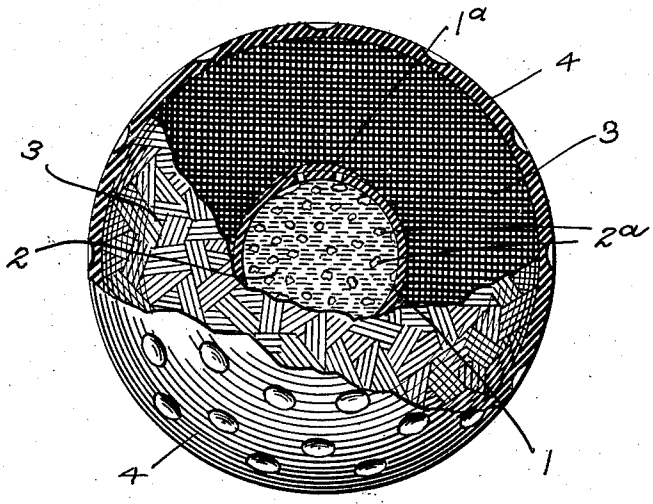
March 23, 1937. C. H. RICKEY 2,074,808

GAMEBALL

Filed Feb. 9, 1935



Inventor
Clarence H. Rickey
By Walker and Dybvig
Attorney

Patented Mar. 23, 1937 2,074,808

UNITED STATES PATENT OFFICE

2,074,808

GAME BALL

Clarence H. Rickey, Dayton, Ohio, assignor to The Crawford, McGregor and Canby Company, Dayton, Ohio, a corporation of Ohio

Application February 9, 1935, Serial No. 5,756

11 Claims. (Cl. 154—18)

This invention relates to game balls and the method of manufacture thereof and more particularly to a ball having an improved high tension core.

It has long been the practice to provide a body of liquid as the center or core for golf balls about which successive thread wrappings are disposed and the wound body enclosed in a rubber cover. Various liquids have been successfully employed for core purposes, including glue solution, a liquid lead solution, salt solution and, more recently, a body of honey. It is customary to solidify and contract such core by freezing while the body of the ball is being wound thereon. It is highly desirable that the windings be under relatively high tension. There is a limit to the tension to which the thread or yarn may be subjected while winding the ball without causing breakage.

By the present construction and method of manufacture, final tension or compression of the windings is materially increased without subjecting the thread to breaking strain during the winding operation. This is effected by introducing into the liquid core body a gaseous substance which by its evaporation and expansion under normal temperatures and playing conditions subjects the ball to internal pressure.

The object of the invention is to improve the construction of golf balls as well as the mode of manufacture thereof whereby they may not only be economically manufactured but will be more efficient and desirable in play and unlikely to be injured.

A further and highly important object of the invention is to provide a golf ball or the like having increased distance when struck, uniformity of click, and greater durability.

A further object of the invention is to provide a golf ball or the like of increased hardness, higher compression and greater resiliency.

A further object of the invention is to provide means for creating an internal expansive pressure within the ball.

A further object of the invention is to increase the inherent tension or compression of the ball without increasing the winding tension upon the thread or yarn to such degree as to endanger breakage during manufacture.

A further object of the invention is to provide means for taking up slack within the winding thereby causing the ball to be filled out into a uniform spherical shape.

A further object is to provide a golf ball which will be highly responsive, accurate in flight and affording maximum distance.

A further object of the invention is to provide a golf ball having the meritorious features and desirable characteristics herein mentioned.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims. The drawing is a sectional view of a golf ball embodying the present invention.

In the manufacture of golf balls at the present time the center core usually comprises a soft rubber spherical hollow envelope 1 filled with a suitable liquid 2. Such liquid may be any one of numerous substances, of which liquid glue, lead solution, salt solution and honey are examples. The hollow rubber ball or envelope 1 is filled with such liquid by use of a needle syringe introduced through the wall of the envelope. The envelope or rubber ball is also provided with a second small hole for venting the air as the liquid is introduced. These openings are then sealed by an adherent rubber patch, 1*a*. In the present instance the liquid introduced into the hollow or envelope 1 is augmented by introduction of a small amount of gaseous material, 2*a*, preferably in a condensed or solidified form. In practice, commercial "dry ice", that is solidified carbon dioxide, has been found quite practical and has been successfully used. However, other condensed or solidified volatile substances may be employed in lieu thereof. For balls of different manufacture and those constructed of different materials, different quantities of gaseous material may be used. It has been found that for golf balls of standard construction and of ordinary character, a quantity of solidified carbon dioxide the size of a pea is ample and sufficient to materially improve the resiliency and playing qualities of the ball. The gaseous substance being sealed within the ball permeates the liquid and expands, thereby increasing the tension.

