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2,688,515

SELF-CLEANING SHOWER HEAD

Filed April 10, 1951

Fig. 1.

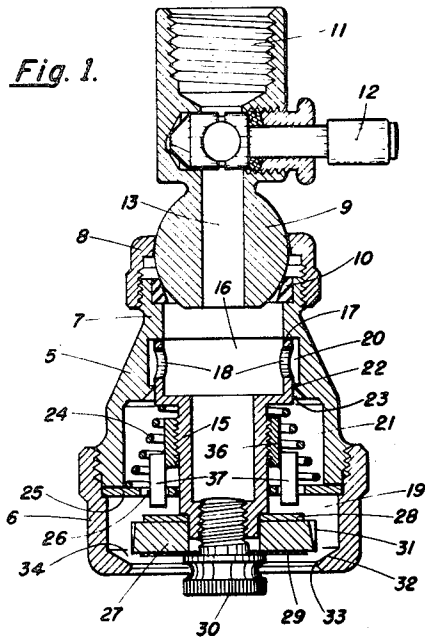


Fig. 2.

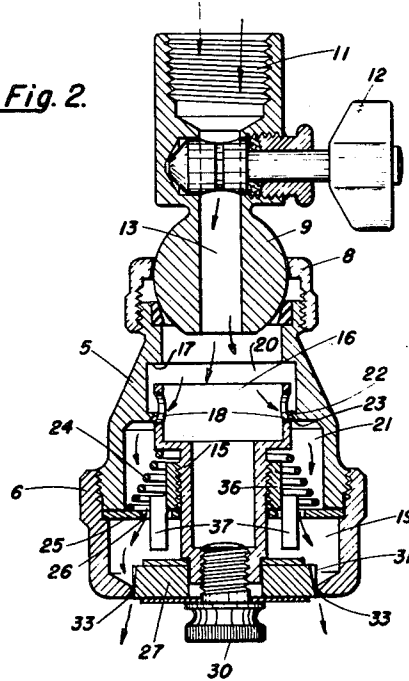


Fig. 5.

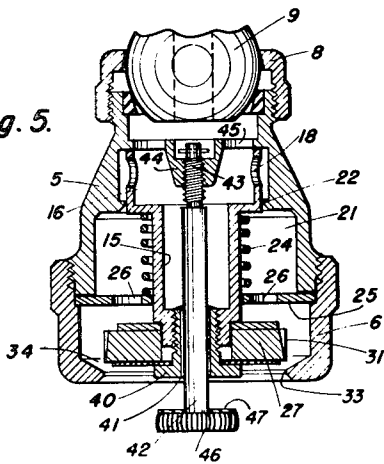


Fig. 6.

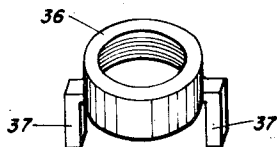
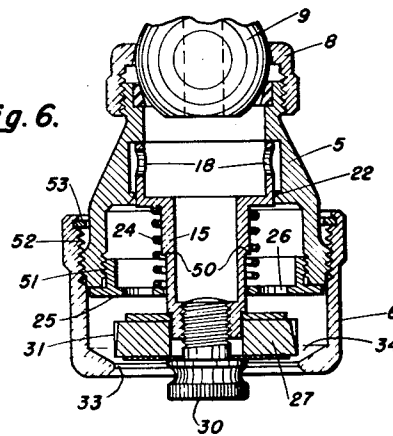


Fig. 4.

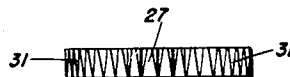


Fig. 3.

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SELF-CLEANING SHOWER HEAD

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7 Claims. (Cl. 299—59)

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The present invention relates to shower heads for use in shower baths and the like, and the principal object of the invention is to provide a new and improved shower head which is automatically self-cleaning in action.

Another object of the invention is to provide a new and improved self-cleaning shower head which is adjustable to vary the character of the spray emitted from the shower head.

