

[54] **ADJUSTABLE SHOWER APPARATUS**

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[58] Field of Search **239/587, 588**

[56] **References Cited**

UNITED STATES PATENTS

192,728	7/1877	Bailey.....	239/587 X
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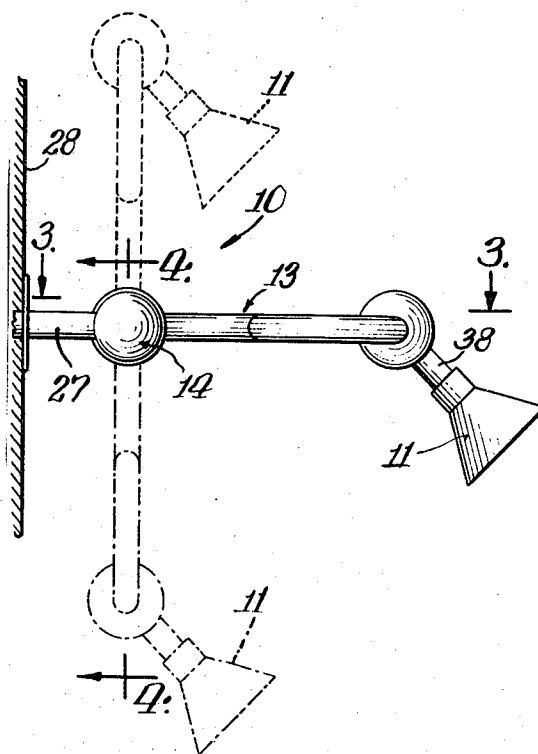
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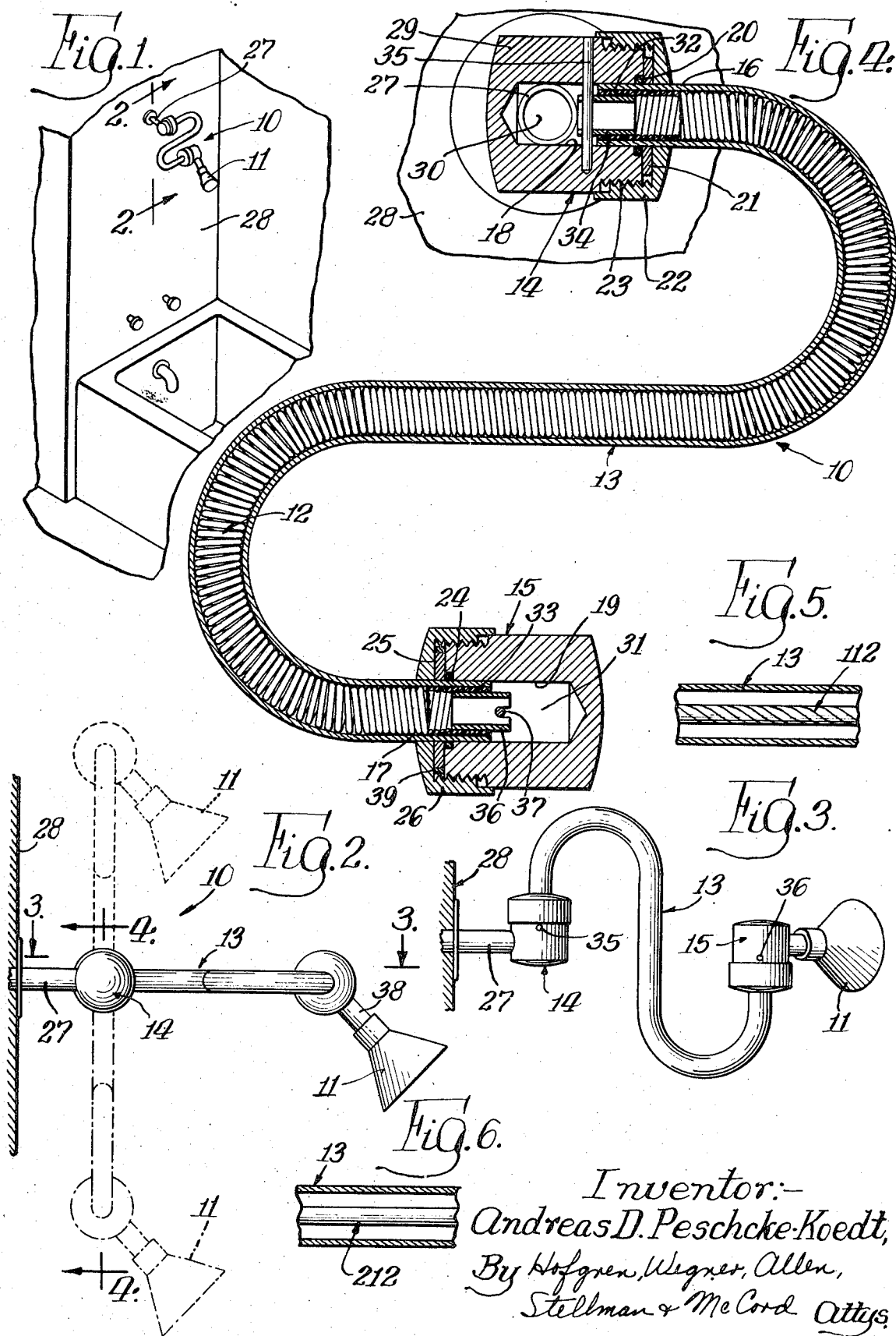
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[57] **ABSTRACT**

