B. R. VAN VALKENBURG.

PUFF RETAINING RING.

APPLICATION FILED NOV. 4, 1913.

1,191,748. Patented July 18, 1916.

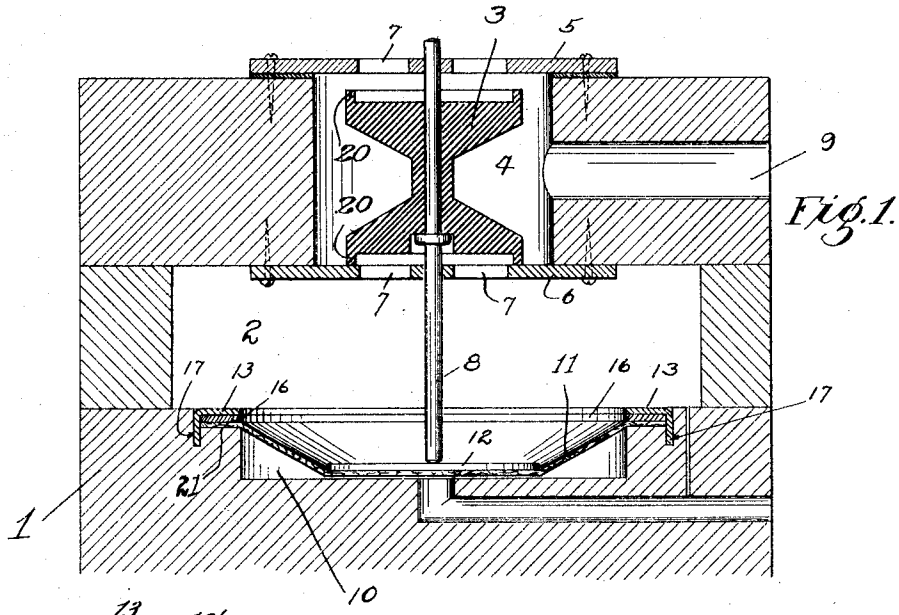


Fig. 1.

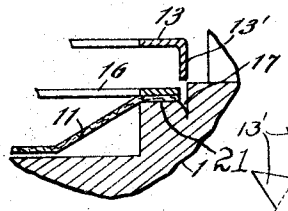


Fig. 4

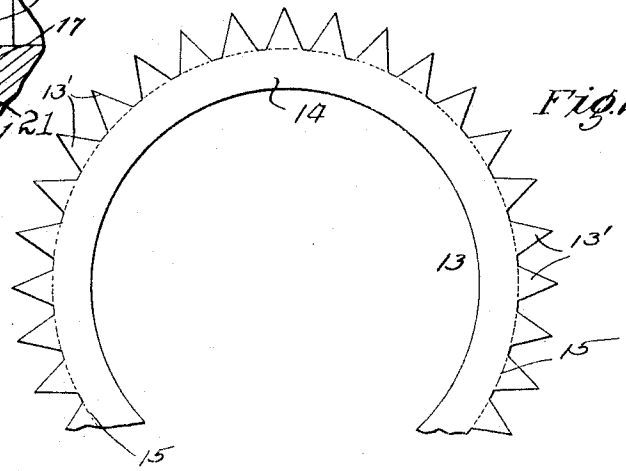


Fig. 2.

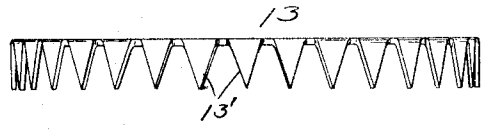


Fig. 3.

WITNESSES:

H. C. Stock

R. M. Ogarzo

INVENTOR

Burt R. Van Valkenburg

BY Harry Schroeder

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BURT R. VAN VALKENBURG, OF OAKLAND, CALIFORNIA, ASSIGNOR TO AMERICAN PHOTO PLAYER COMPANY, OF BERKELEY, CALIFORNIA, A CORPORATION OF CALIFORNIA.

PUFF-RETAINING RING.

1,191,748. Specification of Letters Patent. Patented July 18, 1916.

Application filed November 4, 1913. Serial No. 799,118.

To all whom it may concern:

Be it known that I, BURT R. VAN VALKENBURG, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Puff-Retaining Rings, of which the following is a specification.

This invention relates to valves used in connection with pneumatic player instruments and more specifically to means for holding the flexible diaphragm forming a part thereof.

