Oct. 13, 1970 H. R. BILLETER 3,533,555

INSTITUTIONAL SHOWER HEAD

Filed Aug. 28, 1968

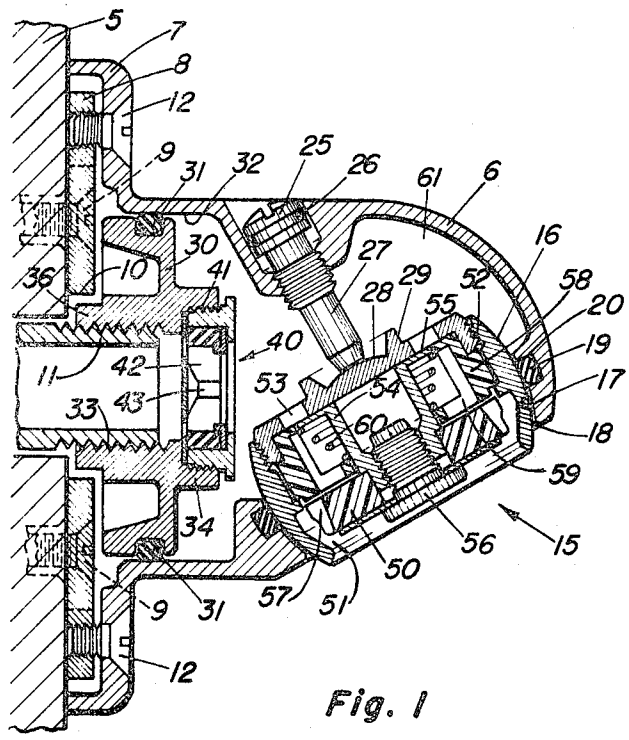


Fig. 1

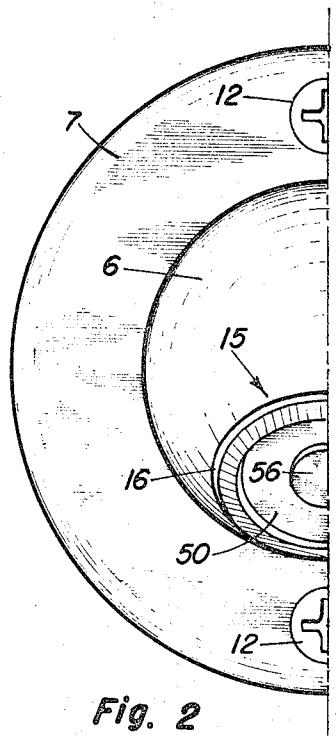


Fig. 2

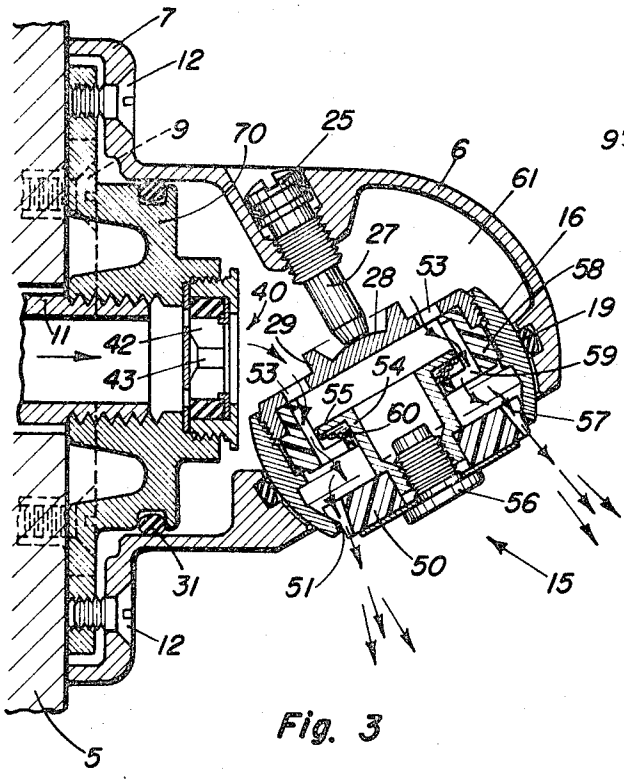


Fig. 3

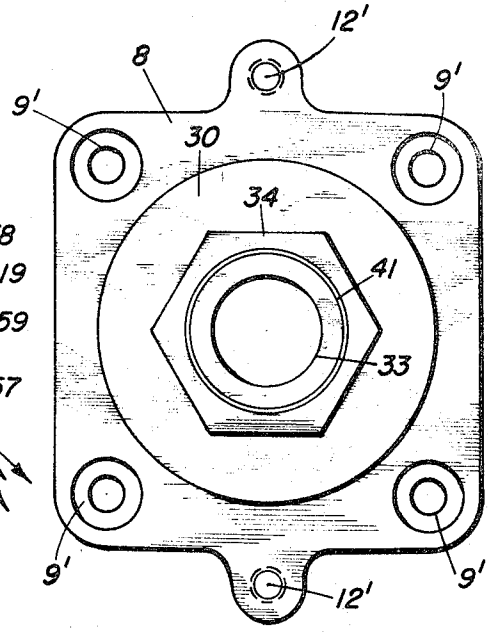


Fig. 4

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INSTITUTIONAL SHOWER HEAD

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ABSTRACT OF THE DISCLOSURE

An institutional type shower head in which the spray discharge angle of the unit is adjustable and locked in position by an adjusting screw on top of the casing. A flow control device in the shower head is supported on a wall mounting plate which may be screwed onto the water supply pipe. The mounting plate is adjustable and in sealing engagement with the interior of the shower head casing.

BACKGROUND OF THE INVENTION

This invention relates in general to shower heads but more particularly to institutional types of shower heads for use in schools, hotels, etc., and other public places where gang showers are provided. It is therefore essential that tamper-proof adjustments be provided and the device must be ruggedly constructed. It is accordingly an object of the present invention to design an improved type of institutional type of shower head which is tamper-proof; has a relatively smooth, neat exterior surface; incorporates an automatically self-cleaning spray discharge unit; has adjustable means for directing the spray discharge in any desired direction; provides flow control means for regulating the water flow through the shower head; and has adjustable wall mounting plates upon which the unit is supported.

SUMMARY OF THE INVENTION

The shower head casing has a flange portion for supporting the device upon a wall mounting plate. The mounting plate may be screwed onto the water supply pipe and the outer edge is in slidable and sealing contact with the inner surface of the casing so that variations in the threaded engagement with the