Improved apparatus for mounting a device, such as a shower head, to extend at a preselected angle to the horizontal in all positions of vertical adjustment thereof. The apparatus includes an elongated element having one end swingable about a mounting adapted to be fixedly positioned such as to a wall. The shower head is connected to the other end and means are provided for maintaining a desired angular disposition of the shower head notwithstanding a swinging of the elongated element about the first end.

13 Claims, 6 Drawing Figures





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ADJUSTABLE SHOWER APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an adjustable mounting device and in particular to liquid flow control devices, such as shower apparatuses.

2. Description of the Prior Art

In my copending application, Ser. No. 75,952, 75,952 filed Sept. 28, 1970 for an Adjustable Shower Apparatus, I disclose a number of different adjustable shower apparatuses arranged to permit an adjustment in the positioning of the shower head over a wide range of different heights while maintaining the shower head at a preselected downward angle.

SUMMARY OF THE INVENTION

The present invention comprehends a further improved adjustable shower head apparatus arranged for movably mounting the shower head so as to be disposed selectively at any one of a plurality of different elevations. The apparatus includes means for maintaining the shower head at a preselected downward angle automatically notwithstanding the adjustment of the elevation thereof.

More specifically, the invention comprehends an apparatus including a first connector, a second connector, an S-shaped member having a first end connected rotatably about a first horizontal axis to the first connector, and a second end movably connected to the second connector for rotation of the second connector about a second horizontal axis at the second end extending parallel to the first axis and swingable in an arc about the first axis as a result of swinging of the S-shaped member about the first axis, and a substantially nontwistable flexible connector extending longitudinally through the S-shaped member and having first and second ends extending parallel to and disposed within the S-shaped member first and second turned ends, respectively, means fixedly connecting the first S-shaped member end to the first connector, and means fixedly connecting the second S-shaped member end to the second connector, the S-shaped member one end extending perpendicularly to a plane perpendicular to the axes and the S-shaped member second end extending oppositely perpendicularly to the place whereby the second connector pivots about the second axis oppositely equiangularly relatively to a pivoting of the S-shaped member one end about the first axis to maintain a desired angle of the first connector to the horizontal in all positions of swinging of the S-shaped member about the first axis.

The first connector may comprise a wall mounting means. The second connector may comprise an adapter for connecting a shower head to the distal end of the S-shaped member, with the S-shaped member defining a duct for transferring water from the wall connector to the shower head. The flexible connector may comprise selectively a hollow connector adapted to pass the water therethrough, or a substantially solid connector permitting the water to flow through the duct around the connector. The opposite ends of the flexible connector may be secured to the wall mounting connector and the shower head connector by suitable means such as pins. In one form, the flexible connector comprises a helically wound spring element. The flexi-

ble connector illustratively may alternatively comprise a cable, a flexible tube, etc. The opposite ends of the flexible connector may be turned so as to extend in mutually opposite directions for facilitating the maintaining of the desired shower head angle.

BRIEF DESCRIPTION OF THE DRAWING

Other features and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawing wherein:

FIG. 1 is a perspective view of a shower apparatus embodying the invention;

FIG. 2 is a side view thereof with the lowermost and uppermost adjustable positions thereof shown in broken lines;

FIG. 3 is a plan view thereof;

FIG. 4 is a diametric section thereof taken substantially along the line 4—4 of FIG. 2.

FIG. 5 is a fragmentary diametric section of the tubular duct showing a modified form of flexible connector therein; and

FIG. 6 is a fragmentary section of still another form of the tubular duct showing still another modified form of flexible connector therein.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the exemplary embodiment of the invention as disclosed in FIGS. 1—4 of the drawing, a shower apparatus generally designated 10 is shown to comprise an improved means for movably positioning a shower head 11 in any one of an infinite number of different elevational positions, with the shower head being maintained at a preselected downward angle in each of the different positions so as to maintain a preselected downward delivery of shower water therefrom.

