

No. 777,045.

PATENTED DEC. 6, 1904.

F. H. RICHARDS.
PROCESS OF COVERING GOLF BALLS BY THE USE OF PLASTIC OR GUTTA
PERCHA STRIPS.

APPLICATION FILED NOV. 4, 1904.

NO MODEL.

Fig. 1.

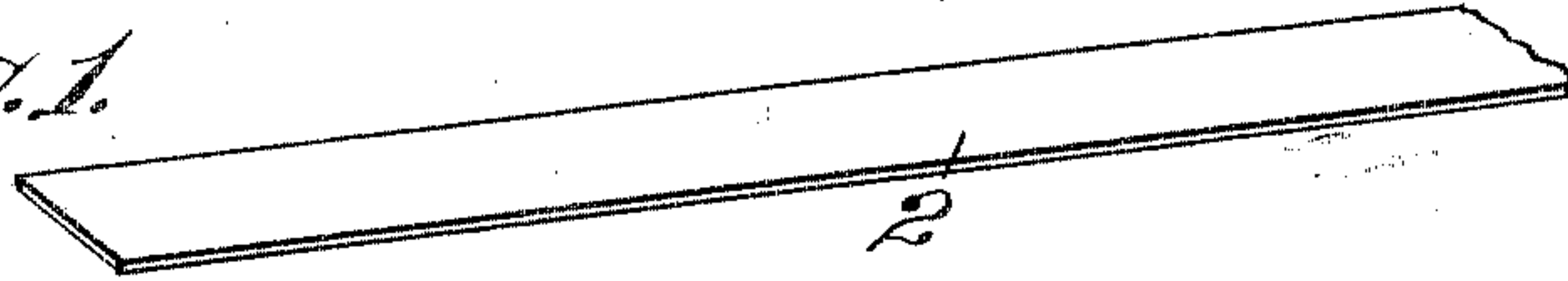


Fig. 2.

