

[54] **PRESSURIZED STORAGE CONTAINER**

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43 R, 81

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[57]

ABSTRACT

A container for holding contents under air pressure wherein the container basically comprises a body and a cap, a threaded connection being established between the cap and the body, upon initial location of the cap upon the body an air-tight seal is established therebetween, as the cap is tightened upon the body air pressure is caused to increase within the container.

7 Claims, 4 Drawing Figures

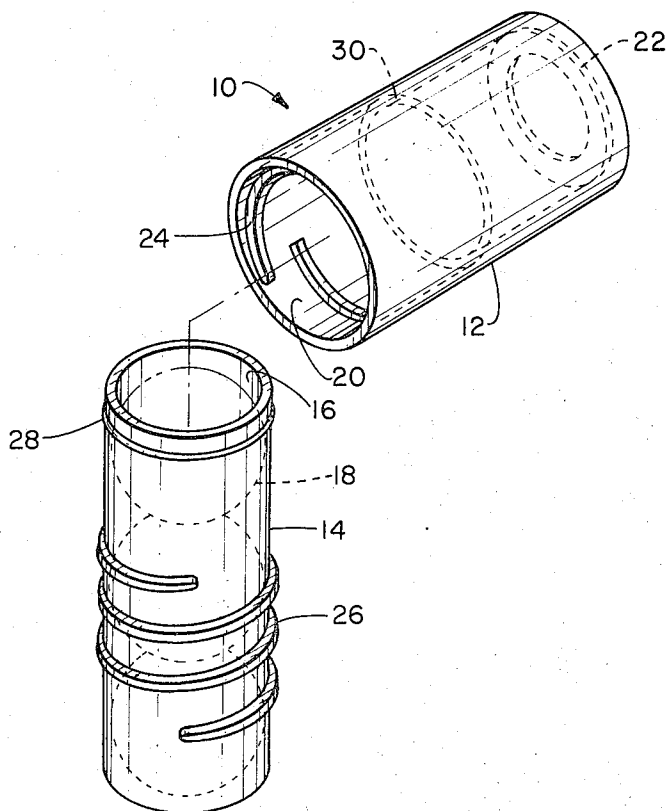


Fig. 1.

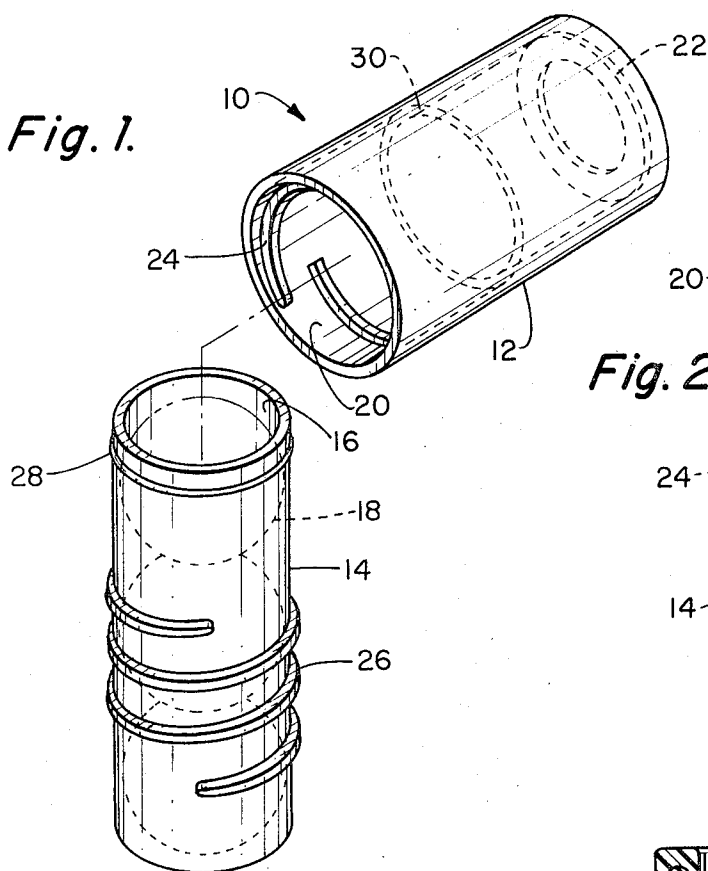


Fig. 2.

