

R. W. HYDE
SHOWER HEAD

Filed Feb. 18, 1959

2 Sheets-Sheet 1

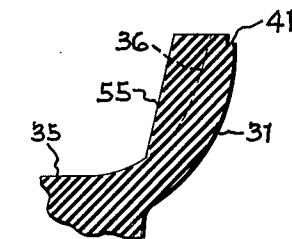


Fig. 3

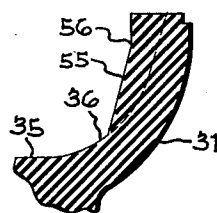


Fig. 4

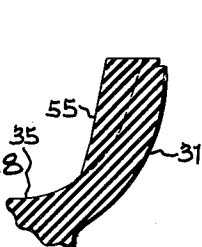


Fig. 5

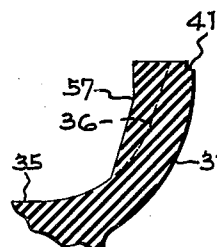


Fig. 6

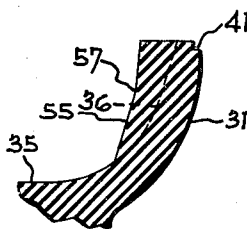


Fig. 1

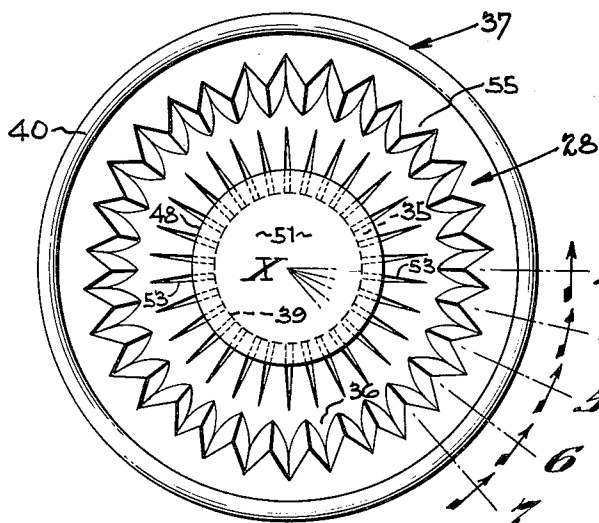


Fig. 2

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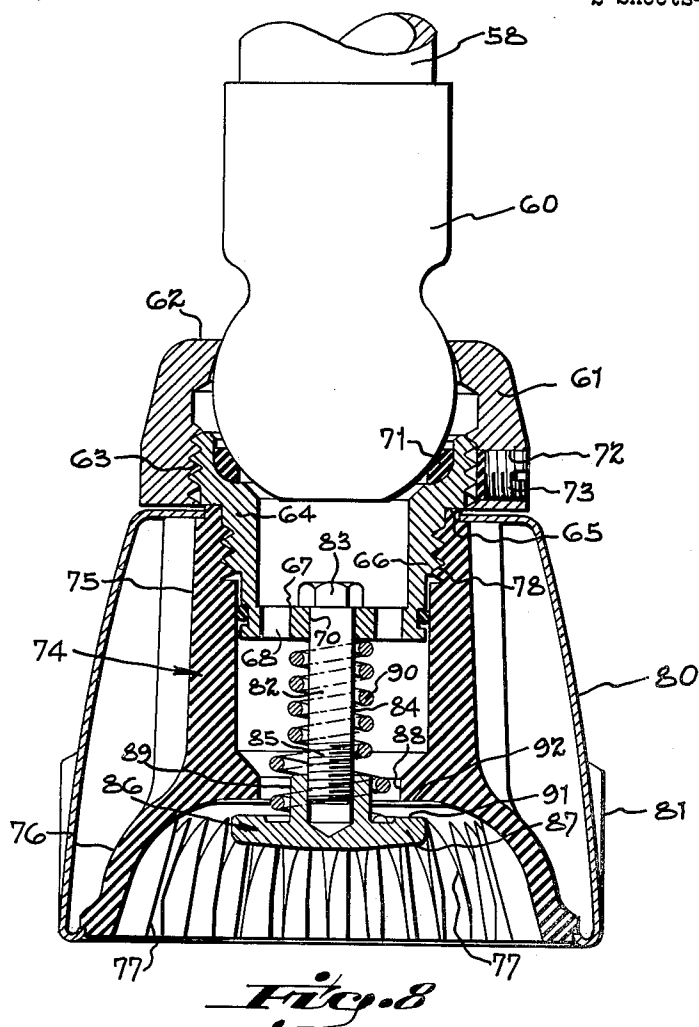
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2,990,123