water supply pipe can be compensated for. A flow control device is screwed into the mounting plate in front of the water supply pipe to maintain a constant rate of flow through the shower head regardless of water pressure variations. The shower head unit is a self-contained capsule having outer convex surfaces which are rotary slidable in the inner concave surface of the spray opening in the casing. The mutual contacting surfaces are sealed by an O ring. The shower head unit is arranged to be tilted or rotated so that the spray discharge can be directed at any desired angle upon the bather. An adjusting screw contacts a curved surface on the rear side of the shower head unit to provide the adjustment and lock it in the selected position.

DESCRIPTION OF THE DRAWINGS

Referring to the drawings:

FIG. 1 is a cross-sectional side elevation of the shower head of the invention;

FIG. 2 is a front view of one-half portion of the device;

FIG. 3 is a cross section of a slightly different embodiment, similar to FIG. 1, but showing the shower head in spray discharge position; while

FIG. 4 is a plan view of the wall mounting plate.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The shower head of the invention is mounted upon

the wall 5 of the shower room and comprises an outer casing 6 having a smooth rounded outer contour projecting outwardly and downwardly from the integral rear circular mounting flange 7. For supporting the shower head unit a square mounting plate 8 is provided secured to the wall 5 by mounting screws 9, inserted in screw holes 9' as shown in FIG. 4. The mounting plate 8 has a central opening 10 for accommodation of the inlet water supply pipe 11 extending through the wall 5. The flange 7 of the shower head unit is in turn fastened directly upon the wall plate 8 by the mounting screws 12 threaded into screw holes 12' arranged in the top and bottom ear portions formed in the mounting plate 8. These exposed screws 12 are preferably of the vandal-proof Allen head type.