Another object is to provide an automatic self-cleaning shower head having means for adjusting the character of the spray emitted from the discharge outlet together with means for regulating the water flow through the device in accordance with the adjusted setting.

A further object is to design a new and improved automatic self-cleaning shower head in which the adjustment for the desired spray pattern also automatically regulates the water flow through the shower head in accordance with the setting.

Further objects are to design a new and improved shower head which: automatically flushes out sediment from the shower head each time after it has been operated; provides a wide gap between the spray dispersing disc and the discharge outlet to prevent dribble of the water remaining in the head; prevents water flow through the head until the dispersing disc has moved into spray discharge position in said discharge outlet; is simple and durable in construction, efficient and reliable in operation, and eliminates constant maintenance and service.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, operation and combinations of elements which will be more fully described and pointed out hereinafter.

Referring now to the accompanying drawings in which:

Fig. 1 is a cross-sectional view through a shower head showing the invention;

Fig. 2 is a similar view showing the shower head operated with water flowing through the device;

Fig. 3 is a side view of the water dispersing disc;

Fig. 4 is a perspective of the adjustable stop, while

Figs. 5 and 6 are cross-sectional views of two different modified forms of the invention.

This invention is in the nature of an improvement on Patent No. 2,583,234, issued January 22, 1952, for Shower Heads by Irving H. Russell and William E. Sloan.

In most shower heads in use at the present time, there is provided either a manually operated handle on the casing or a knob on the water dis-

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persing disc, which is arranged so that the disc may be raised or lowered in the spray discharge outlet of the casing to regulate the character of jet discharge desired by the user, that is, he may prefer either a fine needle spray or a coarse spray. After the use of this type of shower head the handle or knob must be operated to lower or unscrew the water dispersing disc, so that a large gap is presented between the casing and the disc to permit the retained water to flush out of the shower head. In these prior shower heads, however, the accumulation of water borne lime deposits and sediment results in gradual unsatisfactory operation of the shower head, and often its total inoperativeness. This is so because it has been observed that the user of the shower head often neglects to fully open the shower head to flush it out after its use, so that eventually the jet discharge grooves become clogged up, necessitating frequent cleaning and maintenance and occasionally replacement of the entire shower head.

By the use of an automatic self-cleaning shower head, as described in the foregoing Patent No. 2,583,234, issued January 22, 1952, the foregoing difficulties are entirely obviated. In this type of shower head, the accumulated water is instantly discharged when the shower head is turned off, thereby flushing out the head and preventing any accumulated water from remaining in it and gradually drying up in the shower head to deposit sediment in the casing. This action at the same time eliminates the usual annoying dribble caused by previous shower heads. In this shower head the construction is such that only one type of spray is produced and no provisions are made for varying the spray discharge characteristics in accordance with the desires of the user. The present invention is directed to a shower head of the aforesaid type automatically self-cleaning in action and includes in combination the improvement in providing a novel means for adjusting the type or character of the spray discharge according to the wishes of the user.

Referring now particularly to Fig. 1 of the drawings, this discloses a preferred embodiment of the invention suitable for installation in a shower stall or above a bath tub in the customary manner. The shower head comprises a bell-shaped body or casing 5 having an end cap 6 threaded on the open end thereof. At the upper end, the casing 5 has a neck portion 7, upon which a coupling nut 8 is threaded, for the purpose of holding a universal or ball joint 9 against suitable packing 10 to provide a universal joint, so that the shower head can be

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swung in any direction in accordance with the desires of the user. A threaded nipple 11, preferably formed integral with the ball 9, is provided with a manually operated throttle valve in the side thereof, so that the water flow into the shower head may be regulated to compensate for various water supply pressures. The nipple 11 and ball 9 are also provided with an internal water passage 13 extending into the shower head casing 5.