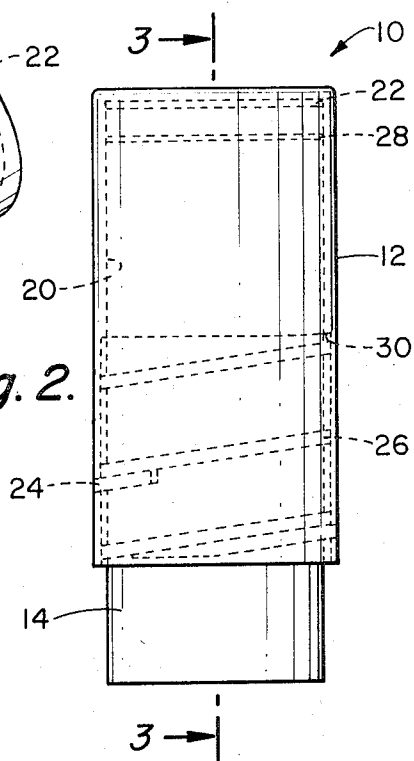


Fig. 3.

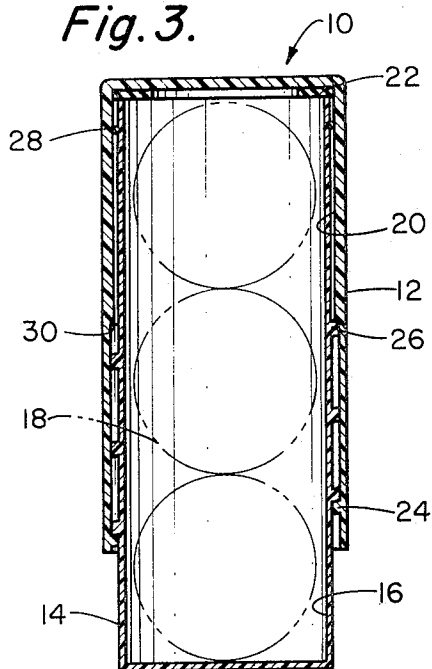
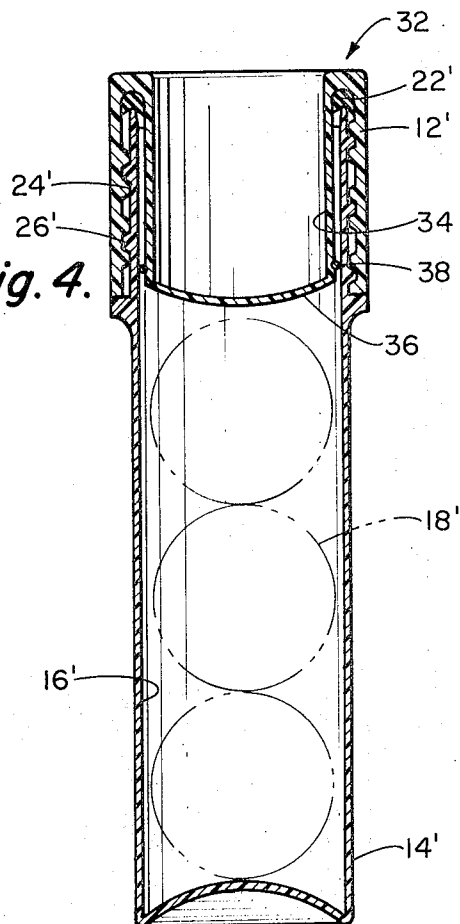


Fig. 4.



PRESSURIZED STORAGE CONTAINER

BACKGROUND OF THE INVENTION

Tennis balls are manufactured to close specifications in order to have a uniform product for use anywhere in the world. One of these specifications is that the ball must have a bounce between 53 inches and 58 inches when dropped on a concrete surface from 100 inches in height. In order to meet this specification and other specifications, tennis balls are made with a relatively thin wall of elastomeric material, covered on the outside with a felt fuzz, and filled with gas (such as 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 characteristic of the balls until the container is opened. At this time the fresh balls begin to age in a primary way, that being the gradual escape of internal gas through the thin wall of the ball at all times and also the acceleration of this escape when the ball is hit with a racket.