The principal object of my invention is to provide improved means for holding the flexible diaphragm commonly termed the "puff". This puff is usually made of soft leather which is affixed to the surrounding surface by an adhesive compound. This has been found unsatisfactory in use, owing to leakage, as well as difficult to form properly. Owing to the fact that the leather is generally made continuous over adjacent holes, the cost is also high by this method.

With my improved method of holding the diaphragm, a piece of leather only slightly larger than the cell is used which is secured in position by a toothed retaining ring. This makes a secure fastening and one easily applied.

With these and other objects in view, my invention consists in the novel form and arrangement of parts as herein described and illustrated in the accompanying drawings, and as more specifically pointed out in the appended claims.

In the drawings:—Figure 1 is an enlarged view in vertical section of a pneumatic valve constructed in accordance with my invention showing the manner of using the retaining ring. Fig. 2 is an enlarged plan view of the retaining ring before bending. Fig. 3 is a view in elevation of a ring after bending. Fig. 4 is a detail view showing the groove before the retaining ring teeth are forced therein.

Referring more particularly to the drawings and denoting like parts by like numerals, 1 is the valve chest composed of several thicknesses of wood and having a vacuum chamber 2 which is connected to a suitable exhaust pump in the usual manner.

3 denotes a double faced valve in a cavity 4, the ends of which are closed by disks 5 and 6. The valve is shorter than the distance between these disks and passages 7 are provided therethrough so that the cavity 4 is always open either to the atmosphere or to the vacuum chamber 2. The valve is a solid spool turned so as to have two flanges 20—20 which project from opposite ends and which are adapted to cut off the passages 7 from the cavity 4 when in contact with the corresponding disk 5 or 6. The valve is attached to a stem 8, which passes through alining central openings in disks 5 and 6. A passage 9 leads from the cavity 4 to the operated mechanism such as a pneumatic used to operate a piano action.

In the lower part of the vacuum chamber is a cell 10 separated from the vacuum chamber by a flexible diaphragm 11. The latter is provided with an inflexible central disk 12, adjacent to which the valve stem 8 is terminated. This flexible diaphragm is held in place by the improved retaining ring 13 composed of an annular ring 14 having a series of saw-like teeth 13′ cut out on its outer periphery. These teeth are afterward bent at right angles along the dotted line 15, as clearly shown in Figs. 1 and 3.

In practice, I countersink the cell 10, as at 21, and place the puff so that its edge projects into the countersunk portion of the chest. Then I place an annular ring 16 of some material, such has stiff paper, over the edge of the puff and cut a thin annular groove 17 around the cell having a diameter equal to the circle of the teeth, but of a width slightly less. The parts are then assembled as shown in Fig. 1, the ring 13 being pressed down over the ring 16 until flush with the upper face of the vacuum chamber 2, the ring 16 resting in turn on the edge of the puff. The teeth 13′ are forced down into the groove 17 under considerable pressure and by reason of their size being larger than the groove, are held securely in place. The ring is thus held at all parts of its periphery and in like manner secures the diaphragm.

While I have described the preferred embodiment of my invention it will of course be understood that minor changes may be made in detail of construction and mode of application without departing from the spirit thereof.

Having shown and described my invention, what I claim is:—

1. The combination of a chest having a cell formed therein, a puff having its edges overlying the edges of said chamber, the wall of said chest having a groove surrounding said chamber on the outside of the edges of said puff, a metal ring overlying the edges of said puff and having a portion projecting at right angles thereto and having firm contact with the edges of said groove, said portion being of slightly greater thickness than the original width of said groove, and a packing ring intermediate said puff and said first mentioned ring.

2. The combination of a chest having a cell formed therein, a puff having its edges overlying the edges of said cell, a paper ring overlying the edges of said puff, a metal ring overlying the said paper ring and the edges of said puff, and means carried by said metal ring for retaining the said metal ring, paper ring and the edges of said puff in place.

3. The combination of a chest having a cell formed therein, a puff having its edges overlying the edges of said cell, said puff being of substantially circular formation, a rigid disk carried by said puff and concentric therewith, a paper ring overlying the edges of said puff, a metal ring overlying the said paper ring and the edges of said puff, and means carried by said metal ring for retaining said metal ring, paper ring, and the edges of said puff in place.

