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(54) **TENNIS BALL PICK-UP AND STORAGE DEVICE**

Publication Classification

(76) Inventor: **Gene Niksich, Alpharetta, GA (US)**

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(57) **ABSTRACT**

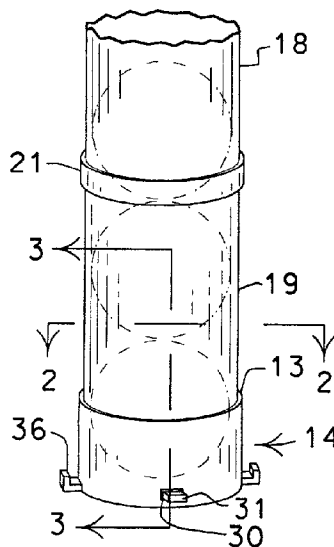
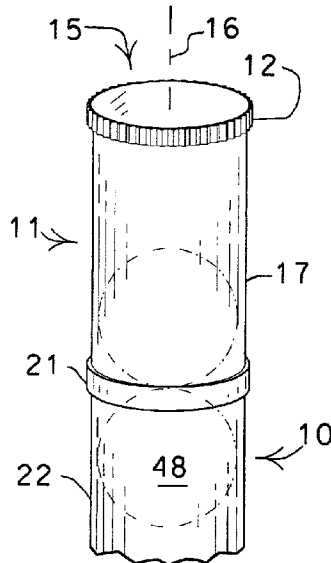
A device for picking up, storing and controllably releasing tennis balls includes a straight hollow tube of adjustable length extending between an upper end equipped with a closure feature, and a lower end having a flexible sphincter mechanism. The closure feature is slideably adjustable to positions which either seal the tube or permit removal of balls. The sphincter mechanism includes a circular array of protrusions interiorly directed toward the center axis of the tube.

Correspondence Address:

Norman B. Rainer
2008 Fondulac Road
Richmond, VA 23229 (US)

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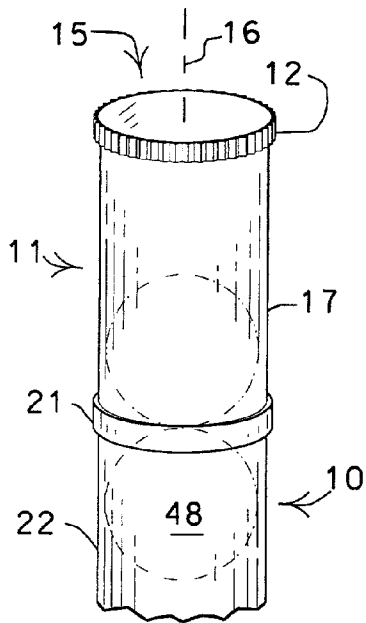


FIG. 1

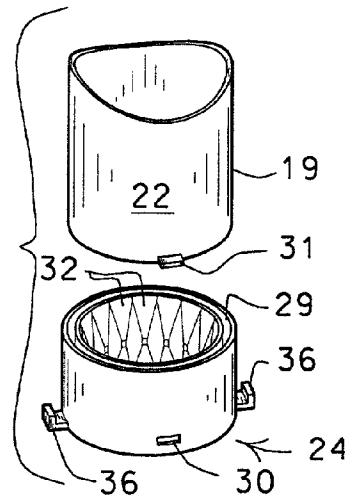
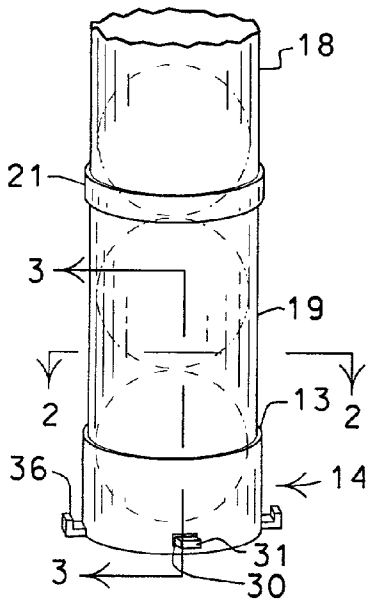


