A. A. GREEN.

BALL INFLATER AND SEALER.

APPLICATION FILED MAR. 31, 1914.

1,138,749. Patented May 11, 1915.

Fig. 1.

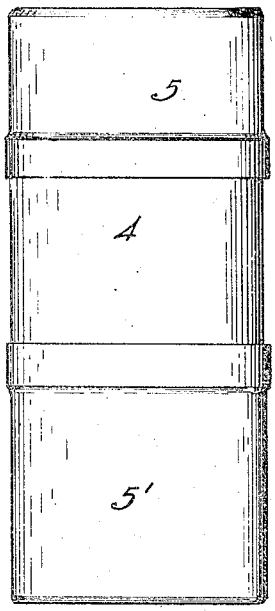


Fig. 2.

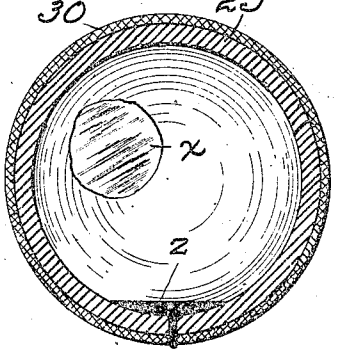


Fig. 3.

Fig. 4.

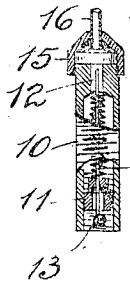


Fig. 5



Fig. 6.

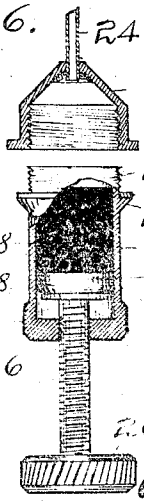


Fig. 7.

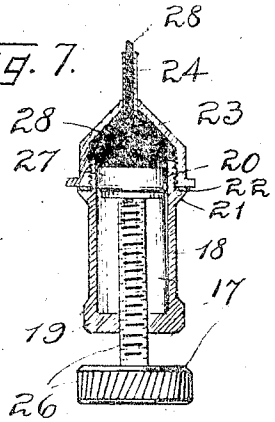
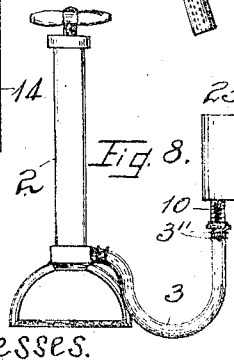


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

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BALL INFLATER AND SEALER.

1,138,749. Specification of Letters Patent. Patented May 11, 1915.

Application filed March 31, 1914. Serial No. 828,529.

To all whom it may concern:

Be it known that I, ALLEN AYRAULT GREEN, a citizen of the United States, and a resident of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Ball Inflater and Sealer, of which the following is a specification.

The invention relates to devices for inflating and sealing and thereby rejuvenating that class of balls used in playing tennis, rackets, hand-ball, etc.

The primary object of the invention is to provide novel means whereby a ball or other hollow object not provided with a valve may be inflated. This class of balls is, as a rule, not provided with an air hole or other opening. It is therefore necessary to puncture the ball before it can be inflated.

A further object of the invention is that the device include means whereby the puncture may be sealed.

A further object is to provide a new method of inflating and sealing and thereby renewing or restoring valveless balls and other hollow objects which have lost their air content and thereby their resiliency.

It is an object to provide a device of the nature described which is of such character that it may conveniently be carried about (even in the player's pocket) and used when and where desired.

The invention consists in novel means for and method of carrying out these objects.

In order that the nature of the invention may be fully comprehended I have appended hereto a sheet of drawings in which I have illustrated that form of device now preferred by me for carrying the invention into effect. This structure is shown, primarily because it has been found in practice to give excellent results; it is to be understood, however, that the several instrumentalities of which the invention consists may and can be variously constructed, organized and arranged, and that I do not contemplate the scope of the invention as limited to the particular structure shown and described but consider it as covering all such changes as fairly fall within the general idea thereof, considered in its broadest aspect.