SHOWER HEAD

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2 Sheets-Sheet 2



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2,990,123 SHOWER HEAD

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This invention relates to an improvement in shower heads, which are the fixtures used in shower installations at the end of the water inlet pipe and which serve to break up the single stream of water in the pipe into a shower consisting of a great many tiny streams, or "jets," of water issuing from the head. More particularly, it relates to an improved construction for such fixtures, which, in comparison with other shower heads, is relatively simple and inexpensive to manufacture, yet which demonstrates improved operating characteristics.

In a shower bath, a water inlet line enters the bath stall at an elevation somewhat above the head of the average bather. The shower head is connected to this water inlet line, at the outer end of the line. When the shower is turned on, a flow of water from the pipe enters the head and, in passing through the head, is broken up by it into small streams of high velocity which issue from the head in angular relationship with one another, in such fashion that below the head, the streams define an approximately conical pattern. In the case of certain types of shower heads, all of the jets leave the head at the same angle with respect to the main axis of flow and at the same distance from that axis, so that these jets occupy a conical shell, with the objectionable result that there is no "wetting" inside of this conical shell. One purpose of the present invention is the provision of a shower head which directs the jets leaving it so that the entire volume of the cone below the head is traversed by direct streams of water, whereby there is more uniform wetting throughout the cone.

It frequently happens, after a shower head has been in use for some time, that it becomes clogged at the individual orifices from which the jets of water issue, with the result that flow is not uniform from all orifices; from some no water issues at all, while from others virtually a solid stream descends. Another objective of this invention is the provision of a shower head from which flow will consistently be radially symmetric about the axis of flow.

In a modified version, the shower head of this invention may be made adjustable so that the kind of flow from it is variable; that is, by altering the adjustment of the head, one may readily obtain, as desired, any kind of flow ranging from sharp, needle-like jets on the one hand, to nearly a solid stream of water on the other.

Briefly put, the principle of this invention is the concept of breaking up a solid stream of water entering the head from an inlet line into a uniform multi-stream spray by first impinging the stream on a surface perpendicular to the axis of flow of the stream, which surface turns the flow radially outward, then passing it as a circular sheet of uniform thickness through a cylindrical annular orifice, which in turn directs it into uniquely shaped grooves configured to accelerate it downwardly and form a diffuse spray of the desired even distribution. I have discovered configurations for these grooves and an inter-relationship between them by which the spray is directed, as it leaves the head, so that it fills the entire volume of the cone of flow extending below the shower head.

The details of my invention may best be further explained by reference to the drawings in which:

FIGURE 1 is a partial longitudinal section through a shower head constructed according to the principles of this invention.

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FIGURE 2 is a bottom plan of the shower head, showing the arrangement of the channels which form and direct the spray of water from the head.

FIGURE 3 is an inverted fragmentary longitudinal section through one of the channels, taken on line X-3 of FIGURE 2.

FIGURE 4, similar to FIGURE 3, is an inverted fragmentary longitudinal section through another channel, taken on line X-4 of FIGURE 2.

FIGURE 5, similar to FIGURE 3, is an inverted fragmentary longitudinal section through another channel, taken on line X-5 of FIGURE 2.