FIG. 4

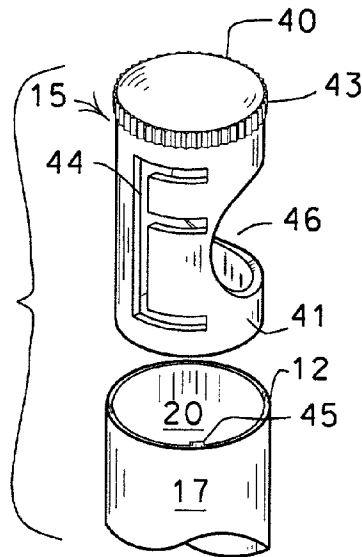


FIG. 5

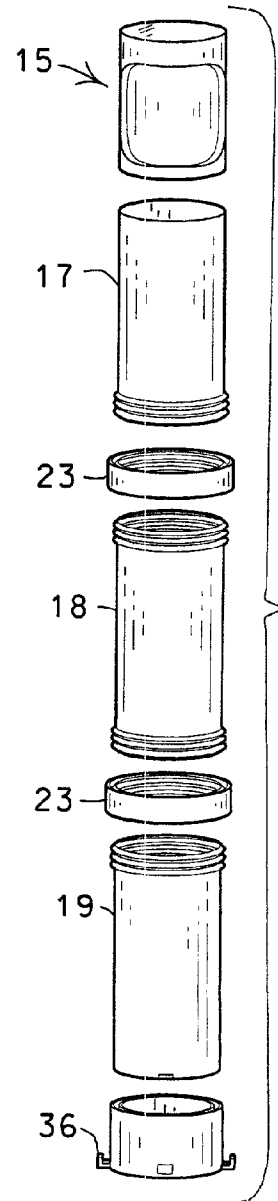


FIG. 6

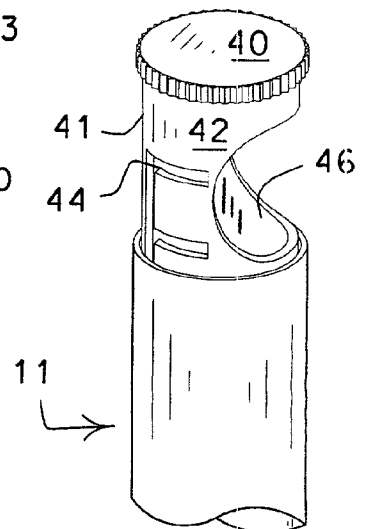
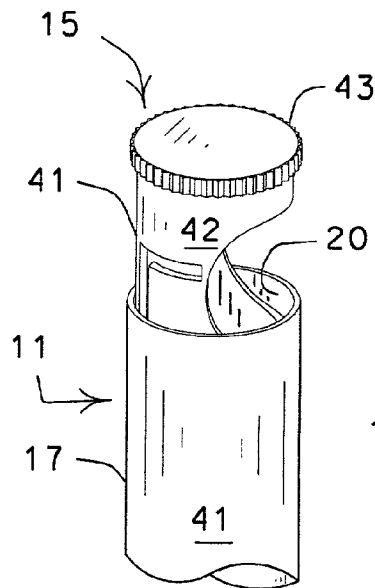
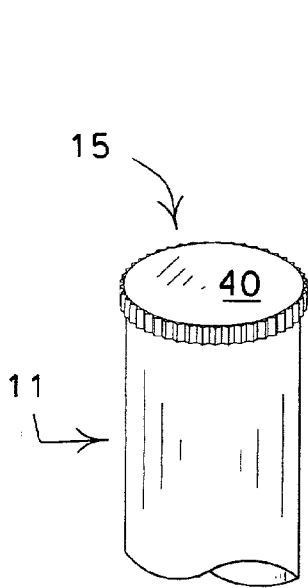
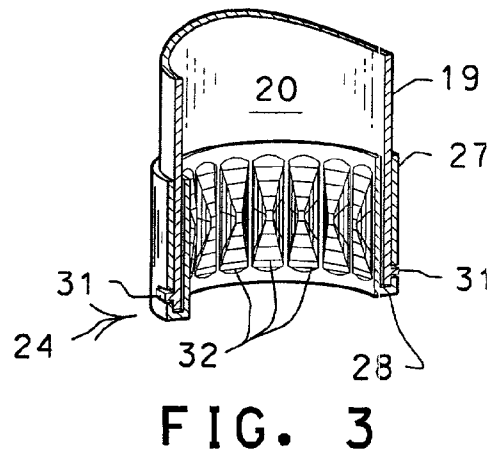
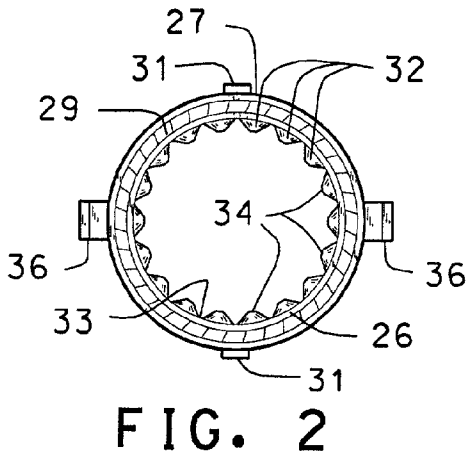