The spray dispersing and operating mechanism consists of a unitary capsule type casing indicated generally at 15 having a convex annular side surface 16 that fits into a mating inner concave surface 17 formed in the opening 18 in casing 6. This opening 18 is smaller in diameter at its outer edge than at its inner edge inside the casing and enables the unit 15 to be placed into position by inserting it from the rear side of the casing 6, until the surfaces 16 and 17 are in slidable contact with each other. The unit 15 is thereby prevented from dropping out of the casing by the smaller outer edge of the opening 18. To provide a good seal between the surfaces 16 and 17 and still permit rotary tilting adjustment of the unit 15 in opening 18, an O-ring 19 is recessed in an annular slot 20 formed in casing 6. This O-ring 19 is so arranged that water pressure within the casing 6 tends to force the O-ring into tighter sealing engagement with the unit 15 and thereby prevent leakage outward.

To provide for rotary or tilting adjustment of the unit shower head 15 in the spray opening 18, and to lock it in the selected position, an adjusting screw 25 is provided which is threaded into the top side of casing 6, where it is relatively inconspicuous but still accessible for manipulation. The screw 25 has an O-ring seal 26 under its slotted head and a shank portion 27 which extends down inside the casing 6 into contact with a curved surface 28 formed on the rear enclosing plate 29 of the shower head unit 15. When adjusting screw 25 is loosened and the shank 27 disengaged from curved surface 28, the unit 15 as a whole can be grasped at its front end and rotated or tilted about its axis within casing opening 18. In this manner the spray discharge direction from unit 15 may be selected anywhere within a range of between 15 to 30 degrees so the spray discharge will contact the bather at a chosen angle for best results. Again tightening the adjusting screw 25 locks the shower head unit 15 in the selected spray discharge position.

The rear side of the hollow casing 6 is closed off by an annular adjustable pipe fitting 30, the outer edge of which has an O-ring seal 31 recessed in it in slidable contact with the inner surface 32 of the casing 6 as shown. The pipe fitting 30 has an axial threaded portion 33 which enables the fitting to be screwed onto the end of the water supply pipe 11 passing through the wall 5. The pipe fitting 30 is therefore adjustable in and out upon the end of the supply pipe 11 to compensate for variances in the length of the pipe when cut off by the installer. The O-ring seal 31 is provided to prevent leakage outward from the casing 6, regardless of the relative position of the pipe fitting 30 in the interior of casing 6. To facilitate threading of the pipe fitting 30 upon the pipe 11, wrench flats 34 are formed upon the front side of the fitting.

It will be evident from the above that in installing the shower head, the mounting plate 8 is first fastened by screws 9 upon the wall surface 5 at the correct height in

the shower room, the supply pipe **11** protruding through the opening **10** in the plate. Next the pipe fitting **30** is threaded upon the supply pipe **11** as far as desired, the inward extent being limited when the rear shoulder **36** either engages the wall surface **5** or the mounting plate **8**. The shower head casing **6** is then placed against the wall with the outer turned in edge portion of flange **7** engaging the wall, and the screws **12** are then applied to hold the unit onto the mounting plate **8**.

In order to conserve upon the supply of water an automatic flow control device **40** is incorporated within the casing **6**. It consists of a capsule that is threaded at **41** and supported upon the forward end of the pipe fitting **30** in axial alignment with the supply pipe **11**. A flexible rubber disc **42**, having a slotted opening **43** therein, is supported within the flow control device. In operation water flow from supply pipe **11** causes the opening **43** to automatically become more or less constricted so that a constant rate of flow is maintained through the shower head regardless of variations in the water supply pressures. An example of such a flow control device is disclosed in Pat. No. 2,515,073 issued July 11, 1950.

