

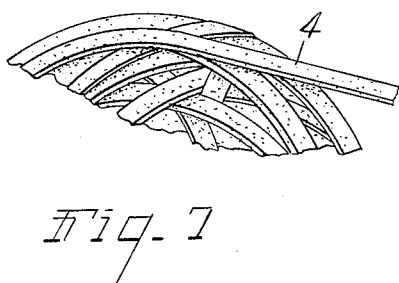
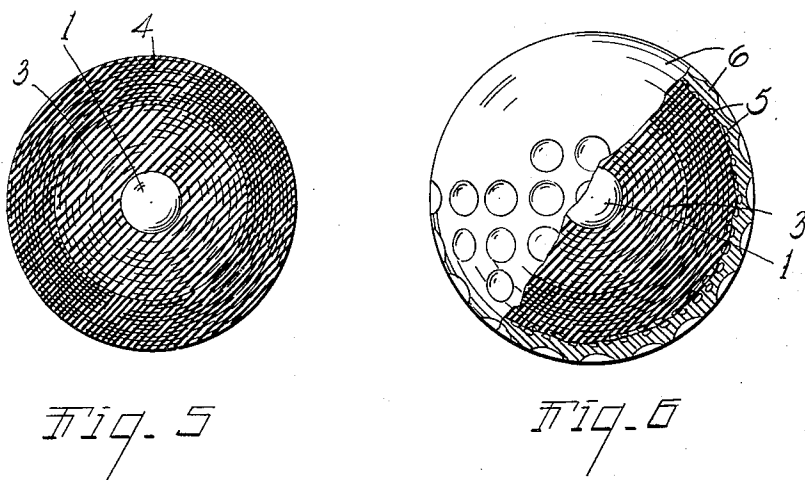
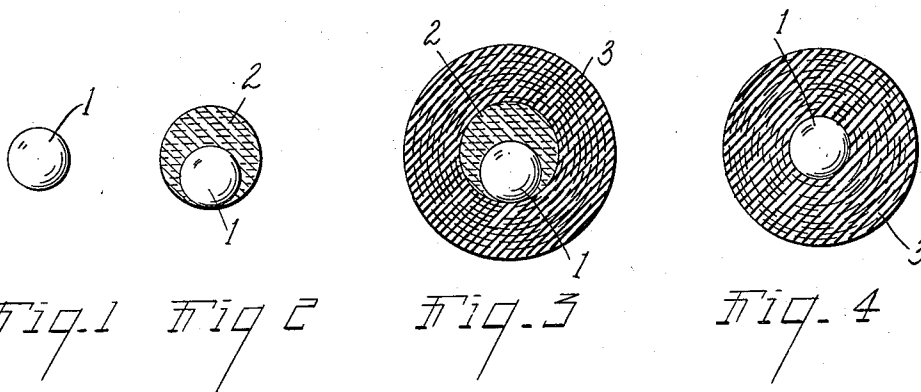
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GOLF BALL AND METHOD OF MAKING THE SAME

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GOLF BALL AND METHOD OF MAKING
THE SAME

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17 Claims. (Cl. 154—19)

This invention relates to improvements in golf balls and method of making the same.

The main objects of my invention are:

First, to provide an improved golf ball and a method of making the same whereby its characteristics of weight and hardness may be readily and accurately controlled.

Second, to provide a method whereby golf balls and like playing balls may be provided with suitable weights as well as a core of suitable size for the initial winding of rubber strands therearound and whereby assurance may be had that following the winding the weight will be accurately positioned at the exact center of the wound ball.

Third, to provide a solid center weighted golf ball or like playing ball, hence a ball not reliant upon the use of a weighted rubber strand, wherein the center weight is accurately positioned at the exact center of the ball.

Fourth, to provide a method of manufacturing golf balls whereby the winding thereof is greatly facilitated and expedited.

Further objects relating to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of my invention is illustrated in the accompanying drawing, wherein:

Figs. 1 to 6, inclusive, illustrate successive steps performed in the method of forming a golf ball or like playing ball in accordance with my invention, commencing with the spherical weighting pellet and ending with the finished product.

Fig. 7 is a fragmentary perspective view illustrating the manner in which the golf ball core is wound with rubber strands to build up the same.

The figures are exaggerated in the size of the parts, it being understood that a golf ball entirely conventional in its external measurements and weight is depicted.

The present invention relates to improvements in the method of making golf balls, comprising steps of winding a gasifiable or liquefiable core with rubber strands.