FIG. 7A

FIG. 7B

FIG. 7C

TENNIS BALL PICK-UP AND STORAGE DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention concerns a device for picking up tennis balls and storing a number of the balls in an easily dispensable manner, and more particularly relates to a tennis ball pick-up device of compact construction for convenient use, storage and transport by a tennis player.

[0003] 2. Description of the Prior Art

[0004] In the course of a typical tennis practice session, many tennis balls will come to rest on the tennis court. Once a session is complete or all the balls are used, they must be picked up in order to start another practice round. This is done not only for the safety of the players, but also to keep the court free of tennis balls for the next session of play. In order to retrieve the tennis balls from the court, the player has to pick up each individual tennis ball by hand. This usually means that, without the aid of any helping device, the player must squat or bend over each time a ball is picked up.

[0005] In addition to squatting or bending over to pick up each individual ball, the player has to then walk to a specific location where the balls are being stored, e.g., a tennis bin, for storage and future retrieval of the balls during the ensuing session. This takes many trips across the court, since the player can only hold a limited amount of tennis balls at one time. This process is very time consuming, and frustrating to the player.

[0006] Tennis ball pick-up devices have been disclosed which enable the player to retrieve balls without having to bend over, and which store a multitude of balls in an easily dispensable manner. One such device, disclosed in U.S. Pat. No. 5,755,632 to Eddy, comprises an elongated straight cylindrical tube capable of storing the balls in a stacked array. The interior lower extremity of Eddy's tube is equipped with a sphincter member having a resilient flange which permits upward passage of a tennis ball into the storage tube when said lower extremity is pressed downwardly onto a tennis ball. The stored balls can be poured from the upper extremity of the tube which is closable by a rubberband stretched diametrically across the otherwise open upper extremity. The storage tube of the Eddy device is of fixed length. The manner of attachment of the sphincter member to the tube is not clearly disclosed.

[0007] Although the Eddy device properly addresses the needs of tennis players, improvement is desired in several features. In particular, adjustability of the tube length is desirable to facilitate storage and versatility of use. A controllable ball release mechanism is desirable, and improvement is desirable in the durability of the sphincter feature and its mode of attachment to the tube.

[0008] It is accordingly an object of the present invention to provide a conveniently carried device that enables a tennis player to pick up tennis balls without bending over.

[0009] It is another object of this invention to provide a tennis ball pick-up device that stores a multitude of balls, and can controllably discharge said balls.

[0010] It is a further object of the present invention to provide a ball pick-up device of the aforesaid nature whose

size may be diminished for use by children or enlarged to provide greater ball-storing capacity.

[0011] It is yet another object of this invention to provide a ball pick-up device of the aforesaid nature capable of being collapsed or dismantled to a small size to facilitate packaging, shipping and storage.

[0012] It is a still further object of the present invention to provide a ball pick-up device of the aforesaid nature of durable, simple construction amenable to low cost manufacture.

[0013] These objects and other objects and advantages of the invention will be apparent from the following description.

SUMMARY OF THE INVENTION

[0014] The above and other beneficial objects and advantages are accomplished in accordance with the present invention by a tennis ball pick-up device for picking up, storing and controllably dispensing tennis balls, comprising:

[0015] a) hollow tube means of adjustable length elongated upon a straight center axis between upper and lower ends and having a circular cylindrical interior surface whose diameter is slightly larger than the diameter of a tennis ball,

[0016] b) flexible sphincter means attached to said lower end and having a circular array of identical protrusions effectively disposed upon said interior surface and directed toward said axis and terminating in apices disposed in a circular locus orthogonal to said axis and whose diameter is slightly smaller than the diameter of a tennis ball, and

[0017] c) closure means removably associated with said upper end and adjustable by sliding contact with said interior surface in axial and rotative directions to provide conditions of: 1) sealed storage of balls confined within said tube means, 2) controlled removability of one ball at a time, and 3) poured emergence of all stored balls.