Referring more specifically to the shower head unit indicated generally at **15**, this is of the automatically self-cleaning type, and in FIG. 1 is shown as being in the normal position when no water flow is taking place through the device and with the spray disc **50** withdrawn from the spray discharge opening **18** of the device. In FIG. 3 the device is shown in the position when water flow takes place through the unit. The enclosing casing **16** is formed with a front spray discharge opening or gap **51** and at the rear end is threaded at **52** for supporting the rear plate **29** against which the adjusting screw **27** bears. A series of holes **53** in plate **29** allow water flow to enter the unit. Reciprocal within the casing **16** is a cup-shaped pressure member **54** having a flange **55** formed at its upper end normally bearing against the bottom of the rear plate **29**, and carrying the spray disc **50** on its lower end.

The spray disc **50** is clamped against a shoulder on the cup-shaped member **54** by the screw **56** threaded axially into the cup member **54** as shown. The spray disc **50** is provided around its peripheral edge with the usual plurality of serrations **57** arranged so that when the disc **50** is projected into contact with the side **51** of the casing opening **16**, a spray discharge is produced. Clamped within the unit **15** by plate **29**, there is a bushing **58** for guiding the cup member **54** and which together with the flange **55** serves to normally block the openings **53** in plate **29**, as seen in FIG. 1. Bushing **58** also has a series of water passages **59** formed in it. A restoring spring **60** in the casing **16** extends between the flange **55** and the bottom end of the bushing **58**.

DESCRIPTION OF THE OPERATION

In the operation of the shower head as shown in FIG. 3, and assuming that the adjusting screw **25** has locked the unit **15** in a position to direct the shower spray as desired, water flow takes place from the supply pipe **11**, through the flow control device **40** where the flow is regulated to a constant value, and then into the chamber **61**. As pressure in chamber **60** builds up it forces the flange **55** away from its blockage of openings **53**, thereby projecting the cup member **54** downward together with the spray disc **50**. When the spray disc serrations **57** engage the sides of casing opening **51**, the movement is stopped. Water flow now takes place through openings **53** and **59** and out through the spray discharge edge **57** of the spray disc **50**. The restoring spring **60** is also now compressed. It will be apparent that leakage outward from the shower head casing **6** and chamber **61** is prevented by O-rings **19** and **31**. When water flow from the inlet supply pipe **11** ceases, the pressure in chamber **61** drops and as a result restoring spring **60** is effective to restore the parts of unit **15** back to the normal position illustrated in FIG. 1. When the spray disc **50** is withdrawn from engagement from the outer spray edge **18** of casing **16**, a relatively wide gap **51** is produced, which enables the casing interior **61** to be completely drained of residual water. This action renders the shower head automatically self-cleaning, prevents clogging, eliminates dripping, reduces maintenance and prevents formation of lime deposits on the parts.

In FIG. 3 there is also illustrated an alternative form of mounting plate for the shower head. It will be noted that in FIG. 1 the separate mounting plate **8** may be initially installed on the job and at some time later the shower head casing **6** and the pipe fitting **30** may be installed. In FIG. 3, however, the mounting plate and pipe fitting are combined into a single unitary structure **70**. This plate **70** may be installed in position at the time the shower head unit is attached to it, thereby precluding the accumulation of dirt and dust upon the parts of the shower head while the shower room is being constructed. The combined mounting plate **70** is threaded onto inlet pipe **11**, and supports the flow control unit **40** on the front end. The O-ring slidable inside the casing **6** compensates for variations in the threaded location of the unit on the inlet pipe **11**. The mounting screws **9** fasten the plate **70** to the wall **5**, while screws **12** secure the shower head casing **6** to the plate **70**.