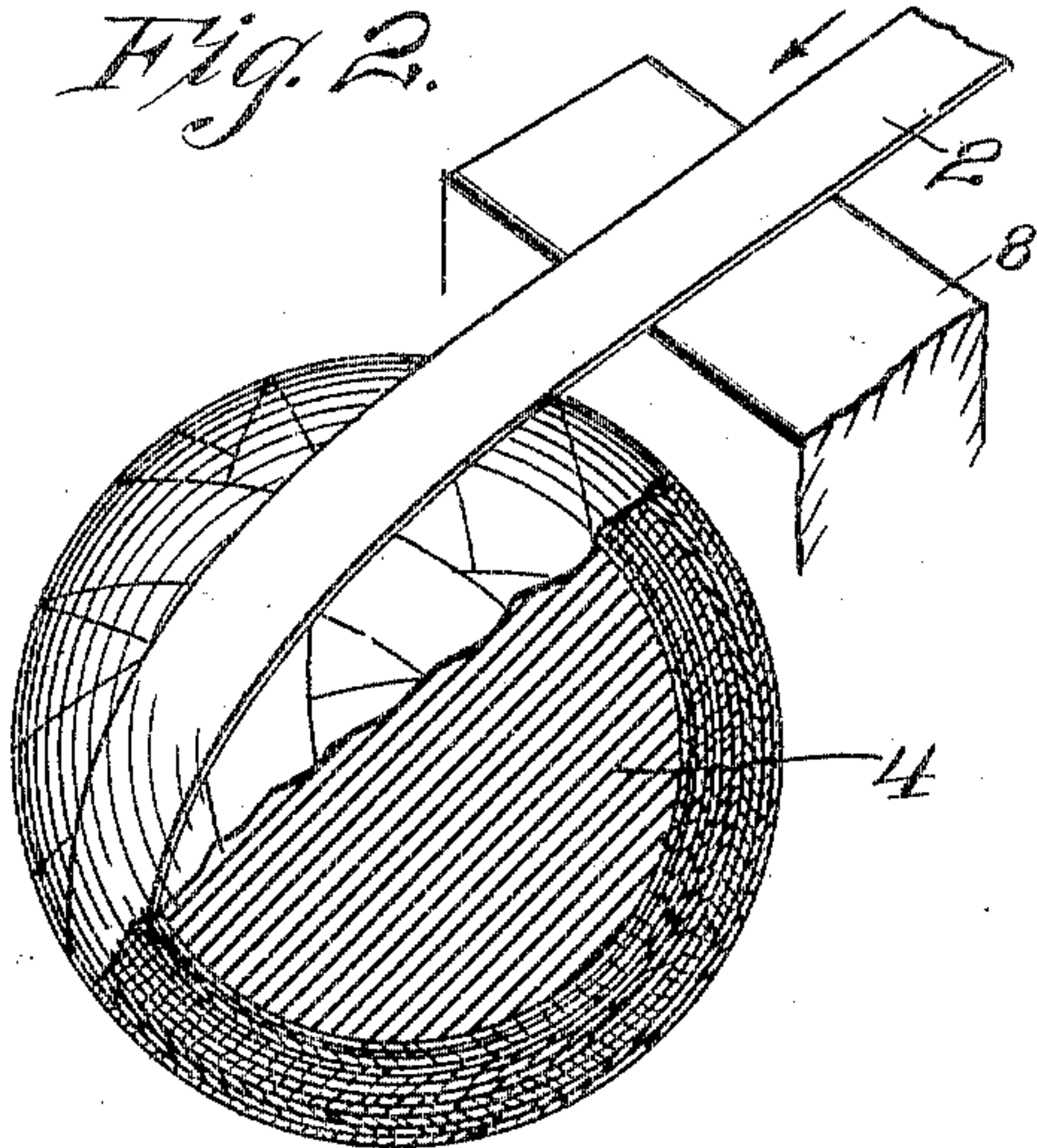


Fig. 4.