FIGURE 6, similar to FIGURE 3, is an inverted fragmentary longitudinal section through another channel, taken on line X-6 of FIGURE 2.

FIGURE 7, similar to FIGURE 3, is an inverted fragmentary longitudinal section through another channel, taken on line X-7 of FIGURE 2.

FIGURE 8 is a partial longitudinal section through a modified version of the invention, in which are incorporated means for adjusting the kind of flow from the head.

In FIGURE 1, the outer end of a water inlet line of a shower bath is indicated at 11. In a manner not shown in the drawing, this pipe extends rearwardly through the wall or partition enclosing the shower bath, and is connected to a source, through conventional valves for regulating the volume of flow through it. This pipe 11 is connected by threads or other suitable means to a ball coupling 12. The coupling 12 has a collar 13 which may be internally threaded to receive threading on the end of the pipe 12, a constricted neck portion 14 below the collar 13, and terminal ball 15 of substantially spherical shape. The entire coupling 12 is hollow, and has an opening 16 at the lower end of the ball 15, so that water from the inlet pipe 11 may flow through the coupling into the head attached thereto. The reason for the provision of this ball coupling is, of course, so that the angulation of the shower head with respect to the pipe may be set by the bather at will. It is, in essence, simply a universal joint, and it comprises no part of the invention. It may be omitted, if desired, and the shower head connected directly to the inlet pipe 11 without departing from the principles of the invention.

The shower head proper is indicated generally at 17, coupled to and depending from the ball 15. In the preferred embodiment shown, it has the shape of a bell or inverted funnel. At its upper end is a cap 18 which encircles the ball 15 and holds the head to the ball. The cap 18 has a cylindrical body 20, is internally threaded as at 21 whereby it is fastened to the remainder of the head, and has an inwardly-turned lip 22 at its upper end. This lip has an angulated inner edge 23, shaped so as to approximate the shape of the adjacent portion of the spherical ball 15. The distance between diametrically opposed portions of the lip 23 is less than the diameter of the sphere, so that no matter how the cap (and head) are turned with respect to the ball 15, the cap remains attached to the ball coupling by the outwardly-sloping surface of the sphere. (The fit between the edge 23 and the ball 15 need not be perfect; that is, it need not be watertight, because a seal for that purpose is elsewhere provided, as will be subsequently described.) The minimum distance between opposed points on the lip 23 is greater than the diameter of the collar 13 of the ball coupling 12, so that, in assembling the shower head, the cap may be slipped over the collar 13, past the neck 14, to a point at which the edges 23 come into contact with the ball 15, and the coupling is then screwed onto the inlet line 11. The body 20 of the cap may be knurled as at 24 to provide a grip for use in tightening it on the line.

Threaded into the lower end of the cap, as at 25, is

a hollow cylindrical connector 26 having an outwardly-jutting flange 27 at its lower edge. This connector is permanently attached at the top of the body of the shower head and removably connects it to the cap above.

The diffuser element of the shower head is indicated generally at 28. This comprises in the preferred embodiment a relatively long hollow upper stem portion 30 and a sprayer portion 31 integral with the stem portion located beneath it, the sprayer portion having somewhat the shape of an inverted cup and being internally configured with spray-forming channels. It is the sprayer, via these channels, which imparts the desired final directions to the individual jets of the spray, as will be subsequently explained. At its upper end, the stem 30 of the diffuser 28 has an annular horizontal shoulder 32 jutting outwardly. Above this shoulder, the stem is of an outside diameter equal to the inside diameter of the connector 26, and extends up into the connector so that shoulder 32 abuts the lower surface of flange 27. The stem, being hollow, presents a longitudinal passageway or bore 29, which is stepped to provide a ledge 33, whereon is seated a "spider" 34. At its lower terminus, the bore 29 presents a circular opening. Below the stem 30 and about the circular opening 39 at the end of the bore, the sprayer portion 31 of the diffuser fares out in the manner previously described, the inside surface of the sprayer being perpendicular to the wall of the bore 29 in a substantially flat annular area 35 adjacent the circular line 39 at which these two surfaces meet, and gradually slopes downwardly and outwardly as at 36, beyond the annular area 35. A jacket 37 holds the diffuser to the connector 26, extending around the outside of the diffuser. An inwardly turned rim 38 at the upper end of the jacket 37 resides in contact with upper surface of flange 27 on the connector, and at the lower edge of the jacket, an inwardly-turned ring 40 bears against an outside ledge 41 presented by the diffuser. The diffuser is held upwardly by this ring 40 so that the shoulder 32 of the stem is urged tightly against the bottom side of flange 27.

