

May 14, 1968

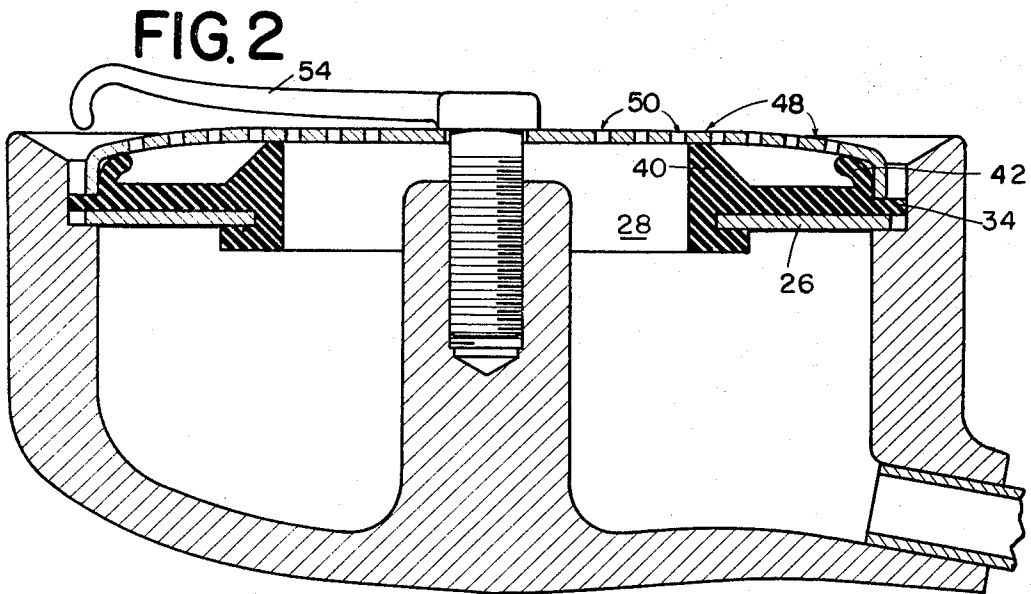
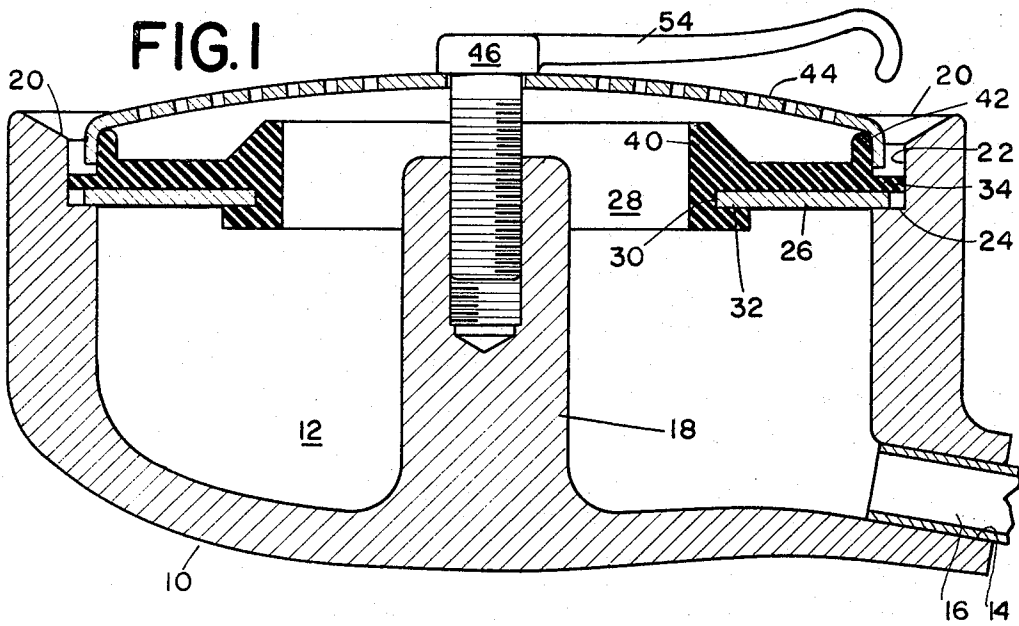
B. CRIST ET AL

3,383,050

SHOWER HEAD

Filed Sept. 27, 1966

2 Sheets-Sheet 1



INVENTORS:
Buckley Crist
Ralph F. Wolf.