Arranged axially within the shower head casing 5 is a hollow supporting stem 15, having an enlarged cup-shaped portion 16 at its upper end, the rim or edge portion of which is adapted for abutting engagement against a shoulder 17 formed in the upper end of the casing 5. Arranged on opposite side walls of the stem cup 16 are openings or passages 18, which serve to pass the water from the stem cup 16 into an upper chamber 20 formed in the casing. The lower enlarged end of the casing 5 comprises a chamber 21 through the center of which the lower end of stem 15 projects. The cup-shaped end 16 of stem 15 has slidable engagement with a projecting ring 22 formed in the casing 5 at the junction of the upper chamber 20 and lower chamber 21. This ring portion 22 provides a close fit, as indicated at 23, for guiding the upper end of stem 15 in its reciprocating movement. A spiral-shaped compression spring 24 encircles the stem 15 and normally urges the stem and its cup-shaped end 16 upwardly into engagement with the shoulder 17.

At its lower end, compression spring 24 bears against the top side of a guiding and stop plate 25 arranged across the open end of casing 5 and clamped solidly into position on the casing end by the threaded cap 6 as shown. Plate 25 has a series of orifices 26 arranged around the stem 15 for passage of water, which are of a greater area than the openings 18 in the top of stem 15. The stem 15 slidably protrudes through a central opening in the stop plate 25, which also serves to guide the stem in its movements, as shown. At the lower end of stem 15, a water dispersing disc 27 is supported, being clamped to the end of the stem between a pair of washers 28 and 29 by the adjusting screw and knob 30. This water dispersing disc 27 may be constructed of metal, but is preferably a synthetic or plastic product having the properties of inhibiting the formation of lime deposits thereon, and thereby prevent clogging of the disc. The periphery of the water dispersing disc 27, as is most clearly seen in Fig. 3, is provided with a series of grooves 31 tapering upwardly from the bottom of the disc.

In the normal position of the shower head, as shown in Fig. 1, a relatively large opening or gap 34 is present between the disc grooves 31 and the end surface 32 of cap 6. This large opening permits the instant discharge of any accumulated water which may be present in the interior of the body 5 after the water supply has been turned off by the user, so that no dribble takes place. This gap likewise serves to flush out any sediment that may have accumulated during the use of the shower head.

The means for adjusting the character or type of spray desired by the user includes a collar or stop member 36, more clearly seen in Fig. 4, which is internally threaded for movement up and down on the threaded outside diameter of stem 15. Extending from the bottom end of the stop member 36 is a pair of oppositely disposed

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prongs 37, normally and loosely positioned within two of the water passages 26 in the stop plate 25. By rotating the disc knob 30, the stop member 36 is threaded and moved either up or down on the stem 15 to variably position the stop with respect to the stop plate 25. The purpose of the prongs 37 is to hold the stop member 36 from turning while the stem 15 is being rotated by knob 30, so that an adjustment can be made.

Referring now particularly to the hydraulic operated position of the shower head as shown in Fig. 2, the flow regulating valve 12 may be turned open to any degree by the user of the shower head, and the hot and cold water inlet valves, which are not shown, are opened to admit the proper selected mixture of hot and cold water. This mixed water of the desired temperature flows through the nipple inlet 11, passage 13 and into the upper chamber 20 of the casing 5. Since this chamber is blocked at this time, as in Fig. 1, by the cup-shaped portion 16 of the stem 15, no water can flow through the shower head until the pressure has built up sufficiently to overcome the tension stored in spring 24. When this occurs, the supporting stem 15 is driven downward guided by the ring portion 22 of casing 5 and stop plate 25. The water dispersing disc 27 at the same time is moved to a position where it is in water dispersing engagement with the cap 6, so that the edges of the grooves 31 of disc 27 are opposite the edge 33 of the cap 6, thereby forming a series of small discharge openings through which the water is discharged. The outward movement of the disc 27, and therefore stem 15, is limited by the engagement of the lower end of stop collar 36 with the stop plate 25, the prongs 37 projecting a further distance through the water passages 26. In this position, likewise, the orifices 18 at the upper end 16 of stem 15 will be slightly in registry with the ring portion 22, or above the midpoint between the upper chamber 20 and lower chamber 21. Thereby communication is established for water flow to take place between these two chambers.