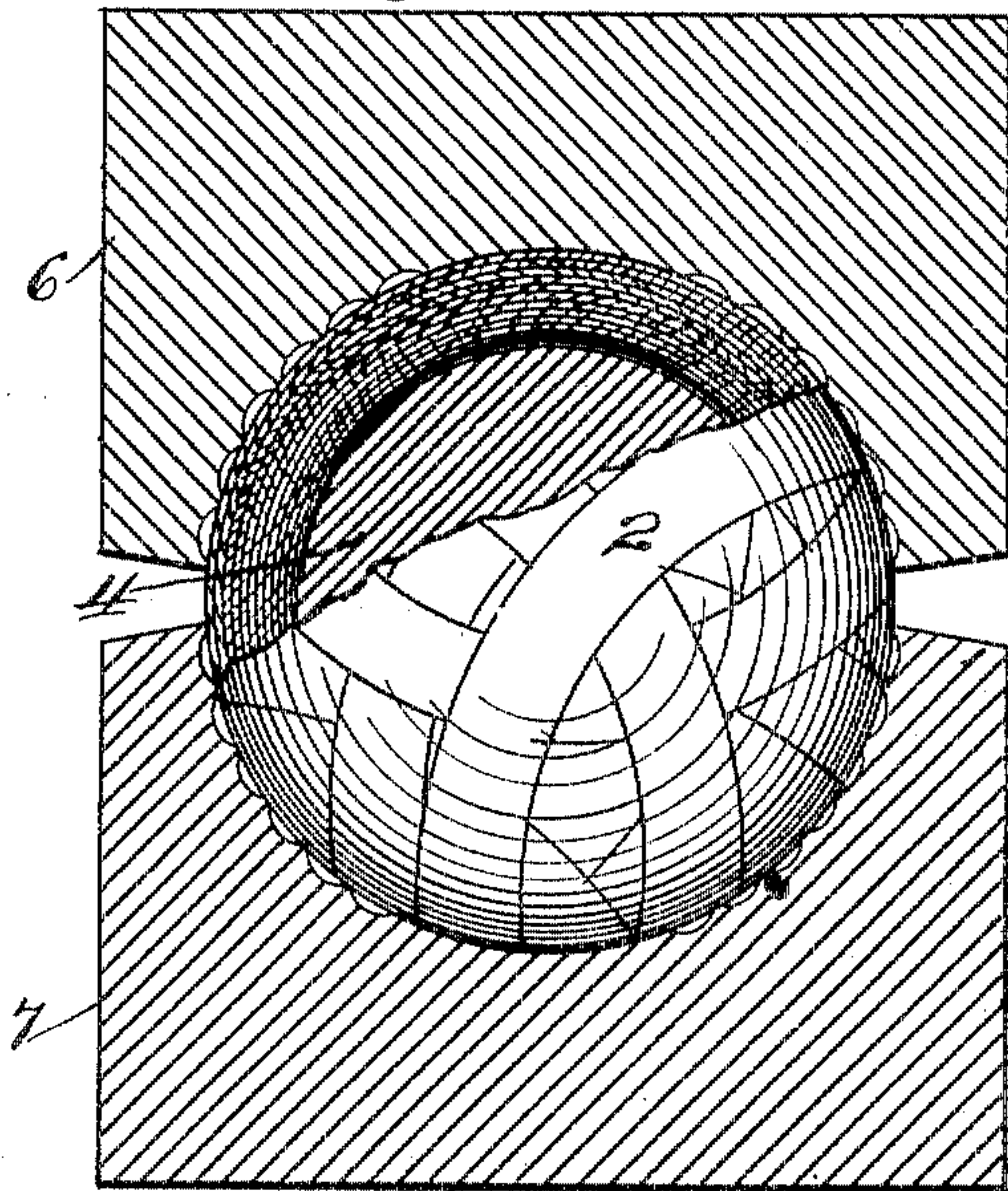


Fig. 3.