William H. Bender
ATTORNEY

May 14, 1968

B. CRIST ET AL

3,383,050

SHOWER HEAD

Filed Sept. 27, 1966

2 Sheets-Sheet 2

FIG.3

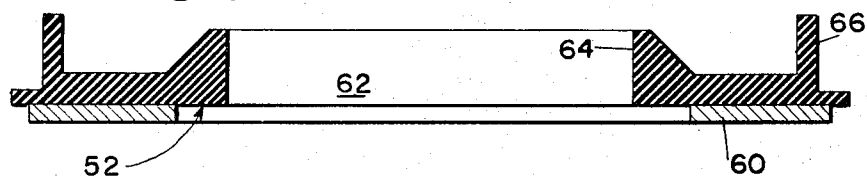


FIG.4

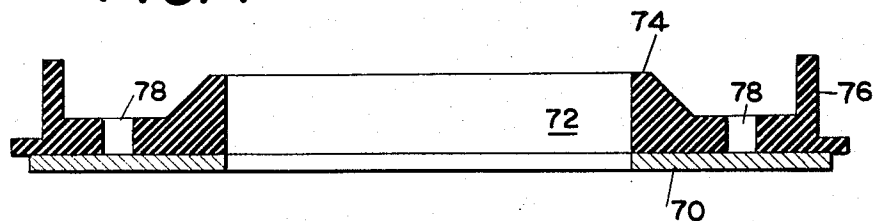
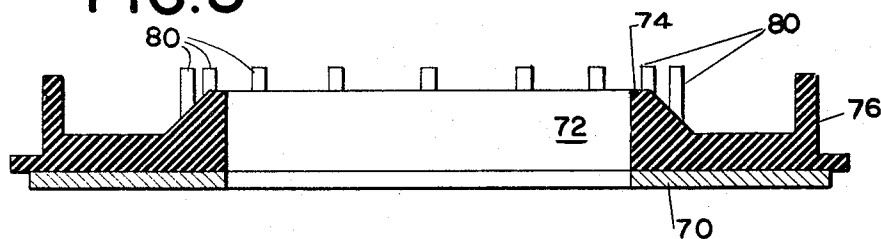


FIG.5



INVENTORS
Buckley Crist
Ralph F. Wolf

William H. Reider
ATTORNEY

1

3,383,050

SHOWER HEAD

Buckley Crist, 3 Taylor Road, Downingtown, Pa. 19335,
and Ralph F. Wolf, Lancaster, Pa., said Wolf assignor
to said Crist

Filed Sept. 27, 1966, Ser. No. 582,312
6 Claims. (Cl. 239-436)

This invention relates in general to shower heads and in particular is concerned with a shower head construction for the portable type of shower, that is of the type which is designed to be hand held by the user for attachment to a water source.

Portable (hand held) type shower heads of the prior art have their component parts arranged in a compact assembly of operable elements which are constructed of light weight materials and arranged for attachment to a water source. Such portable units are advantageously used under conditions where living spaces are confined or do not have the normal shower bath appurtenances.

The present invention is an improvement over the known portable type shower heads of the prior art in that it is constructed in a manner which enables the user to alter the spray pattern to meet conditions of limited water supply such, for example, as in house trailers, boats, camps, etc. or under conditions where it is advantageous to use only a minimal controlled amount of water as when shampooing pets or localized spray operations. In addition, it can provide a soft full spray or a powerful needle spray using full water supply.

The invention, in its broad aspects, contemplates a shell or housing which forms a cup shaped chamber for the admission of water from a source and from which the water is dispensed. For the purpose of dispensing the water, a perforated cover embraces the cup shaped chamber and the cover is arranged to be readily attachable and removable for the insertion of elements which permit the pattern of dispensing the water to be controlled by the user. For this purpose an annular diaphragm type of valve assembly is located within the cup shaped chamber adjacent its inner peripheral edge. The diaphragm valve assembly may take a variety of physical forms but each will be constructed to provide an outer sealing arrangement between the perforated cover and the shell or casing in order to prevent leakage and an inner sealing arrangement with the perforated cover which is operative to seal off a zone of perforations and thus control the pattern of water which is dispensed.

