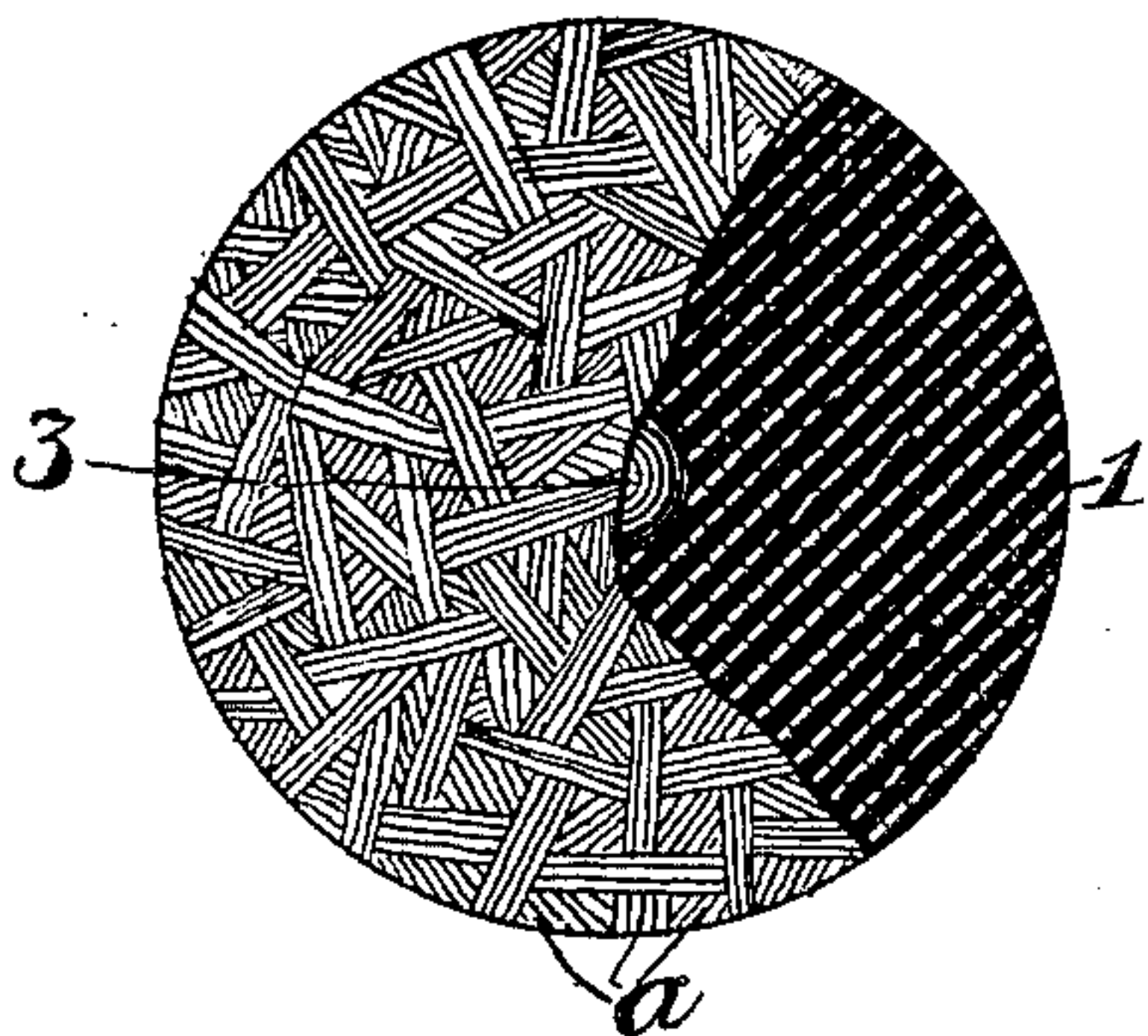


Fig. 3.