In the manufacture of golf balls, it is usually desirable to provide some weighting means whereby the resultant ball will have a predetermined weight in accordance with standards laid down by various golfing bodies. It has been proposed to utilize a solid pellet for this purpose and it has also been proposed to form a golf

ball in which such a pellet is omitted, in which case the center rubber strands are usually weighted by application thereto or embodiment therein of a suitable weighting agent. The present invention relies on the use of a solid weighting pellet, however the rubber strands are built up around this pellet in a novel and improved manner which greatly facilitates the winding process on conventional winding machinery and which results in the accurate positioning of the pellet at the exact center of the ball so that the same will be perfectly true in flight.

Referring to the drawing, reference numeral 1 indicates a suitable solid pellet, for example, a shot or lead pellet of a proper size and weight. In performing the method of my invention, I mold about or embed this pellet in a winding core of a solid though readily liquefiable or gasifiable substance, as, for example, solid carbon dioxide, ice, and the like. The pertinent characteristic of these substances, as well as others which may occur to those skilled in the art as being suitable for the purposes of my invention, is that they exist in fluid form at normal atmospheric temperature, but are congealable or otherwise rendered rigid at subnormal temperature or under other conditions. This winding core enclosing the pellet 1 is illustrated in Fig. 2 and is designated by the reference numeral 2. The molding step is performed in a suitable mold so that a spherical product results. It is impossible or highly impractical to center the pellet 1 in the core 2, however this is not necessary.

The core 2 is of a size which is well suited for winding by known winding machines, and in such machine the core is next wound to a suitable thickness with rubber strand material 3, as illustrated in Fig. 3. The core is readily positioned in the winding machine and the winding operation is performed with great uniformity due to the use of a winding core of substantial size, with the result that a perfectly spherical wound core results.

Following the aforesaid initial winding, the article is set aside for a predetermined interval to allow the material of the winding core 2 to gasify or liquefy and escape through the interstices of the winding 3. During this process, it will be apparent that the pellet 1, though it may be initially eccentrically disposed in core 2, is gradually shifted towards a position exactly concentric of the wound body 3, so that when the metamorphosis of the core 2 is complete, the

gas or liquid having escaped through the interstices as described, the solid weighting pellet 1 is accurately positioned centrally of the product.

It will be understood that by proportioning the size of the liquefiable or gasifiable winding core 2 and the tension of the winding the hardness of the ball may readily be determined, for as the material changes form the partially wound article shrinks somewhat in size (as illustrated in Figs. 3 and 4) and becomes less loosely tensioned. Thus, if a relatively soft ball were desired, the sphere of material 2 would be chosen relatively large, and vice versa if a relatively hard ball were desired. However, the desired result may be obtained by controlling the winding tension.

Following escape of the gas or liquid as described above, the article illustrated in Fig. 4 is provided with a final winding 4 of rubber strand which is applied under considerable tension, forming a layer of considerably denser nature than the windings 3. If desired, a still further winding 5 of fiber or cotton may be applied to the rubber strand wound article and the ball is finished by the application of a shell 6 of balata or like substance in accordance with known processes, for example, by molding.

The resultant product is one which has great accuracy in flight and the "feel" or responsiveness thereof can be determined as desired by proportioning of the size of the pellet 2 as well as by control of the winding tension. I have mentioned the use of ice or solid carbon dioxide (i. e., "dry ice") for the winding core 2, however it will be apparent to those skilled in the art that other condensed or solidified liquefiable, gasifiable, or volatile substances capable of diffusing through the strands 3 may be employed.

I have illustrated and described my improvements in an embodiment which is very practical. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of making golf balls and like playing balls comprising molding and congealing a material which exists in fluid form at normal temperatures about a solid spherical weighting pellet to form a rigid spherical winding core, winding rubber strands under tension to a predetermined thickness about said core, centering the pellet relative to said wound strands by causing said core material to become fluid and to escape through the interstices of said winding whereby said weighting pellet is automatically centered with reference to said winding and said winding with the weighting pellet centered therein occupies the space originally occupied by the material of the core, finally winding said initially wound article, and covering the finally wound ball.

2. The method of making golf balls and like playing balls, comprising molding and congealing a material which exists in fluid form at normal temperatures about a solid spherical weighting pellet to form a rigid spherical winding core, winding rubber strands under tension to a predetermined thickness about said core, and centering the pellet relative to said wound strands by causing said core material to become fluid and to escape through the interstices of said winding whereby said weighting pellet is automatically

centered with reference to said winding and said winding with the weighting pellet centered therein occupies the space originally occupied by the material of the core.