A washer 42 formed of neoprene or other suitable material sits atop the upper end of the diffuser inside connector 26, its inside upper edge bearing against and forming a watertight seal with the ball 15. It can be seen that, as the cap 18 is tightened on the connector 26, it draws the connector upwardly, being itself unable to shift longitudinally with respect to the ball, along with the jacket 37 and diffuser 28 attached thereto, squeezing washer 42 between the upper end of the diffuser and the ball 15, forming the seal, so that water issuing through the opening 16 in the ball cannot escape out the cap. By means of the knurling 24 on the cap, the bather may partly unscrew the cap from the connector, thereby easing the pressure on the washer, so that the angulation of the head with respect to the inlet line may be changed. After making this adjustment the cap should, of course, be re-tightened to hold the head in the desired new attitude.

The spider 34 disposed transversely across the bore 29 of the stem 30 is simply a baffle plate having longitudinal passageways 43 formed in it. Through a central opening 44 in the spider loosely extends the shaft of a screw 45, having a head 46 of enlarged diameter situated above the spider 34, and threading 47 below the spider. It is the function of the spider to generally support screw 45 in this attitude, so that it is roughly aligned with the axis of the bore 29 of the stem. The openings 43 merely provide passageways whereby water may flow past the spider into the lower part of the bore 29.

Connected to the screw by the threading 47 at its lower end is a button 48, having a relatively narrow shank 50 and a head 51 of diameter greater than that of the circular opening 39, so that the head 51 resides outside of and below the bore 29, that is, in the interior of the sprayer 31 having its axis generally coincidental with that of the

bore. Hence, the flat upper surface 52 of the head of the button is set perpendicular to the axis of the bore; that is, it lies parallel to the adjacent annular area 35 on the inside surface of the sprayer. A spiral spring 49 encircles the shaft of screw 45, disposed between the spider 34 and head 46 of the screw. This spring is normally compressed to urge the screw upwardly in the bore so that the upper surface 52 of the head of the button resides in facial contact with and bears against the parallel annular area 35 of the sprayer.

By virtue of this arrangement, a flow of water moving axially in the bore of the diffuser is turned radially outward upon impinging on the button, compressing the spring and passing through the opening thus formed. The imparting of this radial motion constitutes an important feature of this invention, in that by virtue of it a symmetrical flow is obtained.

The inside surface 36 of the sprayer 31 is configured with two sets of water channels. That annular portion (designated at 35) of the surface around the circular outlet 39 at the end of the bore and which is adjacent and parallel to the button surface 52 is configured with in-cut, shallow, radial, outwardly-tapering grooves 53 extending from the edge 39, where surface 35 right angularly meets the inside wall of the stem, outwardly, beyond the edge of button 48, to a point at which the inner surface 36 of the sprayer begins to turn downwardly. These grooves 53 "run out" at their outer ends, becoming shallower with increasing distance from the axis of the bore. A second set of channels, designated 55 in the drawings, is formed in the sprayer surface 36 outwardly of the first set of grooves 53. The channels 55 are more nearly parallel to the longitudinal axis of the diffuser than are channels 53, and are more deeply cut than the other grooves. The relationship between the two sets of grooves is such that there is a separate cooperating channel 55 for each groove 53, the deepest point of each groove and its correlative channel lying in the same axis-containing plane. Thus the grooves 53 direct the water right into the channels 55.