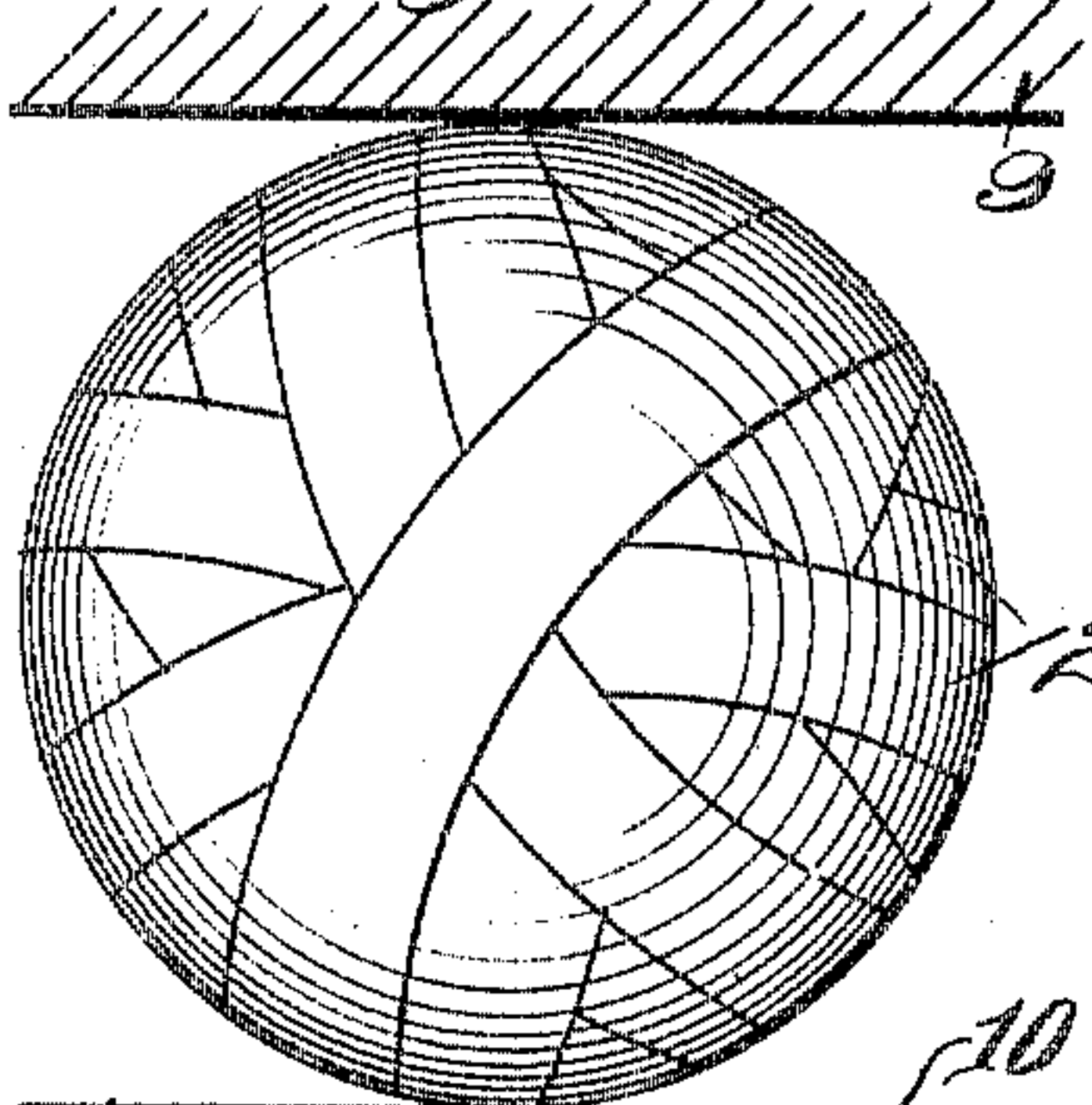


Fig. 6.

