Dec. 17, 1940. J. R. GAMMETER 2,225,213

GOLF BALL

Filed Jan. 27, 1939

FIG. 1

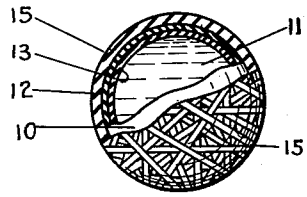


FIG. 2

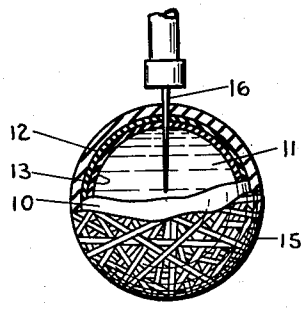


FIG. 3

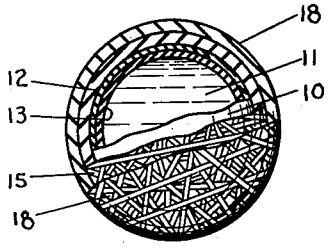
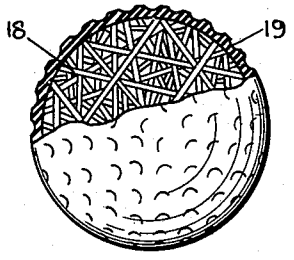


FIG. 4



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GOLF BALL

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1 Claim. (Cl. 273—62)

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

Heretofore, golf balls have been made, for example, by winding vulcanized thread-rubber on a suitable core, normally a liquid core encased in rubber, to form the ball-center, and then vulcanizing the usual rubber cover about the center. To obtain increased flight when the ball is struck by a club-head, it has been the general practice to wind band or thread-rubber on the core under high tension. As described in the patent to Gammeter, Number 1,167,396, the thread-rubber has been wound on the core under what has been termed "super-tension," to obtain even greater increased flight. This super-tensioned ball-center is obtained for example, by, winding the thread-rubber on the core while stretched nearly to its elastic limit, and allowing the rubber to stand for a number of hours, after which time the rubber in the ball-center becomes somewhat relaxed and may be further stretched beyond the original elastic limit, as by increasing the internal pressure in the liquid core by known methods.

However, it has been found that as the tension is increased adjacent the surface of the ball-center the tension on the cover also is increased so that the cover tends more readily to split or gash open under the impact of a club-head as when the ball is "topped." Furthermore, the thread-rubber being stretched thin provides fewer interstices on the surface of the ball-center into which the material of the outer cover can flow during vulcanization to become bonded to the ball-center, and the cover of the finished ball has a greater tendency to separate from its center.

An object of the invention is to provide an improved, more durable golf ball.

Another object of the invention is to provide a golf ball which will give maximum flight upon impact with a club-head.

Another object of the invention is to provide a golf ball in which the tendency of the cover thereof to split under impact with a club-head is materially minimized.

Another object of the invention is to provide an improved golf ball in which the outer cover is thoroughly bonded to the ball-center.

These and other objects will be manifest from the following brief description and the accompanying drawing.

Of the accompanying drawing:

Figure 1 is a view, partly broken away and in section, of a golf ball center in one stage of forming the same in accordance with the process embodying the invention.

Figure 2 is a similar view showing another stage in the process.

Figure 3 is a similar view showing still another stage in the process.

Figure 4 is a view, partly broken away and in section, showing a finished golf ball made in accordance with the invention.

Referring to Figure 1 of the drawing 10 may be any suitable ball core, but for the present purpose preferably comprises a normally mobile fluid 11, such as water, honey, glue, paste, etc., the fluid being retained in an outer spherical casing 12, of compounded vulcanized rubber, which may be lined with a self-sealing layer 13 of uncompounded rubber. Thread-rubber or rubber tape 15, stretched substantially to the elastic limit is wound on the core 10. The degree of tension can be adjusted, however, so as to minimize breakage of the thread. When the thread-rubber has been wound up to about half or five-eighths of the finished thickness of the wound portion of the ball, the partially wound center is allowed to stand for a number of hours. It has been found that by doing this for about ten hours, for example, the wound rubber relaxes considerably so that it may afterwards be further stretched a considerable amount. This has often been referred to as "supertensioning."

This super-tensioning may be obtained, as best shown in Figure 2, by inserting a hypodermic-needle 16, attached to suitable apparatus of known type (not shown), to project into the liquid 11 in core 10, and injection of more fluid under pressure to expand the core, and thereby further to stretch the thread-rubber 15 substantially to its elastic limit. The super-tensioning process may be repeated if desirable or necessary, but according to the present invention this super-tensioning is done on a partly wound ball.

With the inner portion of the ball thus under super-tension, thread-rubber is now wound on the partially wound center under ordinary tension to form an outer layer 18, (see Figure 3) after which a cover 19 of balata, gutta-percha, rubber or the like may be formed about the completed center in the usual manner to form the finished golf ball, illustrated in Figure 4.

It is a well known principle that the flight of a golf ball is caused by distortion of the ball upon impact with a club head, and by the ability of the ball to return to normal spherical shape while still in contact with the face of the club. For that reason the wound center should be as hard as possible to produce maximum resiliency and resistivity. However, as before stated, if the center

is too hard at the outer regions thereof, there will be less distortion under impact and the cover will be under such tension as to be readily gashed or split by the internal pressure of the center particularly when the ball is "topped."

Golf balls made in accordance with the present invention, because the tensioning of the thread-rubber in the ball-center is graduated, so as to be more deformable, elastic or resilient near the cover, possess the quality of producing long flight upon impact with a club head, but because the outer regions of the core are substantially not under internal pressure, the cover 19 is not under such tension that it will readily gash or split when hit by a club head. In addition, the outer layer of the less-tight winding 18 more effectively bonds with the cover when the cover is formed about the ball.

Modifications of the invention may be resorted to without departing from the spirit thereof or the scope of the appended claim.

What is claimed is:

A golf ball, comprising a hollow core containing a mobile or liquid substance under high pressure, a layer of thread-rubber windings adjacent said core, the windings in said layer being under high tension, a layer of thread-rubber windings about said first-named windings, the windings in said last-named layer being stretched to a substantially lesser degree, and a cover applied on the ball center comprising said core and windings, said cover being bonded directly to said last-named layer of windings and being under relatively low tension about said ball center.

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