I claim:

1. In an institutional type of shower head, a casing having a flange formed on the rear side for supporting the same upon a wall surface and a projecting portion on the front side having a circular spray opening formed therein, a shower head unit in said spray opening, said shower head unit and spray opening having mutual contacting surfaces whereby said shower head unit is adapted to be tilted at any desired spray discharge angle in said spray opening, sealing means between said mutual contacting surfaces, said shower unit being inserted in position in said spray opening from the rear side of said casing, means around said casing opening for confining said shower head unit within said spray opening, said shower unit haivng a curved surface on the rear side thereof, and an adjusting screw extending through said casing into contact with said shower head curved surface for locking said shower head unit in any desired angular spray discharge position.

2. The shower head as claimed in claim **1**, in which the sealing means between the mutual contacting surfaces of the shower head unit and the casing consists of an O-ring arranged so that water pressure within the casing serves to seal the O-ring more effectively.

3. In an institutional shower head mounted on a wall, a casing having a flange portion formed at the rear end and a forward projecting portion having a spray opening therein, a shower head unit in said spray opening, said shower head unit arranged to be inserted in said casing from the rear side thereof, means for adjusting and locking said shower head unit in said spray opening to direct a spray discharge stream in any desired direction, a mounting plate fastened to the wall surface having a pipe opening therein, said shower head flange portion being fastened to said mounting plate for supporting said shower head casing on said wall surface, and an annular pipe fitting arranged inside said casing having threaded engagement with a water supply pipe extending through said mounting plate pipe opening, said pipe fitting having sealing engagement at its peripheray with the inner surface of said casing.

4. The shower head as claimed in claim **3**, in which the sealing engagement of the pipe fitting with the casing unit surface consists of an O-ring slidable in said casing inner surface and arranged to compensate for variations in the threaded engagement of said pipe fitting with the water supply pipe.

5. In an institutional shower head, a casing mounted on a wall having a flange portion on the rear thereof and a forward projecting portion with a spray opening there-

in, a shower head unit arranged in said spray opening, means in said casing for adjusting said shower head unit to direct a spray discharge in a variable number of directions, a mounting plate secured to the wall surface having a pipe opening therein, said shower head flange portion being fastened to said mounting plate for supporting said shower head casing on said wall, an annular shaped pipe fitting in said casing having threaded engagement with a water supply pipe extending through the pipe opening in said mounting plate, the outer edge of said pipe fitting being in slidable sealing engagement with the interior surface of said casing, and flow control unit supported on said pipe fitting in front of said water supply pipe.

6. In an institutional type shower head, a wall mounted casing having a spray opening therein, a self-contained shower head unit supported in said casing spray opening and adjustably arranged to direct a spray discharge stream in any desired direction, said shower head unit comprising an outer casing having a movable spray disc therein, a pressure member in said unit supporting said spray disc, spring means for holding said pressure member retracted in said shower head unit and said spray disc out of engagement with the spray discharge opening, and means responsive to water flow into said casing and said shower head unit for moving said pressure member and therefore said spray disc outward into engagement with the outer casing of said shower head unit to produce the spray discharge.

7. In an institutional type shower head supported on a wall surface, a casing having a rear mounting flange and a projecting portion having a spray discharge opening therein, a shower head unit adjustable in said spray discharge opening, a wall supported mounting plate, means for supporting said shower head upon said mounting plate from its flange portion, said mounting plate having an axial threaded opening therein for attachment to a water supply pipe, said mounting plate having an annular outer edge portion in slidable in and out engagement with the interior surface of said shower head casing to compensate for variations in the threaded engagement of said mounting plate and said water supply pipe, and an O-ring seal between the annular edge portion of said mounting plate and said shower head casing where they are in slidable engagement.

8. The shower head as claimed in claim 7, in which said mounting plate supports a flow control device on the inner end thereof and in axial alignment with said water supply pipe.

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U.S. Cl. X.R.

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