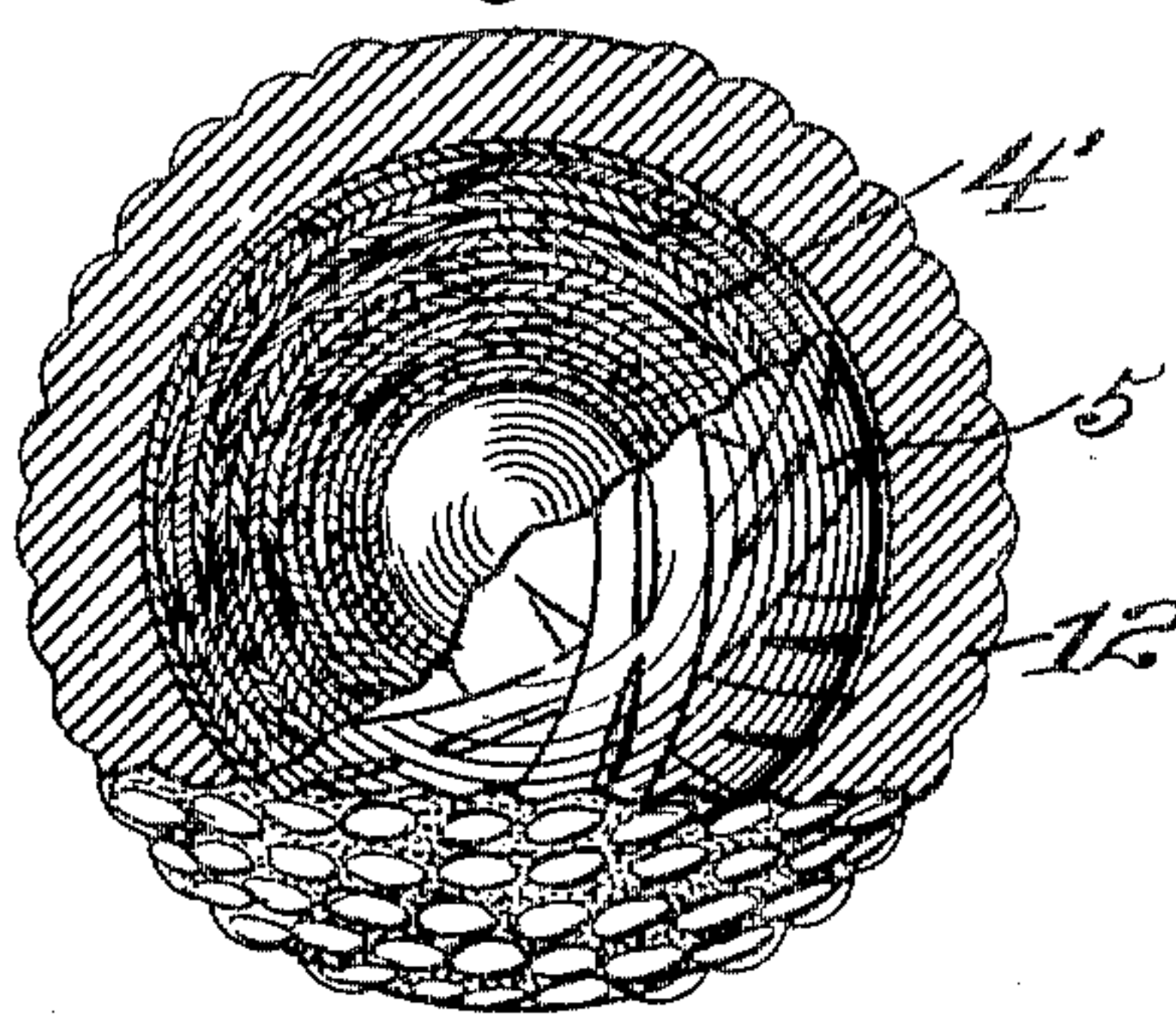
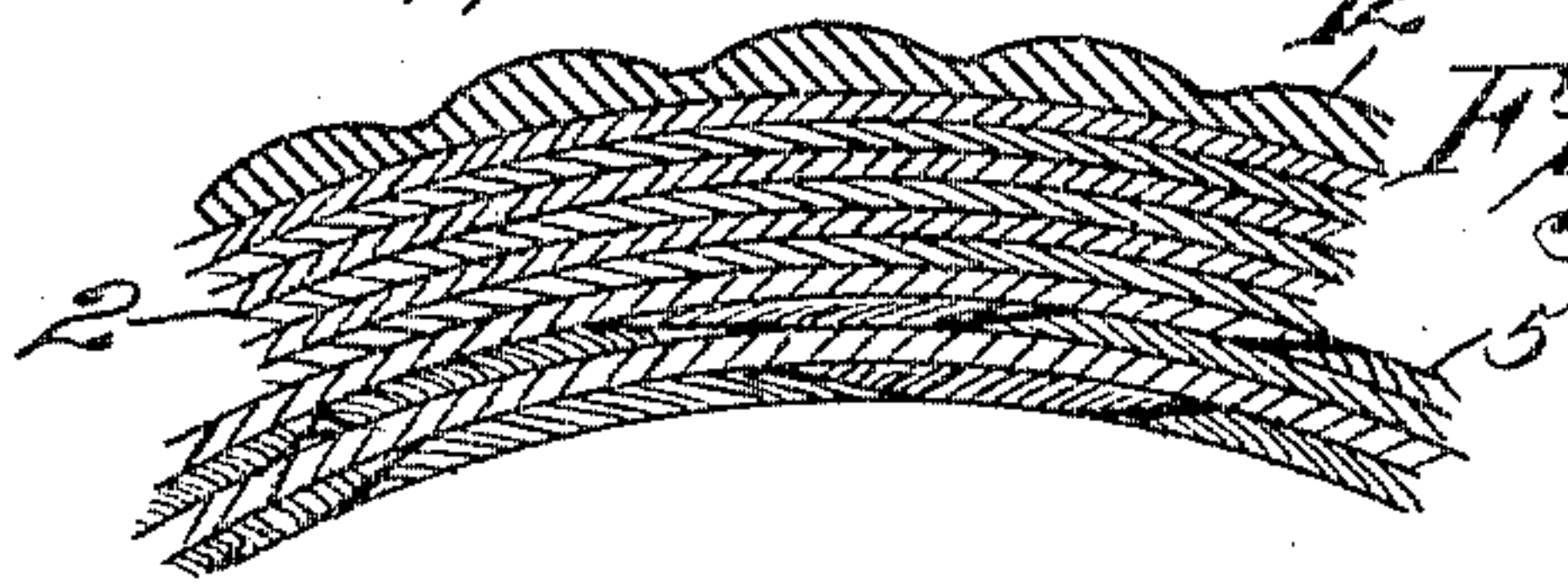


