

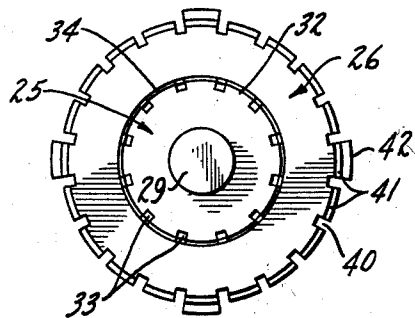
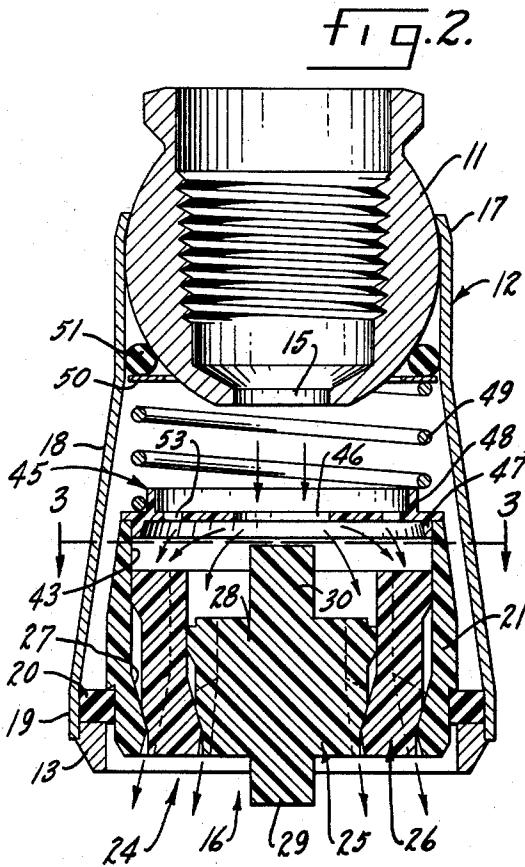
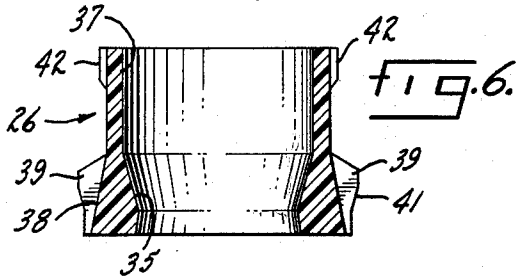
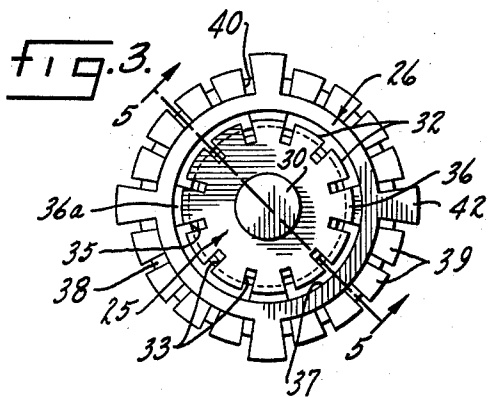
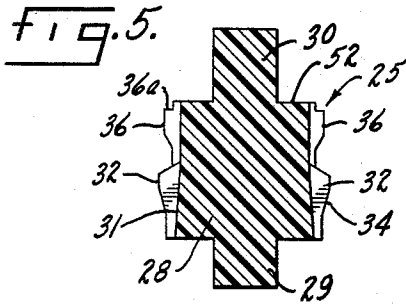
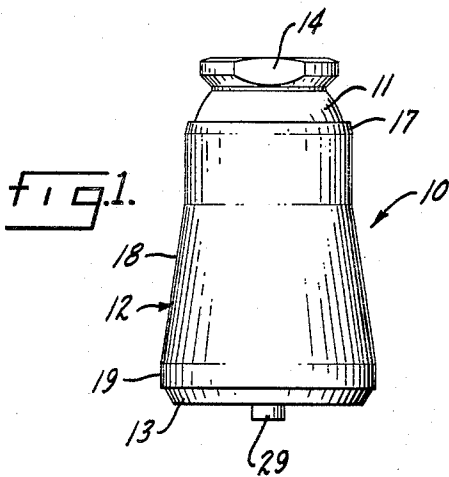
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SHOWER HEAD

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SHOWER HEAD

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This invention relates generally to shower heads, and specifically to a simple, relatively inexpensive shower head which can be quickly cleared of water borne sediment and other clogging material which tends to restrict water flow.