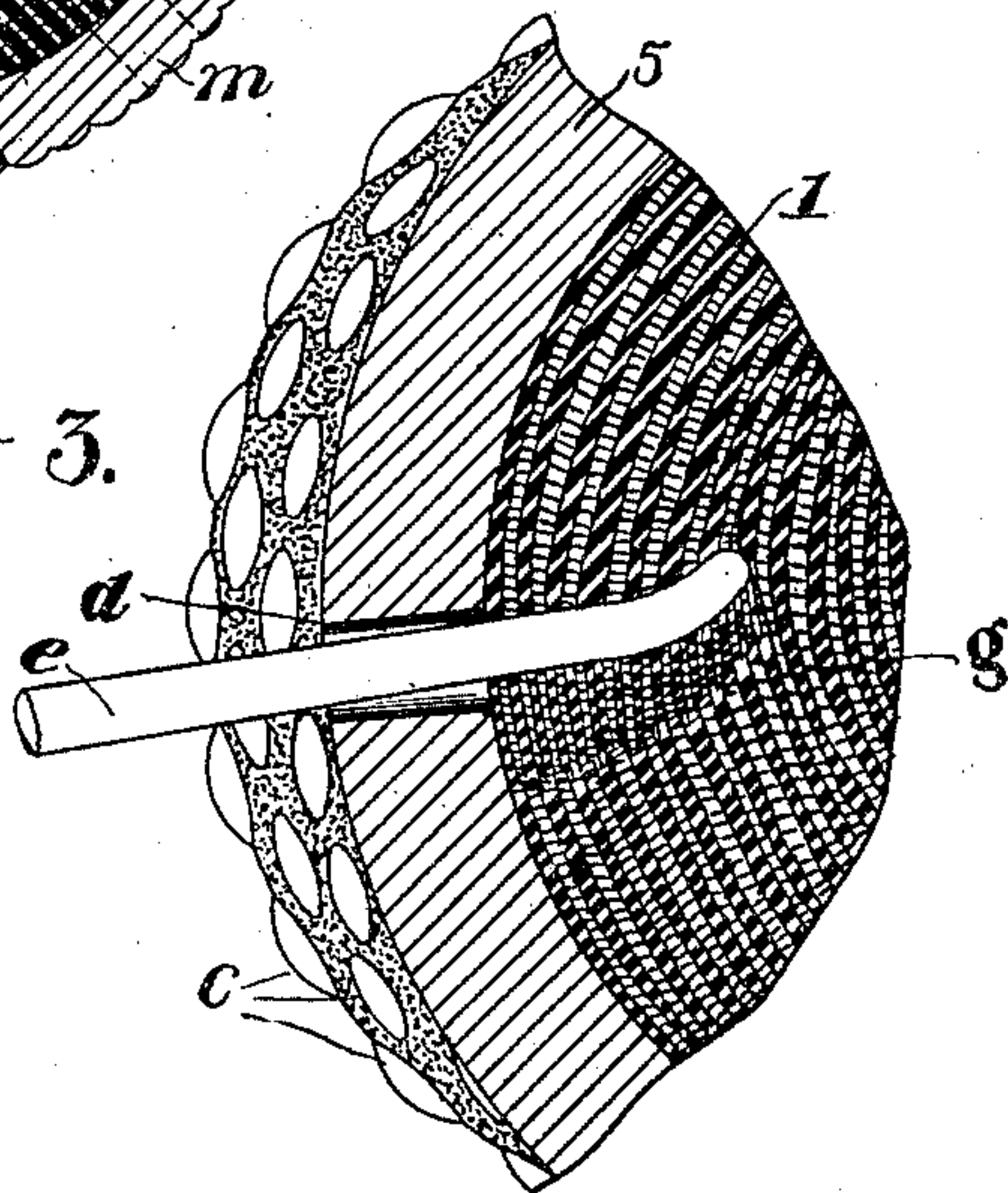