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO PERFECT GOLF BALL COMPANY, A COR-
PORATION OF MAINE.

PROCESS OF COVERING GOLF-BALLS BY THE USE OF PLASTIC OR GUTTA-PERCHA STRIPS.

SPECIFICATION forming part of Letters Patent No. 777,045, dated December 6, 1904.

Application filed November 4, 1904. Serial No. 231,336. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Processes of Covering Golf-Balls by the Use of a Plastic or Gutta-Percha Strip, of which the following is a specification.

This invention relates to the process of constructing golf-balls, it more particularly relating, however, to the process of covering such balls by the use of an improved plastic or gutta-percha strip to form the covering of such ball, such strip being so made and treated that after the same is wound upon the core or body and compressed thereon the mass of windings lying over and across each other in miscellaneous directions will be compressed and made to adhere to each other, so as to form a continuous closely-compacted integral cover or shell without any dividing seam or joint extending around the same and without any single weld-line similarly located.

In the drawings accompanying and forming a part of this specification, Figure 1 is a perspective view of a portion of this covering-strip. Fig. 2 illustrates a ball, partly in section, being wound with such strip and the treatment of such strip during such winding. Fig. 3 illustrates a step in the process of covering the core or body of the ball. Fig. 4 illustrates the ball wound with this strip and subjected to compression. Fig. 5 illustrates an enlarged section of a ball when completed with a different form of core, and Fig. 6 is a partly-sectional view of the completed ball shown in Fig. 5.

Similar characters of reference designate corresponding parts in the several figures of the drawings.

One step of the present process consists in the provision and treatment of a suitable plastic strip, preferably of gutta-percha, so that a playing-ball having its cover made up thereof will have certain advantages not present in balls heretofore made, and in carrying out this process I first provide a ribbon-like

strip 2 of a suitable plastic material—such, for instance, as gutta-percha—usually having considerable length and hard and thin and made so by rolling, and which gutta-percha strip, as is well known, is tensionally non-yielding as compared with rubber. This strip for the purpose of softening or slightly softening it to render it plastic is slightly heated, preferably by drawing it over a heated bar of iron 8, Fig. 2, or in any other desirable or suitable way—that is to say, that part which is about to be wound upon the core or body or upon preceding layers is treated in this manner, this step continuing throughout the winding of the strip, so as to, as stated, soften it and increase its plasticity to obtain an adhesion of one layer to another during the winding. As this step of softening progresses the strip is wound upon a suitable core or body 4, so as to form a mass of windings crossed and recrossed upon each other. The strip is during this step of winding comparatively tautly wound upon the core, the present form of cover, however, being particularly well adapted for a core 4', made up of a perforated ribbon-like strip 5, Figs. 5 and 6, which when wound forms a hard core, it not being intended, however, to claim in this case the core or its making independently of the cover.