I have also discovered that, by properly locating and shaping the channels 55, they direct and deflect the streams of water entering them at their upper ends from the grooves 53 and the annular orifice formed between parallel surfaces 35 and 52, in such fashion that the entire volume of the cone of flow below the shower head is wetted. In accordance with my determination, the channels 55 are individually shaped to different configurations. As may best be seen from FIGURE 2, in a preferred embodiment of my invention, there are thirty channels 55 spaced around the inside surface 36 of the sprayer (and, correspondingly, thirty cooperating grooves 53). These thirty are comprised of six repeating subsets, each consisting of five grooves. Each of the five grooves in a given subset are differently shaped, all subsets, however, being similar to one another. FIGURES 3, 4, 5, 6, and 7 are inverted fragmentary longitudinal sections taken through the "ridges" of the five different types of channels in each subset, showing the manner in which they vary in shape. It can be seen that they vary in depth, that is, in the extent to which they are cut into the surface 36, as well as in shape, some having a break, as at 56 and 57, and others being straight along the ridge. It is by means of the channels thus formed that the radially-moving sheet of water is directed and sprayed so that complete wetting in the cone is obtained.

For further explanation of the principles of this invention, consider the manner in which the shower head acts on an entering stream of water. When the shower is turned on, a stream of water from the inlet pipe 11 enters the ball coupling 12, flows through the opening 16 at the bottom of the ball into the bore 29 of stem 30, above the spider 34. The openings 43 in the spider

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permit it to pass into the chamber below the spider and above the button 48. These chambers all having filled with water, the water exerts a fluid pressure on the upper surface 52 of the yieldably mounted button 48. This pressure urges the button downwardly and away from surface 35, and spring 49 is compressed between the head 46 of the screw and the spider 34, so that a retarding force, upwardly exerted, acts on the button against the fluid pressure. Depending on the pressure of the water, that is, depending on the extent to which the shower has been turned on, surface 52 of the button is spaced to a greater or lesser degree from surface 35 of the diffuser. The water immediately above the button is afforded a means of egress through the cylindrical annular orifice formed between these two surfaces. It can be seen that the effect of the button, set in the axial flow path of the water, is to turn the direction of flow of the water from axial motion to motion which is radially outward, the water passing through the orifice as a thin circular sheet of uniform thickness. Moving radially outward at high velocity, the water is then accelerated downwardly by the curved inner surface 36 of the head so that it flows into the upper end of the channels 55. Encountering the sloping sides of these channels at high speed and as a thin sheet, flow is broken up by the channels into a diffuse spray which, as previously described, wets the entire volume of the cone of flow beneath the head.

As was previously recited, the shank of screw 45 resides loosely in the opening 44 provided in the spider. The reason for establishing a loose fit is that by doing so the button is made "self-aligning," whereby at all times, the thickness of the radial sheet of water is maintained constant around the button, and the spray from the shower head is axially symmetric. This self-aligning effect apparently is caused as follows:

Assuming that, for some reason, the fluid pressure on the right hand side of the button surface 52 in FIGURE 1 is greater than that acting on the left hand side of the button, more water would be forced through the right hand part of the annular opening above the button than would pass through the left hand portion, with the final result that the spray coming from one side of the shower would be very heavy, while that coming from the other would be inordinantly light. However, because of the Bernoulli effect, the right-hand part of the sheet, moving at higher velocity, exerts less downward pressure on the button than does the shower moving stream on the left. Consequently, the button tilts, the screw tipping in its mounting so that the pressure becomes everywhere equal and the spray uniform.