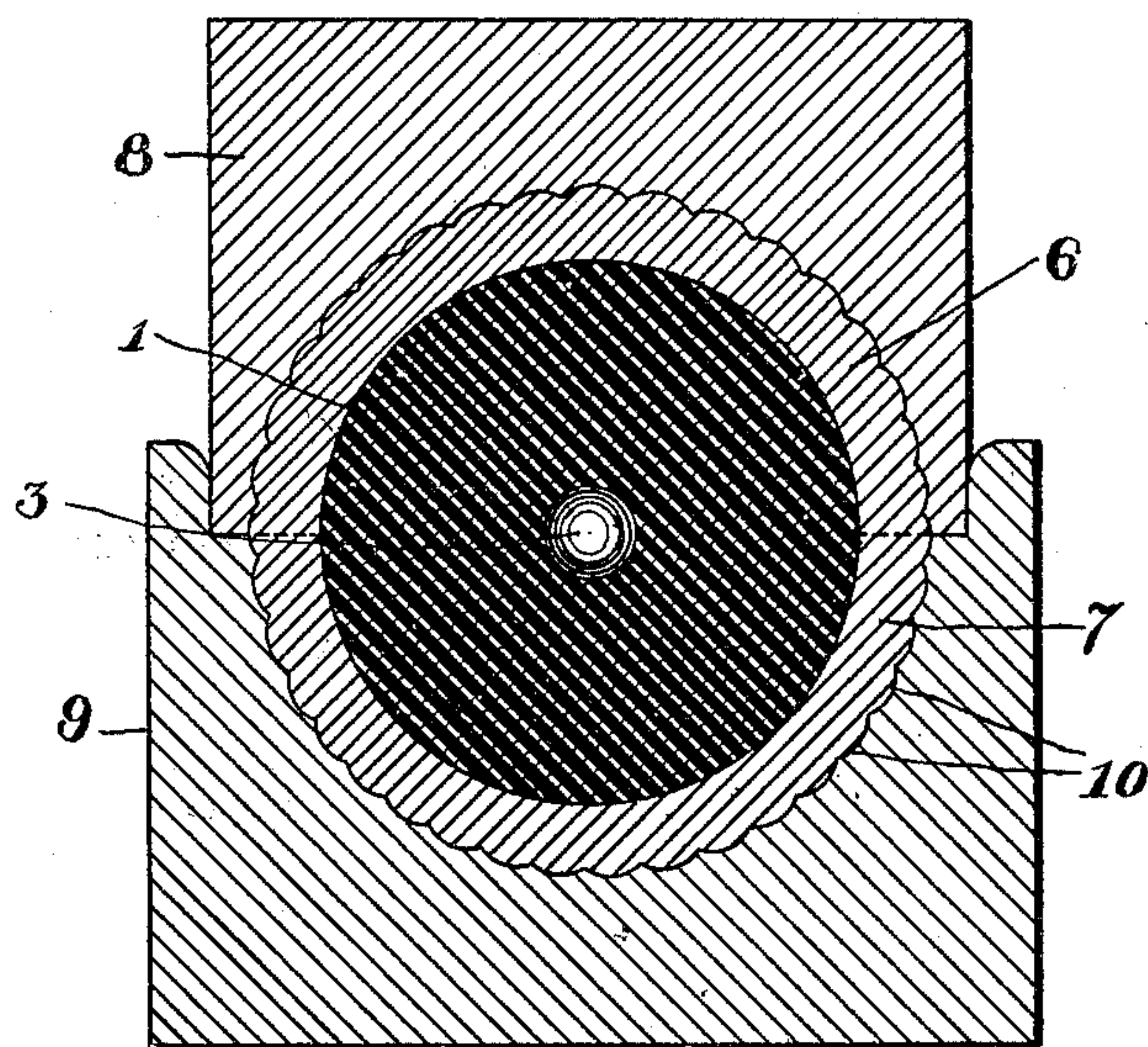