The ball when roughly covered is usually and preferably somewhat rolled—as, for instance, between the hands of the operator or between suitable surfaces 9 and 10 (see Fig. 3)—to assist the spherical formation thereof and also to somewhat mold the several layers formed of the wound strips, and thus place the roughly-made ball in condition for the finishing process by compressing the same in forming or shaping dies or molds 6 and 7, by means of which the mass of windings lying over and across each other in miscellaneous directions will be compressed and made to adhere to each other, thus forming a closely-compacted cover or shell 12 without any dividing seam or joint extending around the same and without any single weld-line similarly located. Before the ball, however, is sub-

jected to the compressing step it is somewhat heated, but not sufficiently to in any way affect the core or body should this be composed of rubber or analogous material, or in place thereof the molds might be heated to the desired extent. This heating properly softens to a slight degree the material of the overwound strands. During the compressing operation, at which time the usual brambbling of the ball may also be accomplished, the dies being formed for this purpose, the mobility of the material permits the same to form or re-form the layers or strand-windings into a close-lying mass, so that the several layers are molded into one integral mass. In that form of ball in which the core is made up of a highly-elastic strip—such, for instance, as a rubber strip 5, having perforations therein, as illustrated in Figs. 5 and 6—this compression also has a tendency to force the material of the gutta-percha or plastic layer of the cover somewhat into the openings of the core, and thus form a kind of interlocking or intermeshing of the cover with such core.

From the foregoing it will be obvious that in some forms of ball the cover will be to a certain extent interlocked with the core, and in all instances the several layers of the cover will be molded and compressed into a compact and integral mass, one layer being practically indistinguishable from another.

The external windings of thin gutta-percha result in such a combination of the built-up shell or cover that on warming the shell or covering and then compressing it there is required a low heat only, not high enough to impair the elasticity of the outer layers of the core and yet enough to firmly integralize the cover or shell and give it a perfect uniformity and continuity in all points without any seam or joint, actual or incipient.

By the step of rolling the ball prior to the compressing thereof it is apprehended that the formation of the gases and the pocketing of the air during the winding operation is prevented, as well as facilitating the molding of the several layers.

By the term "core" as used herein and in the claims it is intended to mean the completed interior of a golf or other playing ball in condition to receive its cover or shell.

By the term "rolled thin" as used herein and in the claims is intended to mean that the strip is made thin by rolling.

Having thus described my invention, I claim—

1. The process of constructing the cover of a golf or other playing ball which consists in first providing a rolled-thin and hard strip of gutta-percha, then softening it and winding it in superimposed layers, and then compressing it so that the layers will become one integral mass.

2. The process of constructing the cover of a golf or other playing ball which consists in

providing a rolled-thin and hard strip of gutta-percha, then heating it, and then winding it in superimposed layers, then rolling the mass and then compressing it so that the layers will become one integral mass.

3. The process of constructing the cover of a golf or other playing ball which consists in first providing a strip of gutta-percha, then winding it in superimposed layers, then rolling the mass, and then compressing it so that the layers will become one integral mass.

4. The process of constructing a golf or other playing ball which consists in providing a pair of strips, one a rolled-thin and hard ribbon-like rubber strip and the other a ribbon-like gutta-percha strip, then winding under tension the rubber strip to form a hard core or body of superimposed layers, then treating the gutta-percha strip to render it plastic, then winding on the gutta-percha strip, then rolling the mass, then subjecting the mass to heat, and then subjecting the mass to pressure to mold the layers of the gutta-percha strip into one integral mass.

5. The process of constructing the cover of a golf or other playing ball which consists in first providing a rolled-thin strip of gutta-percha, then winding it in superimposed layers, and then compressing it so that the layers will become one integral mass.

6. The process of constructing the cover of a golf or other playing ball which consists in first providing a rolled-thin and hard ribbon-like strip of gutta-percha, then treating it to soften and render it plastic, then winding it in superimposed layers, and then compressing it so that the layers will become one integral mass.

7. The process of constructing the cover of a golf or other playing ball which consists in first providing a rolled-thin strip of gutta-percha, then treating it, then winding it in superimposed layers upon a hard core, and then compressing it so that the layers will become one integral mass.

8. The process of constructing the cover of a golf or other playing ball which consists in first providing a strip of gutta-percha, then winding it in superimposed layers upon a hard core, then heating the mass, and then compressing it so that the layers will become one integral mass.

9. The process of constructing the cover of a golf or other playing ball which consists in first providing a rolled-thin strip of gutta-percha, then softening it, then winding it in superimposed layers upon a hard core, and then heating the mass and then compressing such mass so that the layers will become one integral mass.

