INFLATED CONTAINER FOR BALLS

BACKGROUND

Tennis balls are manufactured to close specifications in order to have a uniform product for use anywhere in the world. The 1959 Revision of the Official Code of Rules for the International Lawn Tennis Federation, of which group the United States Lawn Tennis Association is a member, has a rule for tennis ball specifications.

Under the rule, the ball must have a uniform rough felt outer surface and stitchless seams. The diameter of the ball must be between 2½ inches and 2⅝ inches and the weight must be between 2 ounces and 2 1/16 ounces. The ball must also have a bound between 53 inches and 58 inches when dropped on a concrete surface from 100 inches height. In addition, when a force of 18 pounds is applied to opposite sides of a ball, the deformation must be between 0.265 inches and 0.290 inches.

The importance of having tennis balls with uniform physical characteristics must not be minimized. Those who are serious tennis players, either the relatively few competitors in tournaments or the many more competitors in recreational play, appreciate the feel of striking a good ball with the racket. It is well known that old or defective balls just will not go where they are hit and that in trying to compensate for the deficiencies of an old ball, a player will often ruin a good stroke that has been developed with much practice. Some of the best players would rather not play than play with defective balls. In Davis Cup tournament play it is the practice to replace the balls between every five and seven games and in other tournaments it is the practice to replace the balls between every 9 and 11 games in order to be sure that the balls will have uniform physical characteristics.

In order to meet the specifications, the tennis balls are made with a relatively thin wall of elastomeric material, covered on the outside with a felt fuzz, and filled with gas or air under pressure. The balls are usually packaged, in groups of three, in a container having sufficient pressure to substantially equalize the pressure in the balls. This method of packaging maintains the physical characteristics of the balls until the container is opened. At this time the fresh balls begin to age in several ways. There is a gradual escape of internal gas through the thin wall at all times and the escape is often accelerated when the ball is hit with a racket. There is also a gradual enlargement or deformation of the balls due to the internal pressure causing a gradual elongation of the thin wall.

In order to extend the useful life of tennis balls it is necessary to keep the balls under an external pressure when they are not being used. Different types of containers have been proposed for such use but I known of no container or other apparatus that has satisfactorily solved the problem, has been widely accepted, or is as simple in operation as the container of this invention.

SUMMARY OF THE INVENTION

The invention is for a new combination of parts for a pressuretight container having a pressuretight closure. The closure includes a simple manually operated means to pressurize the container. The container may be quickly opened or closed.

The invention makes it possible to place tennis balls under an equalizing pressure after each use and thereby avoid the ill effects of aging. Thus the useful life of the balls is greatly increased. AS a result of this invention it is possible for the average player, who may not stroke the cover smooth in a few sets, to play for a full season or more with balls that will always meet the specifications.

THE DRAWINGS

The invention may be more easily understood by reference to the drawings in which:

FIG. 1 is a side elevational view of one embodiment of the present invention with a dash line indication of the location of three tennis balls therein;

FIG. 2 is a sectional, partly in elevation, view taken on line 2–2 of FIG. 1;

FIG. 3 is a top view of a valve disc assembly used in the container of FIG. 1;

FIG. 4 is a fragmentary elevational view of an alternate construction of the container of FIG. 1; and

FIG. 5 is a sectional view of an alternate construction in which several containers are placed in a larger pressuretight can.

FIGS. 1 to 3 of the drawing show a container comprising a can assembly A, a closure and pump assembly B, and a handle and clamp assembly C.

Can assembly A includes an elongated cylinder 10 open at one end. Cylinder 10 may be made of thin light weight metal or may be formed or molded of other suitable rigid material. Around the open end of cylinder 10 is a smooth sealing edge 11. Extending across and fastened to the bottom of cylinder 10 is foot 12. Also connected to cylinder 10, in the preferred form, is a frame assembly including ring 13 and strap 14. The upper ends of strap 14 are turned to form pins 15.

Closure and pump assembly B includes a generally hemispherical cap 16 of elastomeric material. Cap 16 has an air hole 17 in the central portion and an annular rib 18 extending outwardly from the edge portion. Enclosing the annular rib 18 is ring 19 that may be formed with internal lip 28. Two extensions 20 are connected to ring 19. Just below rib 18 plate 21 is positioned with its circumference also enclosed by ring 19. Plate 21, in the preferred form, is of light weight metal. Inlet hole 22 is at the center of plate 21. It is desirable to have the rib 18, plate 21, and disc 25 of the closure assembly cemented together near the edges and also to have the outer surfaces cemented to ring 19.

If desired, plate 21 may be made of any suitable rigid material and have a small annular rib extending downward around hole 22 to form a valve seat. Disc 25 is of elastomeric material and has its circumference enclosed by ring 19. Spaced around the central portion of disc 25 are cuts 26 through the disc so as to reduce the stiffness of the disc and also to provide air passageways into the can. If desired, holes, not shown, may be used in place of cuts 26. Fastened to the upper surface of disc 25 is valve 27.

Handle and clamp assembly C connects closure and pump assembly B to container assembly A. While other suitable means may be used to create and maintain sealing surface 29 of disc 25 in airtight engagement with edge 11 of can 10, I have found the disclosed handle and clamp assembly to be quite satisfactory. Similar links 30 are connected to extensions 20 of ring 19 and to handle 31. Handle 31 is formed to connect pins 15 to links 30 to move closure and pump assembly B into airtight engagement with can 10 and to maintain the sealed position by the overcenter self-locking arrangement of the parts. The airtight seal is broken and the closure assembly is removable from the open end of can 10 by raising handle 31.

In operation, the balls are placed in the can and the can is sealed by closure and pump assembly B and the air pressure in the can is increased by pumping on cap 16. The air pressure in the can is increased by blocking air hole 17 while pushing on cap 16 to force air through inlet hole 22 past valve 27 and into the can. When the cap is released, valve 27 closes to prevent the escape of air from the can. At the same time more air is drawn into cap 16 through air hole 17 allowing cap 16 to return to the original form. The pumping action is repeated until it is difficult to press down on cap 16. Tests have shown the average adult will be able to increase the pressure in the can to about 12 pounds per square inch above atmospheric pressure. While any pressure increase in the can helps to keep the tennis balls fresh, an increase of about 12 pounds per square inch is very satisfactory.

If desired the ring 13 and strap 14 may be replaced by connecting band 32 to the can 10 as shown in FIG. 3.

By reference to FIG. 5 it will be understood that the benefits of this invention may be realized by placing more than one container, either with or without caps 16 thereon, in large can