May 16, 1944. C. H. BENTLEY 2,348,776

SHOWER HEAD

Filed April 25, 1941

Fig. 1.

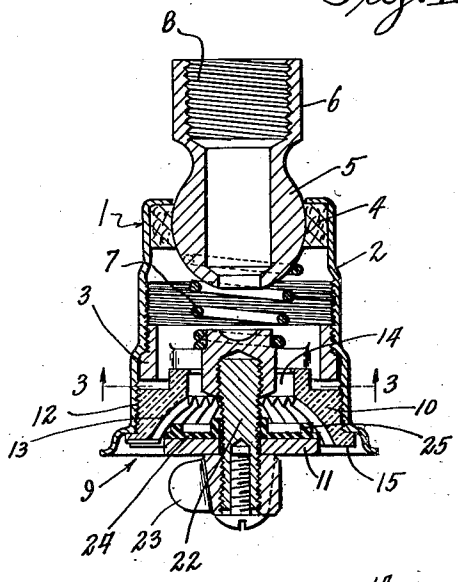


Fig. 3.

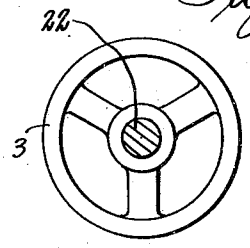


Fig. 4.

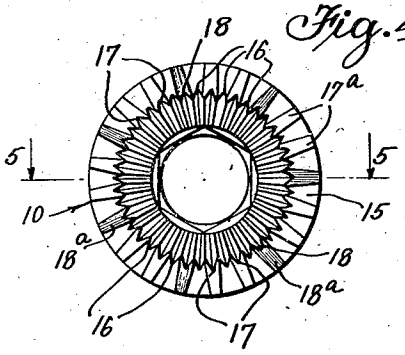


Fig. 5.

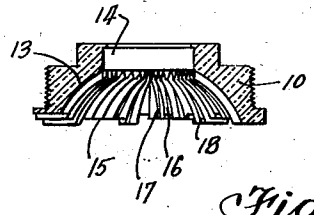
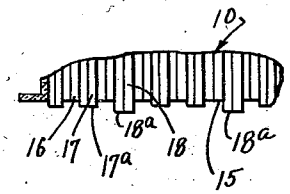


Fig. 6.



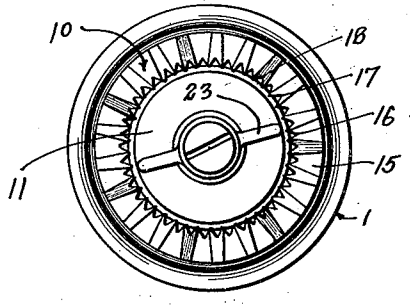


Fig. 2.

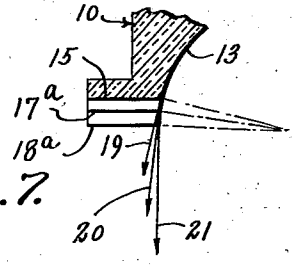


Fig. 7.

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UNITED STATES PATENT OFFICE

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SHOWER HEAD

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Application April 25, 1941, Serial No. 390,323

5 Claims. (Cl. 299—141)

This invention relates to shower heads and more particularly to a shower head having means to disperse the spray to produce a shower spray through which the water is more evenly distributed.

In the construction of a shower head, particularly those applicable for use in installations where it is desired to maintain a restricted flow of water as, for example, in shower installations over tubs, considerable effort has been expended in the effort to provide a shower head which will produce a spray of a confined character, the center area of which is substantially uniformly filled. In the effort to produce a spray of this character, it has been suggested that there be used a spray diverter member including a plurality of grooves or channels, each of which has a different angularity related to the direction of flow of water so that the water emitting from such channels has a different direction of travel. This type of construction has not proven economically feasible because of the expense incident to the forming of the differently directed channels and to the fact that such channels or grooves are subject to clogging and liming.

It is therefore an object of this invention to produce a shower head particularly applicable for use but not confined to use in limited spaces and which includes a spray diverter member mounted in the path of flow of the water and adapted to divide the water flow into separate streams emitted from the shower head at different angles of emission due to determination of the channels at different points along the arc of the curved path defined by the channels.

Another object of this invention is to provide a shower head diverter member formed to provide a multiplicity of curved channels following substantially the curvature of a segment of a sphere and which channels are terminated at varying distances along the said curvature.

Other objects and advantages of this invention it is believed will be apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawing.

In the drawing:

Figure 1 is a sectional elevation shower head embodying my invention.

Figure 2 is an end plan view thereof.

Figure 3 is an end view of the spider ring incorporated in the shower head embodying my invention.

Figure 4 is a plan view of the spray diverter insert embodying my invention.

Figure 5 is a sectional edge view taken substantially on the line 5—5 of Figure 4.

Figure 6 is a fragmental enlarged development of the spray diverter insert of Figure 4.

Figure 7 is a diagrammatic fragmental view illustrating the spray dispersion from the spray diverter insert embodying my invention.

In the preferred embodiment of my invention as illustrated in the accompanying drawing, 1 indicates a shower head body which may be of any suitable or desirable construction and is herein illustrated as including a shell 2 in which there is mounted a spider 3 for maintaining a watertight connection between the packing ring 4 and the supporting spherical section 5 of the connecting member 6.