Thus, the present apparatus is adapted for facilitated use of a shower by persons of different heights as the apparatus 10 may be swung to any of the selectable positions by the user without changing the desired angle of water delivery. This structural concept is comprehended in the structure of my previous application Ser. No. 75,952, identified above. The present invention comprehends a further improvement in such structure utilizing a flexible connector generally designated 12 within a tubular duct 13 extending between a wall mounting connector generally designated 14 and a shower head connector generally designated 15 to provide the desired maintained angularity of the shower head in the different elevational positions.

More specifically, the duct 13 may comprise a tubular element having a proximal turned end 16 and a distal turned end 17 adapted to be connected in fluid transfer association respectively with the connectors 14 and 15. Duct end 16 is coaxially rotatably received in a bore 18 of connector 14 and duct end 17 is coaxially rotatably received in a bore 19 of connector 15. Illustratively, duct end 16 may be sealingly retained in bore 18 against axial displacement therefrom by means of a sealing O-ring 20, a flange washer 21 secured to the duct end as by soldering, and a cap 22 threadedly secured to a threaded portion 23 coaxially of bore 18, as shown in FIG. 4. Duct end 17 is similarly connected in bore end 19 of connector 15 by a similar sealing O-ring 24, a flange washer 25, and a cap 26. As shown in

FIG. 3, water under pressure may be delivered to connector 14 through the delivery pipe 27 extending from the shower stall wall 28 whereby the connector body 29 is fixedly mounted to the wall 28 with the axis 30 of the connector bore 18 extending horizontal parallel to the wall.

Duct end 17 extends axially parallel to duct end 16 but in an opposite direction. Thus, the axis 31 of connector bore 19 is parallel to axis 30 of connector bore 18 and duct ends 16 and 17 extend oppositely perpendicularly to a vertical plane perpendicular to the respective axes 30 and 31.

Flexible connector 12 extends longitudinally through duct 13 between ends 16 and 17, as best seen in FIG. 4. The proximal end of the flexible connector is fixedly secured to wall mounting connector 14 and the distal end 33 of the flexible connector is fixedly secured to the shower head connector 15. More specifically, flexible connector end 32 is secured to connector 14 by means of a rigid tubular bushing 34 coaxially fixed in end 32 and fixed to the connector 14 by a pin 35 extending diametrically through bore 18. Flexible connector end 33 is secured to connector 15 by means of a similar tubular bushing 36 and pin 37. Bushing 36 is fixed to flexible connector end 33 at an angle of approximately 45° relative to the position of bushing 34 at the proximal end of the flexible connector so as to dispose the shower head 11 at a preselected 45° angle as shown in FIG. 2. As will be obvious to those skilled in the art, any desired angle may be selected for the desired relationship between the two bushings 34 and 36 to provide any desired preselected angular disposition of the shower head. Shower head 11 is connected in fluid transfer association to connector bore 19 by a suitable pipe extension 38. In the illustrative embodiment of FIGS. 1-4, the flexible connector 12 comprises a helically wound spring which is substantially free of twist while extending flexibly between the fixed ends 16 and 17. The outer diameter of the spring 12 may be made similar to the inner diameter of the wall of the duct 13 so that the spring fits snugly coaxially within the duct. In the illustrative embodiment, the duct 13 is S-shaped with the coil spring 12 following the S-shaped configuration of the duct to be similarly S-shaped in its flexed arrangement.

As the flexible connector 12 is substantially non-twistable connector 15 is caused to remain in a preselected angular disposition relative to the horizontal axis 31 irrespective of the swinging of the duct 13 about axis 30 of wall mounting connector 14. This functioning of apparatus 10 is illustrated in FIG. 2. Thus, as shown in full lines, when the apparatus is arranged with the duct 13 extending substantially horizontally perpendicularly outwardly from wall 28, shower head 11 is caused to be directed downwardly at a preselected angle, such as the 45° angle discussed above, and at an intermediate elevation. The user may change the elevation of the shower head by simply swinging the apparatus 10 about the axis 30 of connector 14 selectively to an uppermost position or a lowermost position illustrated in broken lines in FIG. 2. As shown, the shower head 11 remains at the preselected downward angle throughout the entire range of movement thereof. The maintenance of the angular disposition of the shower head is effected by the maintained

fixed angularity of the opposite ends 16 and 17 of the flexible connector relative to the connectors 14 and 15, respectively, while permitting the desired pivotal movement of the duct 13 about the axes 30 and 31, respectively. Thus, an improved maintenance of the shower head angle is maintained in apparatus 10 while yet the apparatus is extremely simple and economical of manufacture. As moving parts are effectively minimized, the apparatus 10 has a substantially trouble-free long life.