In said drawings: Figure 1 is an elevation, showing a preferred form of case especially adapted for the containment of my improvements; Fig. 2, a transverse central section of a tennis ball, showing two seals or patches thereon; Fig. 3, an elevation, partly in section, illustrating a preferred embodiment of my invention and further illustrating its operation; Fig. 4, a longitudinal central section of the air-valve, partly in elevation. Fig. 5, a modified detail of one end of the discharge means; Fig. 6, a longitudinal central section of the seal-containing tube or injecter; Fig. 7, a view similar to Fig. 6, but the parts shown in different relative positions; and Fig. 8, an elevation, reduced and slightly modified, showing also a common type of air-pump as attached to the device.

Coming now to a detailed description of said drawings and designating each part by a distinguishing reference numeral, uniformly employed throughout the several views, 2 designates an air pump, 3, a hose suitably connected therewith, and 3′, connecting wires. These may be of any preferred construction and require no further description herein other than to state that any suitable source of air or gas supply is comprehended by me, for the purpose of my invention, as the equivalent of the pump shown.

4 designates the central member of a case, and 5, 5′ indicate caps slipped over the ends thereof.

6 designates a diaphragm suitably secured in what may be termed the front end of the case member 4, and 7 indicates a similar diaphragm similarly secured near its rear end.

8, 8 are nuts secured one on each face of the diaphragm 7, the apertures in all these corresponding.

9 indicates an air-valve, which may be of any ordinary construction. The one shown comprises a tube 10, check-valve or valve proper 11, valve-stem 12 having a head 13, valve-return spring 14, and cap 15. Sweated or otherwise secured in the apex of the cap 15 is an air-pipe 16. The exteriorly arranged threads on the tube 10 are engaged by those on the nuts 8, whereby the valve 9 is secured in position in the diaphragm 7.

17 designates a seal-containing tube or injector and comprises a cylindrical casing 18 having at one end an apertured head 19 and at its other end a threaded annular projection 20.

21 is an annular shoulder providing a seat

for a gasket 22. 23 designates a conical cap into the apex of which is sweated or otherwise secured a nozzle 24 the outer end portion of which lies parallel with the similar portion of the air-tub 16. The tube and nozzle are embraced by a tubular needle 25, and the ends of all three of these elements are beveled off as indicated best in Fig. 5, the end of the air tube preferably projecting slightly farther into the puncturing needle than does the end of the nozzle, for a purpose presently described. In this figure I have shown the needle point, air-tube and nozzle as integral; when so made, the connection with the valve 9 and injector 17 may be made in any suitable manner.

26 designates a thumb-screw which actuates a head 27 in both its forward and return movements.

28 indicates any suitable sealing material, such as rubber cement. The cap 23 may be soldered or otherwise suitably secured to the diaphragm 7, which is provided with an aperture therefor. The diaphragm 6 is provided with an aperture for the passage of the tubes 16 and 24.

Inasmuch as my invention is primarily designed for use in reviving or rejuvenating tennis balls I have in Figs. 2 and 3 shown a ball of that character, wherein 29 designates the rubber body and 30 the cloth cover. Balls of this character become useless, to perform their intended functions, both by lack of use and by use—that is, if they be left for a few months idle, even new balls lose their resiliency and become unsaleable, and balls which have been used in play become soft and also lose their "life" or rebounding qualities. These balls are relatively expensive, and their cost has heretofore been to many persons so prohibitive that the game has not gained such general popularity nor been so generally played as it would have been had some means and method of restoring their firmness and resiliency been devised. Assume the ball shown in Fig. 3 to have lost its resiliency and to be "dead." The operator may first puncture in it (with any suitable instrument) a minute opening, or he may puncture the ball with the needle 25. In either event the open ends of the tubes 16 and 24 are to be introduced into the ball cavity. He will then operate the pump 2 to thereby force air through the hose 3, valve 9 and air tube 16 to fill the ball cavity with compressed air, the operation being continued to whatever extent the operator deems best and as may be determined by manual pressure of the fingers and thumb upon the ball. The pumping operation is then discontinued, whereupon the check-valve 11 will automatically close and prevent the compressed air from escaping from the ball cavity. The screw 26 is then to be operated to force the cement through the nozzle 24, down which it will run, inasmuch as the device and ball are held in the positions shown in Fig. 1. As he forces the cement into the ball cavity the operator will slowly rotate the ball on the needle 25, thereby equally distributing the cement about the puncture. The needle may then be withdrawn and the cement will flow over and into the puncture, sealing it absolutely and perfectly, for the rubber cement will adhere strongly to the inner structure of the ball. If desired, the operator may hold his finger over the puncture for a moment, but I have seldom found this necessary. The advantages gained by having the needle 25 embrace the air and cement tubes is that were the tubes separate they would not together form a cylindrical body which would completely fill the puncture and prevent the escape of air, as does the needle.