It will be observed that this water flow through the shower head can only occur when the water dispersing disc 27 is in spray discharge engagement with the annular opening 33 in cap 6. The complete passage of water can now take place over a path extending through passage 13, openings 18, chambers 20 and 21, openings 26 in stop plate 25, and out of the spray discharge openings provided between the grooves 31 and the edge 33 of cap 6.

In the position of the water dispersing disc 27, as shown in Fig. 2, a relatively fine spray will be discharged. In the event that the user of the shower head desires a coarser spray, he will merely reach up and turn the knob 30 in a counter-clockwise direction, so that the stem 15 is rotated or screwed downward in the stop member 36, which is held from rotating by the prongs 37. This adjustment will move the water dispersing disc 27 a certain amount downward, so that the wider portion of the inclined grooves 31 will be presented in spray discharge engagement with the edge 33 of cap 6, providing a coarser spray.

When the user of the shower head has turned off the water, pressure is no longer exerted against the upper portion 16 of the stem 15, and as a result, the spring 24 having been under compression, is free to exert its stored up energy against

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the stem 15, forcing it to its normal upward position against the shoulder 17 to the position shown in Fig. 1. This action, of course, carries along the water dispersing disc 27, which thereby moves out of spray discharge engagement with the cap 6, resulting in the provision of a relatively large gap 34, which permits the accumulated water within the shower head to be instantly discharged without any prolonged dripping action, and at the same time flushes out any dirt or sediment which may have accumulated in the shower head during its use. Since no water can remain in the shower head to be eventually dried up during long periods of disuse, and to deposit impurities in the grooves of the shower disc, no clogging action can ever take place. The foregoing action takes place each time that water to the shower head is turned on and off, and it will be observed it is entirely automatic, except for selecting the desired adjustment of the spray discharge by the user.

It will be apparent that the water dispersing disc 27, when adjusted to provide a fine spray, as shown in Fig. 2, would require a lesser amount of water for the needle spray than would be necessary when an adjustment is made for a coarse spray as where the disc 27 is stopped further outward through the cap 6, so that the wider portions of the groove 31 are positioned opposite the cap. The invention automatically compensates for the different water flows desired by the openings 18 in the upper end of stem 15 being positioned to present either a smaller or a larger area or portion of the openings opposite the ring portion 22 of casing 5. In the position shown in Fig. 2, where a fine spray is to be emitted, a lesser area of the openings 18 is presented opposite the ring 22, cutting down the flow of water through the shower head.

Referring now to the modification as disclosed in Fig. 5, the principal elements are the same as those disclosed in the device of Fig. 1, except that the adjustment for the spray characteristics comprises a hollow nut 40 similar to the adjusting screw 30 of Fig. 1, which is threaded into the end of stem 15, and has an axial opening 41 through it, through which an adjusting stem 42 is slidably positioned. The adjusting stem 42 at its upper end 43 is threaded into a partition 44 formed across the inlet opening in the casing 5. There are a series of water passages 45 formed in the partition 44 for permitting water to pass into the upper end 16 of the stem 15. At its lower end, the adjusting nut 42 is provided with a manually adjustable knob 46, on top of which there is a rubber washer 47 for cushioning the stopping position of the nut 40 and also to provide a seal for the opening 41 around stem 42. In the operation of this modification, the water pressure projects the stem 15 downward so that the disc 27 is in position opposite the edge 33 of cap 6 where the desired spray discharge is emitted. To provide either a fine or a coarse spray, the knob 46 may be screwed in either direction to vary the stopping position of the nut 40 with respect to the rubber washer 47, thereby stopping the disc 27 at the selected point.