In general, the greater the volume of flow through the shower head, the greater will be the spacing between the button and annular area 35. However, in the instance of a very light flow the pressure on the button may be insufficient to compress the spring at all so that the button remains tightly seated against the surface 35. It is for this reason that the radial grooves 53 are provided. While these are small and can pass no great volume of water, they do provide a means of egress for flow which is insufficient to push the button away so as to flow as a uniform sheet. Thus, although the button remains seated against surface 35, there is at all times a minimal amount of radial passageway through which water may move. In addition to this, because of their orientation, the grooves 53 direct the water moving in them right into the channels 55. While annular area 35 and surface 52 of the button have been described as residing in planes perpendicular to the axis of the bore, it should be noted that that is not essential; it is sufficient if they are shaped to "fit" one another over a curved or spherical, rather than planar, region, and so long as flow moves as a thin sheet between them in a direction which is sharply angled, i.e. nearly 90°, with respect to the longitudinal axis.

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The invention may conveniently be fabricated from metal or plastic. It has been found most suitable to mold the diffuser of plastic, because presently developed molding techniques for plastic enable one to most precisely mold the configurations of the grooves 53 and 55 into it. The cap 18, connector 26, button 48, and screw 45, are machined from conventional techniques in metal or plastic, and jacket 37 may be pressed from sheet metal. Spring 49 should, of course, be made of non-rusting metal.

A modified version of the invention is shown in longitudinal section in FIGURE 8. In this modification, provision is made for varying the kind of spray from the head while holding the rate of flow constant. That is, by a simple adjustment one may obtain any type of spray ranging from a very sharp needle-like spray on the one hand to a very dense, heavy spray on the other. It will be apparent that in a shower head embodying the principle of this invention, the kind of spray obtained depends only on the spacing between the button surface 52 and the adjacent annular area 35, for any given volume of flow. In the standard embodiment described above, this distance was not variable independently of rate of flow, with the result that, at a high rate of flow, the spray from the head is very fine, and at a low rate of flow, the spray is very heavy. In the modified version shown in FIGURE 8, an inlet pipe and ball coupling similar to those previously described are shown at 58 and 60 respectively. A hollow cap 61 having an inwardly turned lip 62 making a fit with the ball, depends from the ball and has internal threading 63. Into the lower end of this cap is threaded a hollow connector 64 having an overhanging external shoulder 65 and an externally threaded lower body 66. At the lower end of the connector 64 is a spider 67 provided with orifices 68 and a central opening 70. A washer whereby a seal between the shower head and ball coupling is made, is set into the connector at 71. A radial drill hole 72 tapped to receive a set screw 73 is provided in the cap 61 so that by tightening the set screw 73 the cap may be permanently locked to the connector 64. A diffuser generally similar to the one previously described is indicated at 74, and has a hollow upper stem portion 75 and a lower sprayer portion 76, the latter being configured, as before, with diffusing channels 77. The diffuser is threaded at 78 onto the lower body 66 of the connector, but is mounted thereon loosely enough so that it may be turned on the connector. As before, the diffuser is jacketed by a pressed sheet metal covering 80, to provide a neater appearance. Ribbing or knurling 81 is provided on the jacket 80 to provide a convenient grip so that the diffuser to which it is attached may readily be rotated about the connector. A machine screw 82 having an enlarged head 83, a long shank 84 and threading 85 at its lower end extends downwardly through the opening 70 in the spider 67, its head resting on the spider. A button 86 having a head 87 of diameter greater than the opening 88 at the lower terminus of the bore in the diffuser, and a neck 89 of narrower diameter is held by the screw 82. A coil spring 90 encircles the screw 82, extending between the spider 67 and the head 87 of the button which, normally being under slight compression, maintains the head 87 spaced at the maximum possible distance from the spider permitted by the length of the screw. Again the screw is loosely held by the spider, there being a certain amount of play in opening 70. By manually rotating the diffuser on the connector 64, it is caused to translate in or out relative to the connector, so that the spacing between the upper surface 91 of button head 87 and substantially flat annular area 92 around the opening 88 at the lower end of the bore, may be increased or diminished, since the button is spaced at a fixed distance from the connector. Therefore, by rotating the diffuser counterclockwise, the height of the annular orifice between surfaces 91 and 92 is diminished, and the