The principal object of the invention is to provide a shower head construction which permits control by the user of the manner of dispensing the water and adapting to a wider range of the amount of water being dispensed.

Another object of the invention is to provide a valve assembly for a perforated shower head which permits manual adjustment by the user for regulating the manner of dispensing and the amount of water being dispensed.

Another object of the invention is to provide a valve assembly for a perforated shower head wherein an outer seal is provided to prevent water leakage and an inner seal is provided to reduce the effective dispensing area of the shower head and the range of volume of water being dispensed.

Other and more detailed objects of the invention will become apparent from the following description read in connection with the drawings in which

FIGURE 1 is a longitudinal sectional view of a shower head showing the valve assembly of the invention in one position.

FIGURE 2 is a view similar to FIGURE 1 showing the valve assembly in another position.

2

FIGURES 3, 4 and 5 are sectional views of modifications of the valve assembly of FIGURES 1 and 2.

In FIGURE 1, the shell or casing is indicated at 10 and is preferably constructed of light weight material such as a molded plastic material which may be readily manufactured to provide a central cup shaped chamber 12 and a communicating inlet 14 for the supply of water to the chamber. This can be accomplished by means of a conduit 16 which may be formed with the casing 10 or may be a separate flexible conduit suitably secured to the casing. A central lug 18 is formed integrally with the casing 10 and extends upwardly and generally centrally thereof and the upper end of the casing 10 provides an opening defined by the upper edge 20 of the casing 10 which may be tapered as shown.

The cup shaped chamber 12 is expanded adjacent its upper end by the formation of an inner circumferential recess 22 in the casing 10 which terminates in a shoulder 24 and these features provide an arrangement for receiving the valve assembly. The valve assembly in FIGURES 1 and 2 consists of an annular generally rigid disk 26 and a resilient or pliable diaphragm 28. The rigid disk may, for example, be formed of sheet brass or stainless steel and will be seated on shoulder 24 as shown in FIGURES 1 and 2 to prevent relative movement between the casing and the diaphragm in the recess 22. The resilient or pliable diaphragm 28 may, for example, be rubber. In FIGURES 1 and 2 the diaphragm has a groove 30 formed therein which receives the inner peripheral edge portion 32 of the disk 26 and maintains a spaced relationship between the diaphragm and cover against water pressure and flow. The diaphragm also has its outer peripheral edge 34 in sealing relation with the inner face of recess 22 in order to prevent leakage of water through the recess 22.

Additionally and importantly, the diaphragm 28 is provided with inner and outer annular ribs 40 and 42, respectively, which are located in spaced relation on the diaphragm 28 and provide seals with the cover. The perforated cover is indicated at 44 and is secured to the shell or casing 10 by means of a connector 46 having a threaded area which mates with a threaded area in the central lug 18 as is well understood.

In FIGURE 2, the valve assembly which comprises the annular disk 26 and the diaphragm 28, is shown in the position it acquires as the cover 44 is urged downwardly by the adjusting screw 46. In the position shown in FIGURE 2, the inner rib 40 and outer rib 42 are in contact with the inner face of the cover 44 to seal or block off the perforated area defined by the arrowed lines indicated at 48 and to direct the water from inlet 14 to the central perforated area represented by the arrowed lines indicated at 50, and consequently only the central portion of the shower head will be permitted to dispense water.

In addition to sealing off the perforated area 48, it is to be noted that the annular rib 42 effects a sliding seal with the peripheral edge of the cover 44 at all times. The outer peripheral edge 34 of the diaphragm effects a seal with the inner face of recess 22.

In order for the user of the shower head to effect readily the control of the pattern of water which is to be dispensed, a control arm 54, which is preferably in the form of a narrow or thin wire arm in order to minimize interruption of the water dispensed, is fixed to the adjusting screw 46 and by the proper selection of the mating threads between the screw 46 and the central lug 18 this adjustment may be made with a minimum of effort.