Referring now to the modification shown in Fig. 6, in this arrangement the adjustment is provided not by the knob 30, but by the cap 6. The stem 15 is provided with a shoulder portion 50 which is adapted to contact the stop plate 25 whenever water flow takes place through the shower head and the disc 27 is projected into

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spray discharge engagement with the edge portion 33 of cap 6. The stop plate 25 is supported as by being threaded, as indicated at 51, into the internal diameter of the casing 5. The internal thread 52 of the cap 6 is somewhat extended to overlap the casing 5 to provide a certain margin of adjustment of the cap 6 either upward or downward. To prevent leakage between the cap 6 and casing 5, a rubber ring 53 may be recessed near the end rim portion of the cap 6. It will be obvious that in the operation of this arrangement the shoulder 50 encountering the stop plate 25 limits the movement of the dispersing disc 27 always to the same fixed distance. However, in order to vary the spray characteristic, it is merely necessary that the cap 6 be grasped by the user and manually rotated either upwardly or downwardly on its threads 52 with respect to casing 55, so that the position of the grooves 31 in disc 27 may be varied with respect to the edge 33 of cap 6.

The invention having been described more or less specific as to its details, including the modifications thereof, it is to be understood that the same is not to be limited thereby, as various changes may be made in the arrangement and proportion of the parts thereof and elements, and that equivalents may be substituted therefor, all without departing from the spirit or scope of the invention, as set forth in the appended claims.

What is claimed is:

1. In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a movable water dispersing disc arranged for axial reciprocating movement in said casing, means for normally holding said dispersing disc out of spray discharge engagement with said discharge outlet to provide a wide gap for draining said casing, means on said dispersing disc responsive to water flow through said casing for moving said dispersing disc into spray discharge engagement with said discharge outlet, means movable with said dispersing disc and cooperating with said casing for stopping the movement of said dispersing disc to cause a spray discharge to be emitted from said discharge outlet having a certain definite characteristic, and adjusting means on said dispersing disc for manually adjusting the stopping position of the same to vary the character of the spray discharge emitted.

2. In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a water dispersing disc arranged for reciprocal movement in said casing, spring means in said casing for normally holding said dispersing disc out of spray discharge relationship with respect to said discharge outlet, said casing having a water pressure chamber therein and pressure responsive means in said chamber attached to said dispersing disc for moving said dispersing disc against the tension of said spring means whenever water flows into said shower head, means on said pressure responsive means for permitting a spray discharge to be emitted from said discharge outlet only after said dispersing disc has been moved into spray discharge relationship with said discharge outlet, stop means carried along with said dispersing disc for limiting the operating movement of said dispersing disc to regulate the relationship of the dispersing disc with respect to the discharge outlet to produce a definite spray discharge, said stop means being adjustable to vary the character of the spray discharge.

3: In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a water dispersing disc in said casing, a supporting stem in said casing for supporting said disc in a position normally out of spray discharge engagement with said discharge outlet, water pressure responsive means on said stem for moving said stem whenever water flows into said casing, said disc thereby being moved into spray discharge engagement with said discharge outlet, spring means on said stem for restoring said stem and disc when water flow through said casing ceases, a stop member on said stem for limiting the movement of said dispersing disc to thereby cause a certain spray discharge to be emitted between said disc and said discharge outlet, said stop member being adjustable on said stem to thereby variably position said disc with respect to said discharge outlet, and means on said disc manually accessible for adjusting said stop member.