Accordingly, a primary object of the invention is to provide a rugged, simple, relatively inexpensive shower head.

Another object is to provide a shower head in which the spray apertures can be quickly and simply expanded in size without tools to enable any foreign matter which has lodged therein to be flushed out by water pressure.

Yet another object is to provide a shower head providing a uniform spray within a spray on low as well as high water pressures.

A further object is to provide a shower head in which the kinetic energy of the flowing water maintains a spray forming assembly in a seated, spray forming position.

Other objects and advantages of the invention will be apparent from a reading of the following description of the invention.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

FIGURE 1 is an elevation of the shower head;

FIGURE 2 is a sectional view, to an enlarged scale, through the shower head of FIGURE 1;

FIGURE 3 is a view taken substantially along the line 3-3 of FIGURE 2;

FIGURE 4 is a bottom plan view of the inner and outer spray formers;

FIGURE 5 is a section taken substantially along the line 5-5 of FIGURE 3 illustrating particularly the inner spray former; and

FIGURE 6 is a section taken substantially along the line 5-5 of FIGURE 3 illustrating particularly the outer spray former.

Like reference numerals will be used to refer to like parts throughout the following description of the drawings.

Referring first to FIGURE 1, the shower head is indicated generally at 10. Visible portions include a conventional ball connection 11, a body or casing 12, a terminal ring 13, and a flushing button 29. The ball may have a pair of oppositely located milled flats 14 for ease of installation and removal from a water inlet pipe.

Although the ball has been illustrated in both FIGURES 1 and 2, it is not an integral part of the invention. The casing 12 and spray forming mechanism within it may be manufactured and sold with or without the ball valve, the ball valve always performing its usual function of a connector which enables the body, and spray mechanism, to be tilted at an angle with respect to the water inlet pipe.

Referring now to FIGURE 2, the water inlet to the casing is indicated generally at 15 and the outlet at 16. In this instance the upper end of the body has been crimped against the ball valve as at 17 to enable the axis of the casing to be tilted from the axis of the ball at the option of the user. The body includes a downwardly diverging section 18 which terminates in a generally cylindrical portion 19. The terminal ring 13 is secured to the lower end of the cylindrical portion 19, in this case by a press fit. Within the scope of the invention any suitable securing means may be employed, but the press fit is preferred. The upper surface of the terminal ring 13 provides a shoulder against which retaining ring 20 is seated.

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The retaining ring is formed of a material having the characteristics as to flexure and compressibility of rubber and provides a seal between the casing 12 and seat 21.

A spray forming assembly is indicated generally at 24. The assembly consists essentially of an inner spray former 25 and an outer spray former 26, which, when in engagement with one another, and with the guiding and positioning member or seat 21, form a pair of generally concentric rings of water jet apertures.

The inner spray member 25 comprises a body section 28 from which a flushing member or button 29 and a flow diverter 30 extend. In this instance the button 29 and flow diverter 30 are generally centrally aligned with the longitudinal axis of the inner spray former and thereby the longitudinal axis of the shower head.

The lower periphery of the inner spray former diverges outwardly downwardly in the area indicated at 31. A plurality of projections 32 which form grooves or notches 33 therebetween are located about the diverging portion 31. Projections 32 include abutment shoulders 34 which are formed at an angle complementary to an abutment section 35 on outer spray former 26. A plurality, in this instance four, guide shoes 36 extend upwardly to the top of body 28 as best seen in FIGURE 2. The shoes are in sliding engagement with the barrel portion 37 of the outer spray former 26 and are cut away as at 36a for a purpose which will appear hereinafter.

The outer spray former 26 similarly includes a downwardly outwardly diverging section 38 from which a plurality of spray forming projections 39 extend. The projections or teeth form a plurality of spray apertures 40. The teeth include an abutment shoulder 41, which, when the outer spray former is in its fully extended, seated position, rests against a complementary abutment shoulder 27 on seat 21. When the outer spray former is in the seated position of FIGURE 2, the notches 40, and seat 21 form an outer ring of spray apertures which is generally concentric with the inner ring of notches 33. A plurality of guiding shoes 42 extend outwardly from the upper portion of outer spray former 26. Each shoe slides along the barrel section 43 of seat member 21.

