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J. E. STOTT

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SHOWER HEAD NOZZLE

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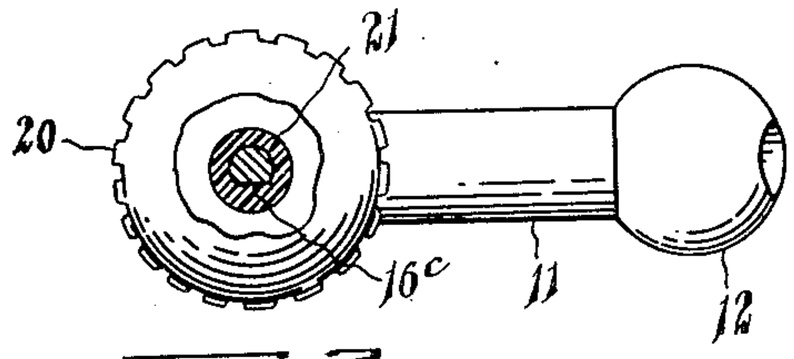

Fig. 3.

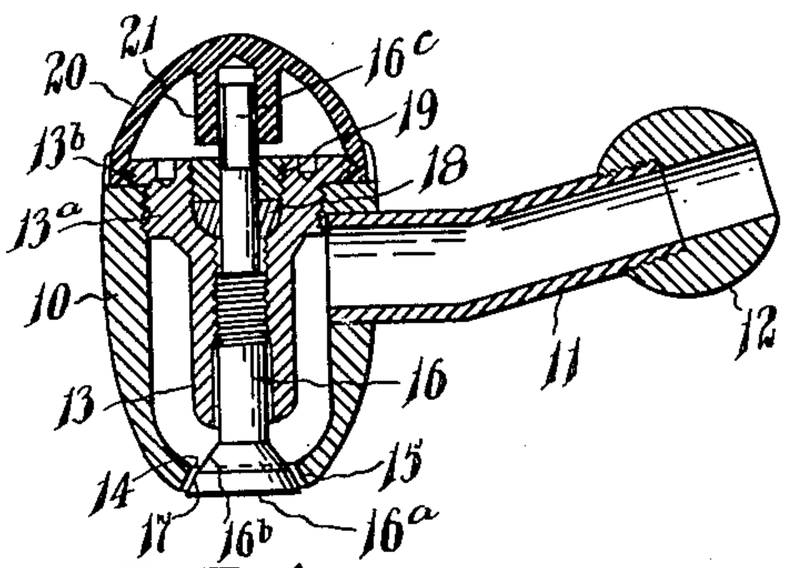

Fig. 1.

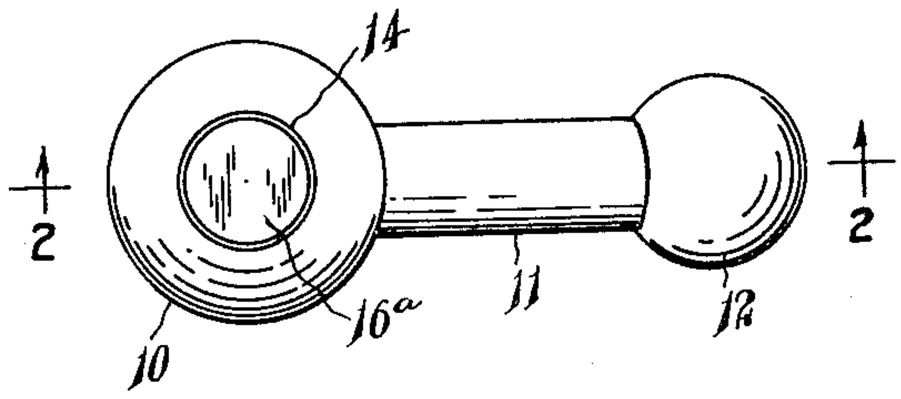

Fig. 2.

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SHOWER HEAD NOZZLE

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4 Claims. (Cl. 299—150)

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This invention relates to nozzles for delivering a spray, and more particularly to nozzles adapted for use as shower heads and embodying means for controlling the flow of water therefrom.

An object of this invention is to provide a shower head incorporating means to produce a conical spray of water, the thickness of which at the point of issue may be varied by a simple and efficient form of control. A hollow curtain of water of conical form is ideally adapted for the production of fine drops, which form when the film thickness of the conical curtain decreases, as a result of its increasing area, to the point where the surface tension fails to maintain a solid curtain. The invention therefore utilizes the hydraulic formation of drops to produce a fine spray, rather than employing mechanical means of breaking up the flow.

A further object of the invention is to provide a shower head by which the flow of water may be accurately controlled over a wide range, down to the point where the flow is shut off, without adversely affecting the character of the spray.

Still another object of the invention is to provide a shower head which may be controlled from a point which is above the spray and is consequently subject to easy access without the necessity for the user to come in contact with the spray while turning on or controlling the flow of water from the shower head.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in conjunction with the accompanying drawings, wherein like characters of reference indicate corresponding parts throughout the several views and wherein:

Fig. 1 is a vertical cross-sectional view of the shower head;

Fig. 2 is a bottom view looking toward the outlet; and

Fig. 3 is a top view, partly in section, showing the construction of the flow-adjusting cap.

The shower head illustrated comprises a casing 10 provided with an inlet pipe 11 which enters the side of the casing 10. Threaded on to the outer end of the inlet pipe 11 is an apertured ball 12 which is adapted to be received within the usual type of socket sleeve to allow adjustability of the shower head on a pipe leading from the water supply. The upper portion of the casing 10 is internally threaded to receive the enlarged upper portion 13a of a vertical sleeve 13. The upper portion 13a is of greater diameter than the sleeve 13 proper and is externally

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threaded to engage the internally threaded casing 10 so that the sleeve 13 extends axially downward and defines an annular flow channel within the casing.