BRIEF DESCRIPTION OF THE DRAWING

[0018] For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawing:

[0019] FIG. 1 is a front perspective view of an embodiment of the ball pick-up device of the present invention.

[0020] FIG. 2 is an enlarged sectional view taken in the direction of the arrows upon the line 2-2 of FIG. 1.

[0021] FIG. 3 is an enlarged sectional view taken in the direction of the arrows upon the line 3-3 of FIG. 1.

[0022] FIG. 4 is an exploded fragmentary perspective view of the lowermost portion of the embodiment of FIG. 1.

[0023] FIG. 5 is an exploded fragmentary perspective view of the uppermost portion of the embodiment of FIG. 1.

[0024] FIG. 6 is an exploded front perspective view of an alternative embodiment of the ball pick-up device of this invention.

[0025] FIGS. 7A, 7B and 7C are views similar to FIG. 5 showing three different states of the device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0026] Referring now to FIGS. 1-5, an embodiment of the ball pick-up device 10 of the present invention is shown comprised of hollow tube means 11 extending between upper and lower ends 12 and 13, respectively, sphincter means 14 associated with said lower end, and closure means 15 associated with said upper end.

[0027] Tube means 11 is of adjustable length and elongated upon straight center axis 16 between said upper and lower ends. In the embodiment illustrated in FIG. 1, the adjustability of length is achieved by way of telescopically interactive top, middle and bottom hollow tubes 17, 18 and 19, respectively, each having a circular cylindrical interior surface 20. In order to achieve proper functionality, it has been found that the diameters of the interior surfaces of said top, middle and bottom tubes should be 78 mm., 75 mm. and 72 mm., respectively. Such arrangement of tubes causes the inside diameter of tube means 11 to be upwardly divergent. Collars 21, disposed upon the exterior surfaces 22 of said interactive tubes achieve frictional securement of the tubes in their telescopically extended state, as shown in FIG. 1. In the collapsed, storage state of tube means 11, the effective length of said tube means will be substantially one-third the length of the extended state. The lengths of said hollow tubes may range from about 10 to 20 inches, whereby tube means 11, in its extended state, may hold up to 22 tennis balls.

[0028] In the alternative embodiment shown in FIG. 6, the separate hollow tubes that comprise tube means 11 are interconnected by threaded collars 23. In either embodiment, the tubes are of thin-walled lightweight construction, fabricated of aluminum or rigid thermoplastic material.

[0029] Sphincter means 14 is exemplified as a monolithic boot 24 molded of a flexible material such as natural or synthetic rubber, silicone, plasticized polyvinyl chloride or equivalent materials. The flexible material has a Shore A hardness preferably between 30 and 70. Boot 24 is shown having a ring-like configuration defined by annular interior and exterior cylindrical panels 26 and 27, respectively, and flat circular bottom surface 28. A trough 29 of U-shaped vertical sectional configuration is defined by said interior and exterior panels and is configured to receive lower end 13 of hollow tube means 11. At least two apertures 30 are disposed within exterior panel 27, preferably in diametric opposition. Apertures 30 are positioned and configured so as to be penetratively engaged by locking posts 31 outwardly emergent from the exterior surface 22 of bottom tube 19 adjacent lower end 13. Such manner of construction enables boot 24 to be easily and securely installed onto the lower end 13 of hollow tube means 11. Outwardly directed tabs 36 may be emergent from exterior panel 27 to facilitate the hanging of the device from a fence or other elevated structure.

[0030] A series of identical protrusions 32 is disposed in a circular array upon the inside surface 33 of interior panel 26. The exemplified protrusions are continuous integral exten-

sions of said interior panel, and are shown having a substantially pyramidal configuration, each terminating in an apex 34. Said apices 34 are disposed in a circular locus orthogonal to axis 16 and having a diameter slightly smaller than the diameter of a tennis ball. Said array of apices provides a sphincter effect whereby tennis balls can be forced past the array by downward force applied by the device upon a tennis ball. Once the ball has passed upwardly beyond the sphincter array, it will not fall back below the array. However, the retaining force of the sphincter array must be sufficiently strong to support the gravity force of as many as 22 tennis balls that may be stored within hollow tubes means 11.

[0031] When compared with the resilient flange feature of the aforesaid U.S. Pat. No. 5,755,632 to Eddy, the circular array of protrusions 32 provides a more durable and more reliable sphincter effect. One reason for the improved durability is that, when the device is stored for a long period of time fully loaded with balls, the weight of the balls will cause a distortion in the circularity of Eddy's flange, and such distortion will adversely effect functionality. Such distortion will not occur with the array of apices of the present invention, particularly because of the pyramidal contour of the protrusions 32 which facilitate a uniformly distributed force loading from the weight of the supported balls.