10. The process of constructing a golf or other playing ball which consists in first providing a strip of gutta-percha, then softening it and winding it in superimposed layers upon a hard core, then rolling the mass so wound,

and then compressing it so that the layers will become one integral mass.

11. The process of constructing the cover of a golf or other playing ball which consists in first providing a thin, ribbon-like strip of gutta-percha, then heating a part of such strip, and winding each such heated portion upon a core until the strip is wound in superimposed layers, and then compressing it so that the layers will become one integral mass.

12. The process of constructing the cover of a golf or other playing ball which consists in first providing a thin, ribbon-like strip of gutta-percha, then successively heating parts of such strip and winding such heated portions until the strip is wound in superimposed layers, then subjecting the wound mass to heat, and then compressing it so that the layers will become one integral mass.

13. The process of constructing the cover of a golf or other playing ball which consists in first providing a thin, ribbon-like strip of gutta-percha, then successively heating parts of such strip and winding such heated portions until the strip is wound in superimposed layers, then rolling the mass then subjecting the wound mass to heat, and then compressing it so that the layers will become one integral mass.

14. The process of constructing a golf or other playing ball which consists in first providing a hard, thin, narrow, ribbon-like strip of gutta-percha, then treating it to make it plastic, then winding it upon a hard body in superimposed layers to form a cover, then heating it, and then subjecting it to pressure so that the layers will become one integral mass, and simultaneously braiding the exterior of such mass.

15. The process of constructing a golf or other playing ball which consists in providing a single, continuous ribbon-like strip, then successively heating parts thereof, then winding each such heated part upon a core or body, and then subjecting the mass to pressure to mold the superimposed layers.

16. The process of constructing a golf or other playing ball which consists in forming a single continuous ribbon-like strip, then successively treating parts thereof, and winding such treated parts upon a core or body, and then further treating such wound mass, and then subjecting the mass to pressure.

17. The process of constructing a golf or other playing ball which consists in providing a perforated elastic strip and forming a core therefrom, then providing and winding

thereon a plastic strip, and then subjecting the whole to pressure.

18. The process of constructing a golf or other playing ball which consists in forming a perforated elastic strip, then winding the same under tension into a core or body, then providing and winding thereon a tensionally-non-yielding strip, and then subjecting the whole to pressure.

19. The process of constructing a golf or other playing ball which consists in providing a pair of strips, one a perforated elastic, ribbon-like strip and the other a tensionally-non-yielding strip, then winding under tension the perforated elastic strip to form a core of superimposed layers, then winding thereon the non-yielding strip, and then subjecting the mass to pressure to mold the layers of the non-elastic strip into one integral mass.

20. The process of constructing a golf or other playing ball which consists in providing a pair of strips, one a perforated, ribbon-like, rubber strip and the other a gutta-percha strip, then winding under tension the perforated rubber strip to form a core of superimposed layers, then winding thereon the gutta-percha strip, and then subjecting the mass to pressure to mold the layers of the gutta-percha strip into one integral mass.

21. The process of constructing a golf or other playing ball which consists in providing a pair of strips, one a perforated ribbon-like, pure-rubber strip and the other a gutta-percha strip, then winding under tension the perforated rubber strip to form a core of superimposed layers, then treating and winding thereon the gutta-percha strip, and then subjecting the mass to pressure to mold the layers of the gutta-percha strip into one integral mass.

22. The process of constructing a golf or other playing ball which consists in providing a pair of strips, one a perforated, ribbon-like, rubber strip and the other a gutta-percha strip, then winding under tension the perforated rubber strip to form a core of superimposed layers, then softening and winding thereon the gutta-percha strip, then rolling the mass, then subjecting it to heat, and then subjecting the mass to pressure to mold the layers of the gutta-percha strip into one integral mass.

Signed at Nos. 9 to 15 Murray street, New York, N. Y., this 3d day of November, 1904.

FRANCIS H. RICHARDS.

Witnesses:

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