A spring 7 is interposed between the spider 3 and the spherical section 5 which permits universal movement of the body 1 around the sphere 5 but maintains the packing 4 in fluid-tight contact with the periphery of the spherical section 5. The spider 3 is threaded into the body 1. Water enters the body 1 through the connector 6 through a water passage 8 and passes through the spider 3 in a direction generally longitudinal with relation to the body 1. Interposed in this water passage is a spray diverter 9 which includes a spray diverter member 10 and a spray confining disc 11. The spray diverter member 10 is threaded to the body 1 as indicated at 12.

The spray diverter member 10 may be of any suitable or desirable material, but is preferably formed of a material which is of a non-liming character. Such materials I have discovered to be materials like rubber (hard or soft) or Bakelite or a plastic material formed of one of the plastics to which lime does not adhere. The spray diverter member 10 is preferably of relatively rigid construction and is formed on its inner surface curved substantially as the segment of a sphere, as indicated at 13. This inner surface is grooved to provide a multiplicity of substantially V cross-section grooves which follow the curvature of the inner surface and diverge outwardly from the centrally disposed water inlet 14 to the face 15 of the diverter member 10.

The V-shaped grooves thus formed are divided into a multiplicity of classes which I have indicated as the V-shaped channels 16, 17 and 18, and these channels are cut off or terminate on the arc of the spherical section at different distances from what I prefer to refer to as the equatorial plane of the sphere of which the section 13 is a portion.

As indicated in Figure 7, the channels 16 terminate at the greatest distance from the said equatorial plane so that the tangent indicated by the line 19 to the curve at this point diverges outwardly from the horizontal axis of the body at an angle which may be, for example, an angle of 4°. The channels 17 terminate on the face 15 at a lesser distance from the said equatorial plane, as indicated at 17a so that the tangent to the curve as indicated by the line 20 at this point diverges outwardly from the axis of the body 1 at a lesser angle, say of 1° or 2°.

The channels 18 terminate on the face 15 at a point near to the equatorial plane as indicated at 18a so that the tangent indicated by the line 21 to the curve at this point of termination is more nearly parallel to the longitudinal axis of the body 1, or may even be carried beyond the equatorial plane so that it would converge toward the axis. In this way, by merely cutting off the channels 16, 17 and 18, at the desired distances from the mid or equatorial plane of the spherical section, any desired degree of distribution of the sprays of water emitting from the shower head may be had.

In this particular case I have found that it is advantageous to have the said channels formed in somewhat the following relationship. There are seven channels 18, that is, channels which terminate more nearly upon the equatorial plane or diverge or converge slightly therefrom. There are fourteen channels 17, the ends 17a of which terminate on the face 15 at a distance from the equatorial plane which will give a divergence of their tangential lines 20 of from 1° to 2° from the axis of the body 1. There are twenty-one channels 16, the terminating ends of which are of the greatest distance from the equatorial plane and the point of the end faces determines the spread of the spray cone emitting from the head 1.

In order to confine the water issuing from the shower head to the channels 16, 17 and 18, there is provided the confining disc 11 which is mounted upon the central stud 22 carried by the spider 3. This disc is maintained in position by means of a wing nut 23 threaded upon the stud 22 in position to move the disc 11 inward along the curved segmental spherical surface 13. Carried on the inner face of the water-confining disc 11 is a soft rubber disc 24, the peripheral edges of which extend beyond the periphery of the confining disc 11 so that they may be forced into the channels 16, 17 and 18 and to thereby control the character of spray being emitted from the head 1. By cutting the channels to a smaller area, the fineness of the sprays is determined so that the spray is controlled as to the size of the drops or sprays being emitted. The soft rubber disc 24 is provided with a reinforcing flange 25 which lends rigidity to the otherwise soft rubber construction, enabling me to maintain the peripheral edge of the disc 24 in spray confining position.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. In a shower head, the combination of a body member, providing a water passage, a dished spray diverter member mounted in the body in the water passage, said spray diverter member having a water receiving inlet parallel to the axis of the body, said spray diverter member including a member formed of a non-liming material, having curved water channels formed in its inner dished surface segment, and a water confining member positioned with reference to the channeled member to confine flow in said channels, and the channels terminating at varying distances along the dished surface whereby water emitting from said channels leaves the same at angles relative to the axis of the head corresponding substantially with the tangency of the curve of the channels at their terminals.

2. In a shower head, the combination of a body member providing a water passage, a spray diverter mounted in the body in the water passage, said spray diverter including a diverter member having an inner surface substantially a segment of a sphere having water channels formed therein, said water channels terminating at varying distances at the face of the diverter member from the equatorial plane of the spherical segment, and a confining disc mounted within the curved segment to confine the water within the spray channels.

3. In a shower head, the combination of a body member providing a water passage, said body member having an inner curved surface, a spray diverter mounted in the body in the water passage and having its periphery related to the inner surface of the body so as to form with the body a multiplicity of curved water channels, and the said curved water channels being of varying lengths terminating at varying distances along the curved surface and from the plane including the end of the body member.

4. In a shower head, the combination of a body providing a water passage, a dished spray diverter mounted in the water passage and providing on its inner dished surface a multiplicity of curved water channels, the said water channels terminating at varying distances from the plane including the end of the dished diverter whereby water emitting from said channels will leave the diverter channels at varying angles corresponding substantially with the tangency of the curve of the dished diverter at the terminal of said channels, and a member mounted in the water passage to confine the flow of water to the channels.

5. In a shower head, the combination of a body member providing a water passage, a spray diverter mounted in the body in the water passage, said spray diverter including a diverter member having a detached inner surface with water channels formed therein, a disc member mounted within the diverter member to confine the water to said channels, and said water channels terminating at varying distances around the curve and from the plane including the end of the diverter member.

CLARENCE H. BENTLEY.