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 a racket. It is well known that old defective balls will not go where they are hit and that in trying to compensate for the deficiencies in 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 at all rather than play with defective balls.

Once the tennis ball pressurized container which is in common use has been opened, the balls which are not being used and are located in that container begin their deterioration. Also, once a ball has been used, it would be desirable to relocate the used ball in a pressurized atmosphere in order to decrease the ball's deterioration.

In the past there have been several types of containers which have been proposed for such use. However, such previously known containers are complex in construction and therefore costly to manufacture and also require to be connected with a source of pressurized gas once the container is reclosed. As a result, such containers have not achieved any significant commercial success and as of the present day, no repressurizing type of container is known to be employed.

The pressurization which is required in the containers in which the balls are sold is approximately 13 pounds per square inch. This pressure is not so significantly high as to require a separate pressurizing apparatus to be connected with the container to repressurize the container. It is one object of this invention to employ the use of a pressurizing means incorporated with the container which can be readily applied manually.

SUMMARY OF THE INVENTION

The container of this invention provides for a body portion and a cap portion. Once the cap portion is initially inserted upon the body portion, an air-tight seal therebetween is established, closing off the interior of the body portion of the container to the ambient. Means are provided between the cap and the body portion such as a threading arrangement which permits the cap to be tightened upon the body. As a result, the volume of the space within the body portion of the container is decreased. This decreasing of the volume causes a compression of the gas, which is normally air, within the body. The arrangement between the cap and the body is such so that with the cap completely tightened upon the body, the pressurization of the gas within the body will be approximately 13 pounds per square inch. Therefore, the tennis balls which are to be located within the container will again be placed within a pressurized environment.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an isometric view of the container of this invention showing the cap disassociated from the body;

FIG. 2 is a side view of the container of this invention showing the cap completely closed about the body;

FIG. 3 is a cross-sectional view of the container of this invention taken along line 3—3 of FIG. 2; and

FIG. 4 is a cross-sectional view of a modified form of the container of this invention similar to that of FIG. 3.

DETAILED DESCRIPTION OF THE SHOWN EMBODIMENT

Referring particularly to the drawing, there is shown in FIG. 1 the container 10 of this invention which is basically composed of a cap 12 and a body 14. The body 14 includes an interior chamber 16 which is adapted to receive a plurality (normally three in number) of tennis balls 18. However, it is to be understood that although this invention is described in preference to the use of tennis balls, it is considered that the apparatus of this invention may be employed for other types of game balls or to pressurize other types of contents.

The cap 12 also includes an interior chamber 20. Mounted within the cap 12 adjacent the closed end of the chamber 20 is a seal 22. The seal 22 would normally comprise a resilient non-metallic material such as rubber, plastic or the like. The purpose of the seal 22 is to insure that an air-tight connection is established between the cap 12 and the body 14 when the cap 12 is fully inserted upon the body 14.

Secured to the cap 12 within the chamber 20 is an internal thread 24. Fixedly mounted upon the body 14 is a thread 26. Also mounted a groove within the body 14 adjacent the opened end of the body 14 is an O-ring seal 28. The O-ring seal 28 is deemed to be a conventional type of seal and will also be formed of a resilient non-metallic material such as rubber or plastic.

The operation of the container 10 of this invention is as follows: It is presumed that the container has been received by a person desiring to use one or more of the balls 18 and the container has yet to be opened. Initially the container is pressurized to approximately thirteen pounds per square inch. The person then grasps both the body 14 and the cap 12 and causes a turning movement to occur therebetween by the application of manual force. This causes the thread 24 to be moved along the thread 26 until the cap 12 can be disassociated from the body 14. It is to be noted that the depressurization of the chamber 16 is accomplished gradually and no ejecting of the cap 12 is caused. Once the cap 12 has been removed from the body 14, the ball 18 which is stored within the chamber 20 can be readily removed.