Attention was earlier herein called to the fact that the air-tube projects farther into the ball cavity than does the nozzle. When thus arranged it is impossible for the cement to run into and clog or stop the air passage and it is also because I desire the cement to be introduced close to the puncture. Any other arrangement will, however, be productive of excellent results. It will be evident that the air pressure acts quickly on the semi or almost liquid cement to force it onto, over, and into the puncture, as shown best at x and z, Fig. 2, wherein I have illustrated a ball filled and sealed for the second time. As tennis balls are durably made they may be refilled and resealed until the material from which they are constructed wears completely out. Moreover, I contemplate my invention as of utility in the original filling, with compressed air, of all hollow, resilient objects or bodies.

It will be understood without detailed description how the caps 5 and 5′ are to be removed when it is desired to use the sealer and inflater, and also how the nipple 3′ is to be threaded into the valve-tube 10.

In the foregoing specification I have incidentally referred to modifications which might be adopted in the practice of my invention, but have by no means undertaken to specify all that might be employed, the object hereof being to instruct persons in order that they may understand the nature of and to enable them to carry out the invention in the manner specifically described and in any of the numerous manners which would appear to a skilled mechanic, and I desire it distinctly understood that the specific mention by me of some modifications is in no manner intended to exclude others not referred to but which are within the spirit and scope of the invention as defined in the appended claims.

Having thus set forth the preferred con-

struction, the purposes, some of the advantages, and the operation of the invention, I claim as new and desire to secure by Letters Patent the following, to-wit:

1. In a device of the character described, an air-tube, a spring-actuated air-inlet valve associated therewith, an air-pump in communication with said valve, a cement nozzle having its outlet adjacent that of the air-tube, and a cement-injector for forcing cement through said nozzle.

2. In a device of the character described, an air-tube, a source of air-supply, a check-valve intermediate said elements, a cement-nozzle having its discharge end adjacent the discharge end of the air tube, and means for forcing cement through said nozzle.

3. In a device of the character described, an air-tube, a source of air supply, a check-valve and a check-valve-return-spring intermediate said elements, a cement-nozzle having its discharge end adjacent the discharge end of the air-tube, and means for forcing cement through said cement-nozzle.

4. In a device of the character described, an air-discharge tube, means for forcing air therethrough, means whereby its return is prevented, and a cement-discharge tube having its discharge end adjacent the outlet of the air-tube.

5. In a device of the character described, an air-discharge tube, means for forcing air therethrough, means whereby its return is prevented, and a cement-discharge tube having its outlet adjacent that of the air-tube but not extended to as great a distance as is the latter.

6. In a device of the character described, an air-discharge tube, means for forcing air therethrough, means for preventing its return, a cement-nozzle adjacent said air-tube, and screw-propelled means for forcing cement through said nozzle.

7. In a device of the character described, an air-valve, an injector, a diaphragm in which they are mounted, an air-tube leading from said valve, a nozzle leading from said injector, a diaphragm in which said tube and nozzle are mounted, and a casing for retaining said diaphragms in spaced relationship.

8. In a device of the character described, an air-inlet tube, a source of air-supply therefor, a check-valve in communication therewith, a cement-nozzle in alinement with the outer end of the air-tube, and means for forcing cement through said nozzle, past said valve and through said tube.

In testimony that I claim the foregoing as my invention I hereto subscribe my name, in presence of two witnesses, at the said city of Galesburg, this 25th day of March, 1914.

ALLEN AYRAULT GREEN.

Witnesses:
F. O. McFARLAND,
E. P. WILLIAMS.