Fig. 4.



Witnesses:

A. C. Trudeau.

Fred. Maynard.

Inventor:

Eleazer Kempshall.

By his Attorney,

J. H. Richards.

UNITED STATES PATENT OFFICE.

ELEAZER KEMPSHALL, OF BOSTON, MASSACHUSETTS.

PROCESS OF MANUFACTURING PLAYING-BALLS.

SPECIFICATION forming part of Letters Patent No. 704,464, dated July 8, 1902.

Application filed April 14, 1902. Serial No. 102,804. (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 Processes of Manufacture of Playing-Balls, of which the following is a specification.

This invention relates to processes for making playing-balls; and it consists substantially in the improvements hereinafter described.

The principal object of the invention is to provide a means or process for making a playing-ball which will retain its shape or symmetry of form under all the usages of golf and similar games in which the ball is propelled by impact of a stick or other implement in the hands of the operator.

A further object is to provide a means or process for making a golf or other playing ball of a highly - elastic character and one possessing compactness and strength combined with integrity and durability and also having the quality of quick recovery from a blow, whereby none of the energy or force of the blow is lost or misspent.

My improved process also has other objects in view, as will hereinafter more fully appear when taken in connection with the accompanying drawings, wherein—

Figure 1 is a part-sectional view of a playing-ball substantially as it appears when finished or after having passed through the several steps of my improved process for making the same. Fig. 2 is a part-sectional view of the ball structure prior to the application thereto of the external structure or shell. Fig. 3 is an enlarged sectional view in detail, representing one of the steps practiced in my improved process of making the ball. Fig. 4 is a sectional view of one means which may be employed for the carrying out of practically the final or last step of my improved process.

Preliminary to a more detailed description it may be stated that in the practice of my present improved process for making playing-balls a ball is produced the interior of which is highly elastic in character, while the external structure or shell thereof is preferably hard, yet resilient, the two said elements being so constructed and organized as

to impart to the ball an increased inherent capacity of returning to its normal shape after being struck a blow with a playing-stick or other implement. The said internal structure of the ball tends to spring outwardly in all directions, and this tendency, combined with the restraining tendency of the external structure or shell, results in a ball possessing the highest efficiency for the intended purposes or uses of the same.

Specific reference being had to the accompanying drawings by the designating characters marked thereon, A, Fig. 1, represents a finished ball the elements of which are constructed and organized substantially in accordance with my present process, such ball comprising a body or center 1 of special construction or embodiment, hereinafter described, and in each of the figures of the drawings I have also shown a core or filler 3 for said body or center, which may or may not be used, as desired. In the present embodiment of my invention I preferably employ a core or filler of some suitable hard elastic material—such as gutta-percha, for instance—and the said body or center 1 is applied thereto preferably in the form of windings of rubber threads *a* (see Fig. 2) under high tension, said windings crossing and recrossing each other in various directions and to any depth or thickness desired. To such body or center I apply an external structure or shell 5, Fig. 1, of some suitable hard but springy material, such as gutta-percha or celluloid or other compound or derivative of pyroxylin, such exterior structure or shell being preferably applied in the form of hemispherical sections 6 and 7, Fig. 4, and under compression in suitable heated dies 8 and 9 for the purpose. The interior surfaces of said dies may be plain, if desired; but preferably they are pitted at 10, so as to give to the surface of the completed ball a “brambled” appearance, such as indicated at *c*, Figs. 1 and 3. After removal of the ball from the dies I form suitable slots or openings *d* in the shell or external structure of the ball at one or more points, and I then insert a sharp blade or suitable instrument *e* into such opening or openings and cut or sever the tensioned rubber windings of the said body or center 1, substantially as indicated at *g*, Fig. 3, and in this way the body or center has imparted thereto a tend-

ency to spring outwardly at all points, which tendency is restrained by the external structure or shell in an obvious manner, the resultant effect being integrity and compactness of structure combined with great elasticity and other desirable qualities in a ball of this character. It will be understood, of course, that after the windings of the body or center have been uniformly cut or severed throughout the interior of the external structure or shell the said slots or openings *d* are filled up to properly restrain the severed portions of the body or center at such points and also to produce equal strength and uniformity of action at all points of the ball. At *m m*, dotted lines Fig. 1, are shown openings which have thus been plugged or filled up.