Let it be assumed that only a single ball 18 has been removed from the chamber 20. The operator then relocates the cap 12 upon the body portion 14 so that thread 24 becomes coupled with the thread 26. In this position an air-tight seal is established between the O-ring 28 and the smaller diameter section 30 of the cap 12. It is to be noted that the diameter of the thread 24 is equal to or greater than the diameter of the section 30 in order to permit passage of the O-ring 28 past the thread 24. With the air-tight connection being initially established between the cap 12 and the body 14, as the cap 12 is rotated about the body 14, a recompression occurs within the chamber 16 caused by a compressing of the gas within the chamber 16. The longitudinal movement of the cap 12 upon the body 14 is preselected so that the compression of the gas within the chamber 16 is to the value of approximately 13 pounds per square inch with three balls located in the chamber 16. Therefore, the balls which are not in use in being retained within the chamber 16 are not caused to deteriorate but are stored in a satisfactory pressurized environment.

It is to be understood that with one or two balls removed from chamber 16, a pressurization of less than the initial 13 psi would result. However, a partial pressurization is better than no pressurization.

At the time the operator decides to relocate the ball that is being used within the container 10, the container 10 is opened, the ball inserted in the container 10 and then closed. This causes a pressurization of the gas within chamber 16 and prevents the ball that was used from deteriorating as well as the unused balls.

Referring particularly to FIG. 4 of the drawings, like numerals have been employed to refer to like elements. The container 32 of FIG. 4 retains the balls 18' in a manner similar to the previous embodiment. However, the cap 12' is substantially interiorly recessed to form cylindrical extension 34. The cylindrical extension 34 is closed at its innermost end 36. Mounted exteriorly about the extension 34 within a groove is an O-ring seal 38. The seal 38 causes an air-tight connection to be established between the extension 34 and the body 14' by location of such within the chamber 16'. The cap 12' includes an interior thread 24' in a manner which was described in the previous embodiment. Also, the body 14' includes an exterior thread 26'. As the cap 12' is rotated about the body 14' with the threads 24' and 26' being coupled, a compressing of the gas within the chamber 16' is caused, resulting in a pressurizing of the balls 18'.

It is considered to be within the scope of this invention that other modified forms of containers can be employed without departing from the scope of this invention. For example, a single thread 24 and 26 is employed upon each container. However, a double thread could be readily employed, it only being that a single thread is desirable for purposes of reduced friction. Also, it is considered to be within the scope of this application to make other changes in structure without departing from the concept of the pressurized container having a gradual build-up of pressure therein and a gradual release of pressure when the cap is removed. Another modification would be the employment of the O-ring adjacent the threads in a groove within the smaller section 30 of the cap 12 in lieu of being employed at the end of the body 14.

What is claimed is:

1. A pressurized container comprising:
a body having an interior chamber to be pressurized;

a rigid cap for compressing air in said interior chamber, said cap being longitudinally and bodily movable relative to said body from an initial position to a completely closed position;

first means located between said cap and said body to establish an air-tight connection therebetween, said first means causes establishment of said air-tight connection when said cap and body are in said initial position and maintains said air tight connection during movement of said cap in either direction between said completely closed position and said initial position, thereby resulting in gradual change in pressure in said interior chamber as said cap moves in either direction between said positions; and

second means mounted on both said cap and said body, said second means capable of interlocking to effect movement from said initial position to said completely closed position and to result in securement of said cap upon said body in said completely closed position.

2. The container as defined in claim 1 wherein:
said cap having a second interior chamber;
said body being insertable within said second interior chamber, said first means being located between the wall of said second interior chamber and said body.

3. The container as defined in claim 1 wherein:
both said body and cap being cylindrical in configuration;
said second means comprises a threaded arrangement including a first thread mounted upon said cap and a second thread mounted upon said body.

4. The container as defined within claim 2 wherein:
said first thread is on the interior surface of said cap and said second thread is on the exterior surface of said body, said threads becoming coupled at said initial position and remaining coupled during movement of said cap to said completely closed position.

5. The container as defined in claim 4 wherein:
said first means comprises an O-ring seal which is formed of a resilient material, said seal being located between said second means and said interior chamber for all positions of said cap between said initial position and said completely closed position.

6. The container as defined in claim 1 wherein:
said first means comprises an O-ring seal which is formed of a resilient material, said seal being located between said second means and said interior chamber for all positions of said cap between said initial position and said completely closed position.

7. The container as defined in claim 1 wherein:
said cap including an extension, said extension being adapted to matingly cooperate within said interior chamber of said body, said first means being located between said extension and said body.

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