4. The combination of a chest having a cell formed therein, a puff having its edges overlying the edges of said cell, a disk of rigid material carried by said puff, the wall of said chest having a groove surrounding said chamber on the outside of the edges of said puff, a metal ring overlying the edges of said puff and having a portion projecting at right angles thereto and having firm contact with the edges of said groove, said portion being of slightly greater thickness than the original width of said groove, and a packing ring intermediate said puff and said first mentioned ring.

5. The combination with the base member of a chest having a cell or chamber formed therein, a puff having its edges overlying the edges of said chamber, the wall of said member having a groove surrounding said chamber on the outside of the edge of said puff, and a metal ring overlying the edge of said puff and having a portion projecting at right angles thereto and having firm contact with the edges of said groove, said portion being of slightly greater thickness than the original width of said groove where the ring is inserted therein.

6. The combination with the member of a chest having a cell formed therein, said member being counter-sunk around said cell to form a ledge and having a groove immediately surrounding the outer edge of said ledge and extending at right angles thereto, a puff covering said cell and having its edge resting on said ledge, and a metal ring having a portion parallel to said ledge, and overlying the edge of said puff, said ring having a second portion at right angles to the first mentioned portion thereof extending into said groove and having firm frictional contact with the edges thereof.

7. The combination with the member of a chest having a cell formed therein, said member being countersunk around said cell to form a ledge and having a groove immediately surrounding the outer edge of said ledge and extending at right angles thereto, a puff covering said cell and having its edge resting on said ledge, and a metal ring having a portion parallel to said ledge, and overlying the edge of said puff, said ring having a second portion at right angles to the first mentioned portion thereof extending into said groove and having firm frictional contact with the edges thereof, said last mentioned portion of the ring being of slightly greater thickness than the original width of said groove where the ring is inserted therein.

8. The combination with the member of a chest having a cell formed therein, said member being counter-sunk around said cell to form a ledge and having a groove immediately surrounding the outer edge of said ledge and extending at right angles thereto, a puff covering said cell and having its edge resting on said ledge, a metal ring having a portion parallel to said ledge, and overlying the edge of said puff, said ring having a second portion at right angles to the first mentioned portion thereof extending into said groove and having firm frictional contact with the edges thereof, and a packing ring intermediate the first mentioned portion of said metal ring and the edge of said puff, the thickness of said puff, said packing ring and the first mentioned portion of said metal ring being equal to the depth of the counter-sink surrounding said cell.

9. The combination with the member of a chest having a cell formed therein, said member being countersunk around said cell to form a ledge and having a groove immediately surrounding the outer edge of said ledge and extending at right angles thereto, a puff covering said cell and having its edge resting on said ledge, a metal ring having a portion parallel to said ledge, and overlying the edge of said puff, said ring having a second portion at right angles to the first mentioned portion thereof extending into said groove and having firm frictional contact with the edges thereof, and a packing ring intermediate the first mentioned portion of

said metal ring and the edge of said puff, the thickness of said puff, said packing ring and the first mentioned portion of said metal ring being equal to the depth of the counter-sink surrounding said cell, the second mentioned portion of said ring being of slightly greater thickness than the original width of said groove where the ring is inserted therein.

10. The combination of a chest having a cell, or chamber, formed therein, a puff, the edges of which overlie the edges of said chamber, and a retaining ring engaging and overlying the edges of said puff and having a portion extending at an angle thereto and to the plane in which the puff extends and embedded in the wall of said chamber.

11. The combination of a chest having a cell, or chamber, formed therein, a puff, the edges of which overlie the edges of said chamber, the wall of said member containing a groove surrounding said chamber, and a retaining ring engaging and overlying the edges of said puff and having a portion extending at an angle thereto and to the plane in which the puff extends, and confined in said groove.

12. The combination of a chest having a cell formed therein, said member being countersunk around said cell to form a ledge and having a groove immediately surrounding the outer edge of said ledge and extending substantially at right-angles thereto, a puff covering said cell and having its edge resting on said ledge, and a relatively stiff ring having a portion substantially parallel to said ledge, and overlying the edge of said puff, said ring having a second portion at substantially right-angles to the first-mentioned portion thereof extending into and confined in said groove.

In testimony whereof I affix my signature in presence of two witnesses.

BURT R. VAN VALKENBURG.

Witnesses:
ETHEL VAN VALKENBURG,
W. A. STOCK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."