spray becomes finer; that is so regardless of the volume of flow. Conversely, by rotating the diffuser clockwise, the height of the orifice is increased, and the spray becomes heavier. In consequence of the loose fit of screw 82 in opening 70, the self-aligning effect is again obtained, so that at all times the spray is radially symmetric. Spring 90, in the modified version, acts with the force of the water rather than against it as before, and merely maintains the axis of screw 82 in coincidental relationship with the longitudinal axis of the diffuser, so that button 86 is at all times centered with respect to opening 88, regardless of the angle at which the shower head is set. Radially-extending grooves, extending outwardly from opening 88 are molded into the annular area 92 as before, to permit flow even when surfaces 91 and 92 are in facial contact. Other than in the respects described, the operation and construction of this modified version of the shower head is similar to that of that one previously described.

Having described my invention, I claim:

1. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said water outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said circular opening to provide a flat annular wall area immediately surrounding said opening which is in a plane normal to the central axis of said opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said flat annular wall area, the latter outwardly and downwardly rounding wall area terminating in a spray section which flares to a lower rim for the shower head, a circular button which has a diameter greater than said circular opening and which has a flat inner face, means within said passageway to mount said button such that the flat inner face thereof resides adjacent to said flat annular wall area, the latter named means permitting longitudinal shifting movement of the button toward and away from said flat annular wall area to open and close the circular opening and permitting limited sideways shifting movement of the button so that it may respond to different pressures of water flowing between its inner face and said flat annular area.

2. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured integrally below said opening to provide a flat annular wall area immediately surrounding said opening which is in a plane common to the periphery of the opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said flat annular wall area, the latter outwardly and downwardly rounding wall area terminating in a spray section which flares to an outer rim for the shower head, said conical spray section having a plurality of jet forming grooves therein, the upper ends of said grooves terminating within the outwardly and downwardly rounding wall area, a circular button which is substantially larger in diameter than said circular opening and which has a flat inner face, means attached to the button and projecting through the circular opening into the water passageway, mount means within the passageway mounting the last named means such that the button is free to shift both longitudinally and laterally with respect to said circular opening, and a spring associated with the mount means urging said button into tight interfacial engagement with the flat annular wall area surrounding the central opening, whereby water issuing from said passageway must force the button away from the flat annular

wall area and pass between the flat annular wall area and the flat inner surface of the button to impinge upon the outwardly and downwardly rounding wall area in the form of a radiating sheet which is broken into spray jets by the jet forming grooves in the conical section, and whereby said button can shift sideways to radially equalize flow passing between its flat inner surface and said flat annular area.

3. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said opening to provide a flat annular wall area immediately surrounding said opening which is normal to the axis of said opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said flat annular wall area, said flat annular wall area having a plurality of minute grooves in it which radiate from said circular opening, said outwardly and downwardly rounding wall area terminating in a spray section which flares to an outer rim for the shower head, a circular button which is substantially equal in diameter to said flat annular wall area and which has a flat inner face, means to mount said button such that said flat inner face resides adjacent to said flat annular wall area, whereby water issuing from the passageway must pass between the button and the flat annular wall area to impinge upon said outwardly and downwardly rounding wall area in the form of a radiating sheet.

4. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said opening to provide a flat annular wall area immediately surrounding said opening which is normal to the axis of said opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said flat annular wall area, the latter outwardly and downwardly rounding wall area terminating in a spray section which flares to an outer rim for the shower head, said spray section having a plurality of spray forming grooves in it, the upper ends of said grooves being in said outwardly and downwardly rounding wall area, said flat annular wall area immediately surrounding said circular opening having a plurality of minute grooves in it which radiate from the opening, each minute groove being aligned with a spray forming groove in the spray section, a circular button which is substantially equal in diameter to said flat annular wall area and which has a flat inner face, means to mount said button such that said flat inner face resides adjacent to said flat annular wall area, whereby water issuing from the passageway must pass between the button and the flat annular wall area to impinge upon said outwardly and downwardly rounding wall area in the form of a radiating sheet, said radiating sheet of water impinging upon said outwardly and downwardly rounding wall area being broken into individual spray jets upon entering said grooves.

5. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said opening to provide a flat annular wall area immediately surrounding said opening which is normal to the axis of said opening and to provide an outwardly and downwardly rounding

internal wall area immediately surrounding said flat annular wall area, the latter outwardly and downwardly rounding wall area terminating in a spray section which flares to an outer rim for the shower head, said spray section having a plurality of spray forming grooves in it, the upper ends of said grooves being in said downwardly and outwardly rounding wall area, said spray forming grooves being substantially V-shaped in cross section, the sides of said V-shaped grooves being angulated differently from one groove to the next, a circular button which is substantially equal in diameter to said flat annular wall area and which has a flat inner face, means to mount said button such that said flat inner face resides adjacent to said flat annular wall area, whereby water issuing from the passageway must pass between the button and the flat annular wall area to impinge upon said outwardly and downwardly rounding wall area in the form of a radiating sheet, said radiating sheet of water impinging upon said outwardly and downwardly rounding wall area being broken into individual spray jets upon entering said grooves.

6. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said opening to provide an annular wall area immediately surrounding said opening the axis of which is normal to said opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said annular wall area, the latter outwardly and downwardly rounding wall area terminating in a spray section which flares to an outer rim for the shower head, a circular button having an inner face, yieldable means mounting said button such that said inner face normally resides in facial contact with said annular wall area, whereby water issuing from said passageway acts upon said button to displace the inner face of said button from said annular wall area and passes between said face and said annular wall area to impinge upon said outwardly and downwardly rounding wall area in the form of a radiating sheet, said yieldable means permitting sideways shifting movement of the button so that said button can adjust itself to radially

equalize the flow of water between its inner face and said annular area.

7. A shower head as set forth in claim 6 in which the spray section has a plurality of spray forming grooves in it, the upper ends of said grooves being in the outwardly and downwardly rounding wall area such that the radiating sheet of water impinging on said outwardly and downwardly rounding wall area is broken into individual spray jets upon entering said grooves.

8. A shower head comprising a diffuser, means to attach said diffuser to a water outlet, said diffuser configured internally in the upper part thereof to provide a passageway for water issuing from said outlet, said passageway terminating inside of the diffuser at a circular opening providing an outlet for said passageway, said diffuser configured internally below said opening to provide a flat annular wall area immediately surrounding said opening the axis of which is normal to said opening and to provide an outwardly and downwardly rounding internal wall area immediately surrounding said flat annular wall area, a circular button which is substantially larger than said circular opening and which has a flat inner face, and yieldable means mounting said button such that said flat inner face normally resides in facial contact with said flat annular wall area, whereby water issuing from said passageway acts upon said button to displace the flat inner face of said button from said flat annular wall area and passes between said face and said flat annular wall area to impinge upon said outwardly and downwardly rounding wall area in the form of a radiating sheet, said yieldable means permitting sideways shifting movement of the button so that said button can adjust itself to radially equalize the flow of water between its inner face and said flat annular area.

References Cited in the file of this patent

UNITED STATES PATENTS

2,012,623	Boyd	Aug. 27, 1935
2,044,445	Price et al.	June 16, 1936
2,164,411	Kennedy	July 4, 1939
2,303,478	McLean	Dec. 1, 1942
2,348,776	Bentley	May 16, 1944

FOREIGN PATENTS

125,065	Switzerland	Mar. 16, 1928
504,875	Great Britain	May 2, 1939