The core body filled with a combined liquid and gaseous substance is frozen at a relatively low temperature to contract and solidify the core preparatory to winding. The filled cores are subjected to freezing temperatures as low as forty to sixty degrees below zero Fahrenheit, causing contraction of as much as one thirty-second of an inch or more. While in such solidified and contracted condition the winding 3 is applied. While it is quite desirable that the winding be under tension to produce a desirable hard ball, if too great winding tension be applied to the thread during the winding operation the thread may be broken. By the present method the winding is effected with as much tension as the winding thread can reasonably withstand and after the completion of the ball by the application of the cover 4, the subsequent expansion of the core liquid and the evaporation of the entrained gaseous material creates an increased internal

expansive pressure, thereby materially increasing the tension of the windings, and rendering the ball of harder character than can be effected by tensioned winding alone. The gaseous material, being quite mobile, equalizes the expansive tension and insures a spherical ball.

While the invention has been illustrated and described in its application to golf balls, it is to be understood that it may be applied to other types of game balls. It is recognized that heretofore it has been many times proposed that a body of compressed air or a body of gas be confined within a ball. However, such a gas or air filled cavity materially affected the weight and balance of the ball relative to its size and did not afford the necessary solidity and resistance to enable the desired response, nor afford the distance flight of the ball when struck.

The present intermixture of a liquid and gaseous filling for such game balls not only enables the standard ratio of weight and size to be maintained but it affords a certain yielding resistance to impact and effective reaction not afforded by an all gas or compressed air body and it likewise increases the liveliness and efficiency of the liquid filled balls, and augments the winding tension by creating increased internal pressure. The presence of the body of liquid enables the gas pressure of the associated relatively small body of gas to be more uniformly distributed over a larger area thereby insuring uniformity of tension and resiliency.

While in practice at the present time a small quantity of "dry ice" or carbon dioxide gas is commonly employed, it will be understood that not only may other gaseous substances, of a character which will be inert or non-detrimental to the core envelope I may be employed, but also the liquid filling of the core envelope may be of volatile character which will generate or give off an inherent gas at normal temperatures which will serve the purpose of the introduced gaseous substance intermixed with a non-volatile liquid before described. Hence it is not the desire nor intention to limit the invention to either the particular gaseous or liquid materials mentioned nor an intermixture thereof, but includes a volatile liquid which will automatically generate a gas while a considerable portion thereof remains liquid, thereby affording a combined liquid and gaseous core filling.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. As an article of manufacture, a golf ball having a liquid core permeated with a gaseous material by the expansion of which increased internal pressure is generated within the ball.

2. The herein described method of manufacturing golf balls including incorporating a quantity of liquid intermixed with carbon dioxide "dry ice" (CO_2) into the central core of the ball, wrapping a layer of strip material upon the core and permitting the "dry ice" content of the core to subsequently gasify, thereby internally increasing the tension of the wrapped layer of strip material.

3. A game ball having a central chamber, a portion of non-volatile liquid and a portion of initially solid volatile material contained within the central chamber and a layer of strand material wrapped thereabout.

4. A game ball including a chambered core, a body of liquid contained within the core chamber and means subjecting the liquid contents to fluid pressure additional to that of the surrounding portion of the ball.

5. A game ball including a chambered core, a body of liquid contained within the core chamber, and a gaseous substance incorporated in the body of liquid for subjecting the ball to internal expansive pressure additional to that imposed by the liquid contents thereof.

6. The herein described method of manufacturing golf balls including the steps of filling the core portion thereof with a liquid and incorporating therein a gas generating substance by the gaseous expansion of which the internal pressure of the liquid filling within the ball will be increased.

7. The herein described method of manufacturing game balls including the steps of filling the core portion thereof with a liquid and permeating said liquid with a gaseous substance to increase the internal pressure of the core portion of the ball.

8. The herein described method of manufacturing golf balls including the steps of filling the core portion thereof with a liquid and adding a portion of "dry ice" to the liquid contents of the core to increase the internal pressure of the said core portion.

9. The method of making golf balls which includes introducing a quantity of liquid into a core envelope, incorporating in the liquid filling of the core a portion of gas producing material in solid form, winding a covering layer of strip material upon the core containing the mixture of a liquid and gas producing material and subsequently permitting the gas producing material to gasify.

10. A golf ball including a body of liquid filling material contained in the core thereof and a portion of "dry ice" (CO_2) added to the liquid contents of the core to increase the internal pressure of the core portion and a layer of strand material wound upon the filled core.

11. The method of making a ball which includes introducing into a core envelope a quantity of liquid and introducing into such liquid a portion of carbon dioxide (CO_2, "dry ice") in solid form, and permitting gasification of the carbon dioxide content of the core to create an increased internal pressure by which the wound layer is internally expanded.

CLARENCE H. RICKEY.