It will be appreciated that the disk 26 and diaphragm 28 may be otherwise secured together or assembled. This may be readily accomplished by cementing or bonding the elements together and it should be understood that the

3

shapes and forms of the diaphragm element may be varied from that shown in the drawings. The modifications of FIGURES 3, 4 and 5 are provided to show other valve assemblies which may be used.

In FIGURE 3, the rigid disk is indicated at 60 and the diaphragm at 62 forming a cemented or bonded unit. The inner and outer annular ribs or seals are indicated at 64 and 66, respectively, and in use, the inner seal 64 is operative by water pressure to snap into sealing relation with the perforated cover 44 to block off the perforated area 48 when the distance between the seal rib 64 and the inside of cover 44 is diminished enough to build up a water pressure differential indicated by 52 against the unattached inner peripheral edge of the diaphragm 62.

In FIGURES 4 and 5, the rigid disk is indicated at 70 and the diaphragm at 72. In these figures, the element 72 reposes on the disk 70 and is movable relative thereto by the water pressure until the annular ribs 74 and 76 contact the cover. In FIGURE 4, a series of apertures 78 are provided for balancing water pressure on the diaphragm 72, when the diaphragm and the disk are slightly separated. As cover 44 is depressed toward sealing engagement with the diaphragm, snap action is avoided through the diversion of some water passing through orifices 78 until sealing engagement takes place between the cover, diaphragm and disk.

In FIGURE 5, a series of biasing lugs 80 are provided peripherally spaced as shown, which are longer than the annular ribs 74 and 76. These biasing lugs 80 come into contact with cover 44 prior to sealing engagement with the diaphragm and are compressed as the cover is forced into sealing engagement with annular rib 74. On release of the downward pressure on cover 44, the compressed lugs effect a positive separation between the diaphragm and the cover.

Obvious changes or variations from the structure shown are within the purview of the invention which is to be limited only by the scope of the appended claims.

We claim:

1. A shower head construction which comprises
 - (a) a casing having wall structure forming a chamber providing an open water dispensing end and an inlet for supplying water to the chamber,
 - (b) a continuous recess in the inner wall of the casing merging with the open water dispensing end and providing a continuous shoulder,
 - (c) a valve assembly comprising a rigid disk supporting a resilient diaphragm and positioning the outer periphery of the diaphragm in sealing relation with the inner face of the recess,

4

(d) said rigid disk and said diaphragm having apertures disposed in alignment permitting the passage of water from said inlet to said dispensing end of the chamber,

(e) a cover having a continuous outer flange movably received in said recess and a perforated area generally defined by the outer flange,

(f) continuous spaced sealing ribs on said diaphragm extending toward said cover,

(g) connector means between the cover and the casing permitting adjustment of the cover toward said diaphragm and,

(h) means exteriorly of the cover permitting manual adjustment of the cover to a position whereby the continuous ribs contact the cover and are effective to seal off a part of the perforated area of the cover and to permit water to be dispensed through the remaining perforated area.

2. A shower head construction as set forth in claim 1 further characterized by said valve assembly permitting the continuous sealing rib of the diaphragm to move rapidly into contact with the inner face of the perforated cover under the influence of the water pressure differential between lower and upper sides of diaphragm.

3. A shower head construction as set forth in claim 1, further characterized by said disk and said diaphragm being secured together as a unitary assembly.

4. A shower head construction as set forth in claim 3, further characterized by said diaphragm having a continuous groove therein for receiving and securing the inner periphery of said disk.

5. A shower head construction as set forth in claim 1, further characterized by said diaphragm having apertures between said upper and lower surface.

6. A shower head construction as set forth in claim 1, further characterized by said diaphragm having biasing projections to urge separation from the perforated cover.

References Cited

UNITED STATES PATENTS

2,086,017	7/1937	Donahue	239—596 X
2,382,066	8/1945	Klein	239—436
2,559,894	7/1951	Nordell	239—568 X

FOREIGN PATENTS

92,460	10/1959	Netherlands.
--------	---------	--------------

SAMUEL F. COLEMAN, *Primary Examiner.*