A spring or flow plate is indicated generally at 45. The plate consists essentially of a flat disc which has a central flow constricting aperture 46 generally aligned with the flow diverter 30. A downwardly extending seating flange 47 centers the spring plate on the spray dispersing assembly, and an upwardly extending flange 48 acts as a spring anchoring or stabilizing flange. In this instance a uniform diameter spring 49 has been illustrated, the lower end of which rests against the upper surface of spring plate 45, and the upper end of which bears against the lower surface of washer 50. A sealing gasket 51 composed of a material having the general characteristics as to flexure and compressibility of rubber is seated between the ball and housing 18. The gasket provides a seat for the spring washer and also acts as a seal for preventing leakage of water upwardly between the casing and ball.

The use and operation of the invention is as follows.

The normal, extended position of the shower head is illustrated at FIGURE 2. It will be understood that since the connection between the ball 11 and casing or body 12 is a sliding, twistable fit, the body can be oriented into any angular position with respect to the longitudinal axis of the ball connection 11.

The direction of water flow is indicated generally by the arrows in FIGURE 2. Rubber gasket 51 prevents leakage of water upwardly between the casing and ball valve, and the retaining ring 20 prevents leakage of water around the spray dispersing assembly 24. Since spring 49 compresses the spring plate 45 against the top of seat 27, all water flows through the flow constricting aper-

ture 46. Impingement of the water against the upper end of the diverter 30 seats inner spray former 25 against the outer spray former 26, and similarly the outer spray former against seat 27. The water then is diverted outwardly and downwardly through the inner and outer rings to provide a finely divided cone within a cone spray.

Should the spray apertures become clogged after use due to water borne sediment, the user merely moves the inner spray former upstream against the water flow by pressing on flushing button 29. This moves the inner spray former away from the outer spray former and in effect expands the spray apertures to a width sufficient to permit the water to flush away trapped sediment. The inner spray former may be moved freely upwardly until its top surface 52 strikes the underside of spring plate 45. From then on, upward movement is against the yielding force provided by spring 49. Similarly outer spray former 26 may be moved upwardly from stationary seat 21.

Under certain circumstances, particularly when high water pressure is available, additional apertures 53 are provided in the spring plate to prevent any pressure buildup in the casing when the spray dispersing assembly is depressed for flushing purposes. The cutaway sections 36a on the upper end of the extensions 36 of the inner spray former would then be substantially aligned with the auxiliary apertures 53 so that sufficient flow area is provided to enable the water to pass through the spring plate. In other words, under high water pressures, the diverter 30 when projected upwardly into aperture 46 may not provide enough flow clearance to avoid a pressure buildup in the casing.

Likewise, although a uniform diameter spring has been illustrated and described, it will be understood that within the scope of the invention springs of different sizes may be utilized. For example, an inverted frusto-conical spring may be employed. If such a spring is employed flange 48 may be placed outside it or perhaps even eliminated altogether. With such a spring, the lower end would be of such a dimension as to avoid overlapping auxiliary flushing holes 53 if they are used.

The spring plate or restricting member 47 ensures that the flow will always enter the spray forming assembly in the same direction regardless of the angle of the ball swivel position or the water pressure. The spring plate 45, inner and outer spray formers 25, 26, and seat 21 may all be formed of a molded plastic material having good dimensional stability when exposed to water, such as an acetal resin type material. One quite acceptable material is Delrin.

In view of the obvious variations which are possible from the foregoing exemplary description, it is my intention that the scope of my invention be measured not solely by the description but rather by the following claims as interpreted in light of the prior art, having due regard to the doctrine of equivalents.

I claim:

1. A shower head, said shower head including, in combination, a casing having a water inlet and a water outlet, a spray forming assembly reciprocable between an extended, spray forming position and a retracted flushing position, said spray forming assembly including, a generally centrally located freely mounted spray forming member, guiding and positioning structure for the spray forming assembly adjacent the water outlet, said spray forming assembly, when in engagement with the guiding and positioning structure, forming a plurality of downwardly diverging water jet apertures, yieldable limit means opposed to and resisting movement of the spray forming assembly as a whole towards its retracted position, a portion of said spray forming assembly being accessible to the user whereby a retracting force may be exerted against the spray forming member to move it out of its extended, seated position against the yieldable limit

means to thereby expand the jet apertures whereby water borne sediment lodged therein may be flushed out.