A ball constructed in accordance with my present improved process has the quality of quickly recovering from the effects of a blow, so that no permanent distortion thereof can occur, and after filling up the openings *d* in the external structure or shell the ball may or may not be subjected to further compression under heat, as desired. When first compressed in the manner hereinbefore referred to, the adjacent edges of the hemispherical segments are joined or welded together under the heat of the dies, all of which is apparent and well understood. Variations from the several steps of my improved process may be made and still be within the scope of my invention.

It is obvious that a filling of tensioned rubber may be formed in other ways than by the winding of rubber thread and also that in case windings are used the invention is not limited to thread.

Having described my invention, I claim—

1. A process of making a playing-ball, consisting in forming a body of tensioned rubber, applying an external structure or shell thereto, and piercing or cutting such body of rubber so as to relieve the tension and permit the rubber to expand in radial directions.

2. A process of making a playing-ball, consisting in forming a body or center of overwound thread, applying an external structure or shell thereto, and cutting or severing such thread.

3. A process of making a playing-ball, consisting in forming a body or center of overwound thread, applying an external structure or shell thereto under heat and compression, and cutting or severing such thread.

4. A process of making a playing-ball, consisting in forming a body or center of overwound rubber, applying an external structure or shell thereto under heat and compression, maintaining the compression until the shell hardens, and finally cutting or severing such rubber.

5. A process of making a playing-ball, consisting in forming a body or center of overwound tensioned thread, applying an external structure or shell thereto, and cutting or severing such thread.

6. A process of making a playing-ball, consisting in forming a body or center of overwound thread, applying an outer structure or shell thereto, and cutting or severing such thread.

7. A process of making a playing-ball, consisting in forming a spherical body or center of overwound rubber thread, applying an external structure or shell thereto, and cutting or severing such winds.

8. A process of making a playing-ball, consisting in forming a body or center under tension, applying an outer structure or shell to the body, and then releasing such tension to cause the body to spring outwardly at all points under restraint of the shell.

9. A process of making a playing-ball, consisting in forming a body or center of overwound thread under tension, applying an outer structure or shell to the body, and then releasing such tension to cause the body to spring outwardly at all points under restraint of the shell.

10. A process of making a playing-ball, consisting in forming a body or center of overwound elastic thread under tension, applying an outer structure or shell of hard springy material, and then releasing such tension to impart to the body a bursting tendency at all points under restraint of the shell.

11. A process of making a playing-ball, consisting in forming a spherical body or center of thread overwound upon itself, applying an external structure or shell thereto, and then severing the winds of the thread to impart to the body a bursting tendency at all points under restraint of the shell.

12. A process of making a playing-ball, consisting in forming a body or center under tension, applying an external structure or shell thereto, forming an opening in the shell, and then introducing a suitable implement into the opening and releasing such tension to impart to the body a bursting tendency at all points under restraint of the shell.

13. A process of making a playing-ball, consisting in forming a body or center under tension, applying an external structure or shell thereto, forming an opening in the shell, introducing a suitable implement into the opening and releasing such tension, and finally withdrawing the implement and filling up the opening.

14. A process of making a playing-ball, consisting in forming a body or center under tension, applying an external structure or shell thereto by compression, forming openings in the shell and introducing an implement therein and releasing such tension to impart to the body a bursting tendency at all points, then filling up the openings, and again subjecting the ball to compression under heat.

ELEAZER KEMPSHALL.

Witnesses:

B. C. STICKNEY,
JOHN O. SEIFERT.