The lower end of the casing 10 is provided with a circular outlet 14 having a divergingly tapered cone-forming annular surface 15, so shaped as to permit smooth, uninterrupted flow of water therethrough. The taper of the surface 15 is preferably such that the included angle is approximately 40°.

The sleeve 13 is internally threaded to receive a stem 16 which is externally threaded for a portion of its length and which is provided with a head 16a. The head 16a has a divergingly tapered annular surface 16b extending from the stem 16 to meet a divergingly tapered curtain-forming annular surface 17. The annular surface 17 faces the annular surface 15 in the outlet 14 and defines therewith an annular curtain-forming aperture.

A packing ring 18 within the sleeve 13 surrounds the stem 16 and is held in place by a packing gland nut 19 threaded into the upper portion 13a of the sleeve 13. Above the sleeve 13 the stem 16 is provided with a flat portion 16c, and the upper portion 13a of the sleeve 13 has an annular flange 13b which engages an inner groove on an adjusting cap 20. An inner sleeve 21, secured to the adjusting cap 20, is adapted to receive and to engage slidably but not rotatably the flattened upper portion 16c of the stem 16.

Control of the rate of flow and drop size is achieved by rotation of the adjusting cap 20 which causes the threaded stem 16 to be turned by the sleeve 21, and advances or retracts the stem in the sleeve 13. The size of the annular aperture between the tapered surface 15 of the outlet 14 and the tapered surface 17 on the head 16a may thereby be conveniently varied from a point where the surfaces 15 and 17 are in contact and the flow is shut-off to a predetermined maximum size. A conical curtain of water having any desired film thickness at the point of issue may therefore be obtained.

Since the size of drops produced by the breaking up of the water curtain as its area increases depends upon the film thickness of the curtain of water flowing between the tapered surfaces 15 and 17, it will be seen that the drop size may be conveniently varied over a wide range to achieve the desired type of spray. The location of the adjusting tap 20 is such that it may be easily

adjusted without the user coming in contact with the spray, when such is desired.

It is thought that the construction and use of the invention will be apparent from the above description of the various parts and their purpose. It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or the scope of the subjoined claims.

What I claim as my invention is:

1. A nozzle for shower heads and the like comprising, a casing formed with a water inlet in the side thereof and having an internally threaded upper portion, a water outlet in the lower end of the casing, an internally threaded sleeve disposed within the casing and defining with the said casing a flow channel, an externally threaded stem threaded within the sleeve and adapted to extend co-axially through the outlet, the said stem having an upper portion extending above the casing, a head on the lower end of the stem, and a flow-adjusting cap secured to the sleeve and slidably but not rotatably engaging the upper portion of the stem whereby the stem may be turned to achieve selected positions of axial adjustment of the head with respect to the outlet in the casing, one of the sleeves and the cap having an annular groove and the other having an annular rib rotatably engaging the annular groove.

2. A nozzle for shower heads and the like comprising, a casing formed with a water inlet in the side thereof and having an internally threaded upper portion, a water outlet in the lower end of the casing, an internally and externally threaded sleeve threaded within the upper portion of the casing and extending downwardly to define with the said casing an annular flow channel, the said sleeve having an annular outer rib at the top thereof, an externally threaded stem threaded within the sleeve and adapted to extend co-axially through the outlet, the said stem having a flattened upper portion extending above the casing, a head on the lower end of the stem, and a flow-adjusting cap having an inner annular groove near the periphery thereof rotatably engaging the outer rib on the sleeve, the said flow-adjusting cap slidably but not rotatably engaging the upper portion of the stem whereby the stem may be turned to achieve selected positions of axial adjustment of the head with respect to the outlet in the casing.

3. A nozzle for shower heads and the like comprising, a casing formed with a water inlet in the side thereof and having an internally threaded upper portion, a water outlet in the lower end of the casing, an internally and externally threaded sleeve threaded within the upper portion of the casing and extending downwardly to define with the said casing an annular flow channel, the said sleeve having an annular outer rib at the top thereof, an externally threaded stem threaded within the sleeve and adapted to extend co-axially through the outlet, the said stem having a flattened upper portion extending above the casing, a head on the lower end of the stem, and a flow-adjusting cap having an inner annular groove near the periphery thereof rotatably engaging the outer rib on the sleeve, the said flow-adjusting cap also having a central sleeve slidably but not rotatably engaging the upper portion of the stem whereby the stem may be turned to achieve selected positions of axial adjustment of the head with respect to the outlet in the casing.

4. A nozzle for shower heads and the like comprising, a casing formed with a water inlet in the side thereof and having an internally threaded upper portion, a water outlet in the lower end of the casing, an internally and externally threaded sleeve threaded within the upper portion of the casing and extending downwardly to define with the said casing an annular flow channel, the said sleeve having an annular outer rib at the top thereof, an externally threaded stem threaded within the sleeve and adapted to extend co-axially through the outlet, the said stem having a flattened upper portion extending above the casing, a head on the lower end of the stem, a flow-adjusting cap having an inner annular groove near the periphery thereof rotatably engaging the outer rib on the sleeve, and a vertical sleeve connected to the inside of the cap and having an inner flattened portion slidably engaging the upper portion of the stem whereby the stem may be turned to achieve selected positions of axial adjustment of the head with respect to the outlet in the casing.

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