2. The shower head of claim 1 further characterized in that the spray forming assembly comprises an inner, generally centrally located spray former freely reciprocable within an outer, generally annular spray former, the outer spray former being freely reciprocable within a generally cylindrical surface, the exterior of the inner spray former and the interior of the outer spray former, when in engagement, forming a first set of jet apertures, the exterior of the outer spray former, and the interior of the generally cylindrical surface forming a second set of jet apertures, said second set being generally concentric with the first set.

3. The shower head of claim 1 further characterized by and including a flow diverter generally centrally located with respect to the longitudinal axis of the casing in the path of water flow, and effective, when water flows therethrough, to divert it generally radially outwardly toward the jet apertures formed by the spray forming assembly and to maintain the spray formers in seated positions.

4. The shower head of claim 3 further characterized in that the flow diverter is carried by, and extends generally upwardly from, the upper end of the spray forming assembly.

5. The shower head of claim 1 further characterized by and including a depression member extending downwardly from the spray forming member which is effective, upon the application of the retracting force, to move the spray forming member out of its extended, seated position against the yieldable limit means to thereby expand the jet apertures whereby water borne sediment lodged therein may be flushed out.

6. In combination in a shower head, a hollow casing having an inlet and an outlet opening and a spray forming assembly movably positioned therein; means for retaining said assembly yieldingly in a downward position within said casing; said spray assembly comprising an outer sleeve-like member provided with a bore of reduced diameter adjacent its downstream end; and a pair of spray formers freely positioned within said sleeve-like member, one within the other, each of said spray forming members provided with a plurality of outward radial projections separated by outwardly flaring grooves, the outermost of said spray formers having its internal diameter reduced adjacent its downstream end; said inner spray former provided on its upper face with a diverter; the two spray formers being freely movable in the upstream direction with respect to each other and with respect to the sleeve-like member and a flow plate positioned on the sleeve-like member; and provided with a restricting perforation.

7. In combination in a shower head, a hollow casing having an inlet and an outlet opening and a spray forming assembly movably positioned therein; means for retaining said assembly yieldingly in a downstream position within said casing; said spray assembly comprising an outer sleeve-like member provided with a bore of reduced diameter adjacent its downstream end; and a pair of spray formers freely positioned within said sleeve-like member, one within the other, each of said spray forming members provided with a plurality of outward radial projections separated by outwardly flaring grooves, the outermost of said spray formers having its internal diameter reduced adjacent its downstream end; said inner spray former provided on its upper face with a diverter; the two spray formers being freely movable in the upstream direction with respect to each other and with respect to the sleeve-like member and a flow plate positioned on the sleeve-like member; and provided with a restricting perforation and spring means within the casing biased to hold the flow plate and the sleeve-like member in downward position.

8. In combination in a shower head, a spray forming device comprising a hollow outer casing and a spray forming assembly positioned within said casing; said assembly comprising an external sleeve, an interior spray forming

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ring within it and a spray forming plug within said ring; adjacent surfaces of said sleeve and said ring shaped to permit free upward relative movement and to limit downward relative movement; adjacent surfaces of said sleeve and ring and of said ring and plug shaped toward their downstream end to provide a plurality of outwardly flared water passage grooves, a water directing means positioned within said housing and closing said sleeve on its downstream end; said water directing member provided with an opening therethrough, said opening being centrally located; and spring means positioned within said housing and biased to hold said sleeve and said water directing member in a downward position.

9. In combination in a shower head, a hollow housing having an inlet and an outlet opening and a spray producing assembly movably positioned within said housing, means in said housing assembly adjacent its outlet end for retaining said assembly against outward displacement; said means comprising an inwardly projecting support secured to said housing and interfitting with a part of said assembly; said assembly comprising a sleeve provided with an external shoulder and with a portion of reduced

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diameter internally adjacent its outlet end and a ringlike member positioned within said sleeve and provided internally with a portion of reduced diameter adjacent one end; said ring provided with radial external vanes; said vanes provided adjacent their upper ends with outward extensions; said ring provided adjacent its downstream end with a plurality of radial projections separated by grooves; the inner surfaces of said grooves tapered outwardly; a spray forming plug positioned within said ring and provided with a portion generally extending in the downstream direction beyond said housing, said shell and said sleeve; said plug provided with radial vanes shaped to provide lateral extensions adjacent one end; said plug provided also with outward extensions separated by grooves, the inner surface of said grooves flared outwardly; said ring plug and sleeve being formed of acetal resin plastic.

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