4. In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a water dispersing disc in said casing, a supporting stem in said casing for supporting said disc in a position normally out of spray discharge engagement with said discharge outlet, water pressure responsive means on said stem for moving said stem whenever water flows into said casing, said disc thereby moved into spray discharge engagement with said discharge outlet, said water pressure responsive means comprising a cup-shaped pressure member arranged within a pressure chamber in said casing and on the opposite end of said stem from said disc, said cup-shaped pressure member also being on the inlet supply side of said casing, a stop plate in said casing, a spring on said stem between said stop plate and said cup-shaped pressure member for restoring said disc and stem when water flow through said casing ceases, an adjustable stop member on said stem engageable with said stop plate for limiting the movement of said disc to thereby cause a certain definite spray pattern to be emitted from between the disc and discharge outlet, and a manual adjustable means on said disc for adjusting said stop member on said stem to variably position said disc with respect to said discharge outlet to thereby vary the spray pattern emitted.

5. In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a water dispersing disc in said casing, a supporting stem in said casing for supporting said disc in a position normally out of spray discharge engagement with said discharge outlet, a stop plate in said casing having a series of water passage openings therein, a stop member threaded on said stem and adjustable therewith to variably engage said stop plate, water pressure responsive means for moving said stem and thereby said disc into spray discharge engagement with said discharge outlet, an adjusting knob on said disc for adjusting the position of said stop member on said stem with respect to said stop plate whereby the spray discharge engagement of said disc with respect to said discharge outlet is varied to change the spray discharge characteristics, said stop member having prongs engaging the water passage openings in said stop plate for holding the stop member while the stem is being adjusted to prevent turning of the stop member, and a spring on said stem for normally holding said stop member away

from said stop plate while said prongs remain in said water passage.

6: In an automatic self-cleaning shower head, a casing having a water supply inlet and a discharge outlet therein, a movable water dispersing disc in said casing opposite said discharge outlet, a supporting stem in said casing supporting said disc on one end thereof, a spring on said stem for normally holding said disc in spaced relationship to said discharge outlet, co-operating stop means on said casing and said stem for limiting the movement of said stem and therefore said disc, means on said disc for adjusting the stop means to vary the stopping position of said disc with respect to said discharge outlet to vary the spray discharge characteristics, a cup-shaped member on the opposite end of said stem from said disc, said casing having a pressure chamber therein in which said cup-shaped member is slidably positioned, said cup-shaped member responsive to water pressure in said pressure chamber to move outward therefrom to cause movement of said stem, said cup-shaped member having water passages therein so arranged in said pressure chamber that water flow from said supply inlet to said discharge outlet cannot take place until said disc has been moved to its predetermined adjusted stopping position with relation to said discharge outlet.

7: In an automatic self-cleaning shower head, a casing having a water supply inlet and a spray discharge outlet therein, a movable water dispersing disc in said casing, a stem supporting said disc on one end and having a cup-shaped pressure responsive member on the other end thereof, a pressure chamber in said casing in which said pressure member is slidably positioned, means on said stem for normally holding said disc in spaced relationship to said discharge outlet, the water pressure in said chamber being effective to move said pressure member and therefore said disc into spray discharge relationship with said discharge outlet, means for adjustably stopping the movement of said disc to vary the spaced relationship between said disc and said discharge outlet to produce a variable spray discharge ranging from a fine stream to a coarse stream discharge, there being water passages in said pressure responsive member so arranged with respect to said pressure chamber that water flow cannot take place from said discharge outlet until said disc is in spray discharge relationship with said discharge outlet, said water passages also being so arranged in said pressure chamber that a variable water flow takes place through said water passage and said pressure chamber depending upon the adjusted stopping position of said disc, whereby for various spray discharges ranging from fine to coarse streams a proportionate water flow takes place through said casing.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,758,119	Le Moon	May 13, 1930
1,816,645	Giordano	July 28, 1931
2,049,141	Schneider	July 28, 1936
2,269,901	Bletcher et al.	Jan. 13, 1942
2,311,018	Bahnson, Jr.	Feb. 16, 1943
2,529,223	Moen	Nov. 7, 1950
2,568,429	Burnam et al.	Sept. 18, 1951
2,573,904	Grossman	Nov. 6, 1951
2,583,232	Russell	Jan. 22, 1952
2,583,234	Russell et al.	Jan. 22, 1952