[0032] Closure means 15 is a cap-like structure bounded by upper panel 40 having knurled abutment lip 43, and cylindrical side wall panel 41 having an outer surface 42 adapted to slideably engage the interior surface 20 of top hollow tube 17. Said side wall panel has a ball-exiting portal 46. A groove pattern 44, having the shape of the capital letter E, is recessed into side wall panel 41. A bearing tab 45, incorporated into the interior surface 20 of top tube 17 adjacent upper end 12, is adapted to slideably track within groove pattern 44. By a combination of axial and rotative sliding movements facilitated by knurled lip 43, closure means 15 may be positioned at three distinct positions along axis 16, as shown in FIGS. 7A, 7B and 7C, which represent different functional states of the device.

[0033] In a first state, shown in FIG. 7A, the closure cap is in its downward-most position, wherein lip 43 is in abutment with upper end 12 of tube 17. In this storage state position, portal 46 is sealed, and the balls 48 cannot leave the device. In a second position, or single feed state, shown in FIG. 7B, the closure cap is raised to a position which causes minimal occlusion of portal 46. This enables the user to selectively remove one ball at a time when the device is in an upside down orientation. In a third position, or rapid removal state, shown in FIG. 7C, closure cap is in its furthest position of removal from tube 17. In this position, there is no occlusion of portal 46, and the contained balls are free to emerge from said hollow tube means by gravity effect when the device is inverted, causing said sphincter means to be upwardly directed.

[0034] While particular examples of the present invention have been shown and described, it is apparent that changes and modifications may be made therein without departing from the invention in its broadest aspects. The aim of the appended claims, therefore, is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

Having thus described my invention, what is claimed is:

1) A tennis ball pick-up device for picking up, storing and controllably dispensing tennis balls, comprising:

- a) hollow tube means of adjustable length elongated upon a straight center axis between upper and lower ends and having an interior surface of circular cross-sectional configuration whose diameter is slightly larger than the diameter of a tennis ball,
 - b) flexible sphincter means attached to said lower end and having a circular array of protrusions directed toward said axis and terminating in apices disposed in a circular locus orthogonal to said axis and centered thereupon and whose diameter is slightly smaller than the diameter of a tennis ball, and
 - c) closure means associated with said upper end and adjustable by sliding contact with said interior surface in axial and rotative directions to provide conditions of:
 - 1) sealed storage of balls confined within said tube means, 2) controlled removability of one ball at a time, and 3) poured emergence of all stored balls.
- 2) The device of claim 1 wherein said tube means is comprised of telescopically interactive top, middle and bottom hollow tubes, each having a circular cylindrical interior surface, said tubes permitting deployment between functional and storage states of said device.
- 3) The device of claim 2 wherein the diameters of the interior surfaces of said top, middle and bottom tubes diminish stepwise respectively, whereby the diameter of the interior surface of said tube means is step-wise upwardly divergent.
- 4) The device of claim 3 wherein the diameters of the interior surfaces of said top, middle and bottom tubes are 78 mm, 75 mm and 72 mm, respectively.

5) The device of claim 2 further comprised of collars which interactively secure said tubes.

6) The device of claim 2 wherein said tubes are of thin-walled construction having lengths between 10 and 20 inches.

7) The device of claim 1 wherein said tube means is comprised of at least two hollow tubes that are threadably interconnected.

8) The device of claim 1 wherein said sphincter means is a monolithic boot molded of a flexible material.

9) The device of claim 8 wherein said flexible material has a Shore A hardness between 30 and 70.

10) The device of claim 8 wherein said boot has a ring-like shape defined by annular interior and exterior cylindrical panels which define there between a trough of U-shaped vertical sectional configuration configured to receive the lower end of said tube means.

11) The device of claim 1 wherein said protrusions have a substantially pyramidal configuration.

12) The device of claim 1 wherein said closure means is a cap-like structure bounded by an upper panel and a cylindrical side wall panel.

13) The device of claim 12 wherein the side wall panel of said closure means has a ball-exiting portal and a recessed groove pattern.

14) The device of claim 13 wherein the interior surface of said tube means is provided with a bearing tab adjacent said upper end, said bearing tab being configured to slideably track within the groove pattern of said closure means.

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