3. The method of making golf balls and like playing balls, comprising molding and congealing a material which exists in fluid form at normal temperatures about a solid spherical weighting pellet to form a relatively rigid winding core, covering said core with a resilient fluid-permeable layer, centering the pellet relative to said layer by causing said material to become fluid and escape through said layer whereby the pellet is automatically centered with reference to said layer and said layer fills the remaining space previously occupied by the winding core material, and covering the thus prepared article.

4. The method of making golf balls and like playing balls, comprising molding and congealing a gasifiable material about a solid weighting pellet to form a relatively rigid winding core, covering said core with a resilient fluid-permeable contractile layer, and centering the pellet relative to said layer by causing said winding core material to become fluid and escape through said layer whereby the pellet is automatically centered with reference to said layer and said layer fills the remaining space previously occupied by the winding core material.

5. The method of making golf balls and like playing balls, comprising molding and congealing a liquefiable material about a solid weighting pellet to form a relatively rigid winding core, covering said core with a resilient contractile fluid-permeable layer, and centering the pellet relative to said wound strands by causing said winding core material to become fluid and escape through said layer whereby the pellet is automatically centered with reference to said layer and said layer fills the remaining space previously occupied by the winding core material.

6. A method of manufacturing a golf ball or like playing ball having a weighting pellet therein, comprising encasing the pellet in a spherical core of solidified material which is capable of transformation from solid to fluid form, winding said spherical core with resilient strands under tension, transforming said material to fluid form to cause said material to escape through the interstices of said winding and the winding to engage and center the pellet, and finally winding and covering the resultant article.

7. A method of manufacturing a golf ball or like playing ball having a weighting pellet therein, comprising encasing the pellet in a spherical core of solidified material which is capable of transformation from solid to fluid form, covering said spherical core with resilient contractile fluid, permeable material, and transforming said solidified material to fluid form to cause said material in fluid form to escape through the covering material and the latter to engage and center the pellet.

8. A method of manufacturing a golf ball or like playing ball having a weighting pellet therein, comprising encasing the pellet in a solidified material which is capable of transformation from solid to fluid form, covering said material with a contractile fluid-permeable layer, and transforming said material to fluid form to cause said material in fluid form to permeate said layer and said layer to engage and center said pellet.

9. In the manufacture of cores for playing balls, the method which comprises initially winding elastic material under tension about a center composed of solid material which becomes

fluid at normal temperatures, and which has a spherical weighting pellet embedded therein, and causing the winding core to become fluid and escape to the exterior of the winding, the weighting pellet being automatically centered by the contraction of the strands as the winding core becomes fluid.

10. The method of forming golf balls, comprising forming and winding with resilient strands under substantial tension a spherical winding core of a material capable of transformation from solid to fluid form and having a spherical weighting pellet embedded therein, changing said material to fluid form to cause the material to escape through the strands and the strands to occupy the space formerly occupied by the winding core and to contract upon and center the weighting pellet, and winding the resultant product with further strands.

11. The method of forming golf balls, comprising winding resilient strands under substantial tension directly on a relatively rigid solidified winding core of material capable of transformation from solid to fluid form and having a weighting element embedded therein, and changing said material to fluid form to cause the material in fluid form to seep through the strands to thereby produce a spherical body made up entirely of the wound resilient strands and the weighting element centered within such strands.

12. A golf or like playing ball comprising a center having a solid spherical weighting pellet surrounded by and accurately centered in relatively loosely wound elastic strand material the tension of which is reduced substantially beneath the winding tension thereof by contraction about the pellet following escape of fluidifiable material in which the pellet is initially em-

bedded and on which the strand material is initially wound through the interstices of the strand material, the looseness of the strands being therefore governable by controlling the amount of said embedding material, and further resilient strand material tightly wound on said loosened center.

13. A golf or like playing ball comprising a center having a solid spherical weighting pellet surrounded by and accurately centered in relatively loosely wound elastic strand material the tension of which is reduced substantially beneath the winding tension thereof by contraction about the pellet following escape of fluidifiable material in which the pellet is initially embedded and on which the strand material is initially wound, and further covering material on said loosened center.

14. A golf ball center comprising a permanent solid spherical weighting pellet, and a layer of elastic strand material wound around said pellet under substantial initial tension but in finished condition under substantially less tension than the initial winding tension, said reduction in tension being the result of causing a temporary solid fluidifiable material in which the pellet is embedded during the winding operation to become fluid and escape through the interstices of the strands, the pellet being thereby accurately centered with reference to said strand material.

15. A golf ball produced in accordance with the method of claim 2.

16. A golf ball produced in accordance with the method of claim 4.

17. A golf ball produced in accordance with the method of claim 8.

LEONARD A. YOUNG.