In the embodiment of FIGS. 1-4, the flexible connector effectively comprises a hollow element permitting the shower water to flow coaxially therethrough in passing from the delivery pipe 27 to the shower head 11. In FIG. 5, a modified form of flexible connector suitable for use in carrying out the disclosed invention is shown to comprise a flexible cable 112 extending longitudinally through the tubular duct 13. Thus, in the embodiment of FIG. 5, the shower water would flow around the exterior of the cable 112 in passing to the shower head. Similarly, in FIG. 6, a further modified form of flexible member generally designated 212 is shown to comprise a flexible tube which may be formed of a suitable flexible material such as plastic. The tube may have an outer diameter smaller than the inner diameter of the duct 13 as shown in FIG. 6, or may have an outer diameter substantially equal thereto to function similarly to the coil spring flexible connector embodiment of FIGS. 1-4. Where the tube has a smaller diameter, the water flow may selectively be around the tube or through the interior of the tube as well as around the tube as desired. Other forms of flexible connectors may be employed within the scope of the invention as will be obvious to those skilled in the art.

Control of freedom of adjustability of the shower apparatus is afforded by controlled tightening of caps 22 and 26 facially engaging flange washers 21 and 25, respectively, such that washers 21 and 25 effectively define friction plates. A space ring 39 may be provided coaxially about washer 25 for further facilitating smooth turning of the shower head when desired.

Thus, the invention comprehends an improved means for mounting a device for variable elevational disposition while maintaining the device at a preselected angle. The invention has been disclosed in connection with an improved shower apparatus. As will be further obvious to those skilled in the art, the mounting means defined by the apparatus may be utilized in connection with other devices such as lamp shades and the like where vertical adjustability and maintained angularity is a desideratum.

The foregoing disclosure of specific embodiments is illustrative of the broad inventive concepts comprehended by the invention.

I claim:

1. Shower apparatus comprising:

- a shower head connector adapted to carry a shower head;
- a wall mounting water supply connector;
- a duct having a first end connected rotatably about a first horizontal axis in water transfer association with said wall mounting connector, and a second end movably connected in water transfer association with said shower head connector for rotation of said shower head connector about a second

horizontal axis at said second end extending parallel to said first axis and swingable in an arc about said first axis as a result of swinging of said duct about said first axis;

a substantially nontwistable flexible connector extending longitudinally through said duct and having first and second ends;

means fixedly connecting said first duct end to said wall mounting connector; and

means fixedly connecting said second duct end to said shower head connector, said one duct end extending perpendicularly to a plane perpendicular to said axes and said second duct end extending oppositely perpendicularly to said plane whereby said shower head connector pivots about said second axis oppositely equiangularly relative to a pivoting of said duct one end about said first axis to maintain a desired angle of a shower head carried by said shower head connector to the horizontal in all positions of swinging of said duct about said first axis.

2. The shower apparatus of claim 1 wherein said flexible connector comprises a helically wound element.

3. The shower apparatus of claim 1 wherein said flexible connector comprises a cable.

4. The shower apparatus of claim 1 wherein said flexible connector comprises a tube.

5. The shower apparatus of claim 1 wherein said flexible connector is hollow and has an outer surface substantially similar to the inner surface of said duct.

6. The shower apparatus of claim 1 wherein said flexible connector has an outer cross-section substantially smaller than the inner cross-section of said duct for permitting water flow through the space in said duct outwardly of said flexible connector.

7. Shower apparatus comprising:

a shower head connector;

a wall mounting water supply connector;

a duct having a turned first end connected rotatably about a first horizontal axis in water transfer association with said wall mounting connector, and a second oppositely turned end movably connected in water transfer association with said shower head connector for rotation of said shower head con-

necter about a second horizontal axis at said second end extending parallel to said first axis and swingable in an arc about said first axis as a result of swinging of said duct about said first axis;

a substantially nontwistable flexible connector extending longitudinally through said duct and having first and second ends extending parallel to and disposed within said duct first and second turned ends respectively;

means fixedly connecting said first duct end to said wall mounting connector; and

means fixedly connecting said second duct end to said shower head connector, said one duct end extending perpendicularly to a plane perpendicular to said axes and said second duct end extending oppositely perpendicularly to said plane whereby said shower head pivots about said second axis oppositely equiangularly relative to a pivoting of said duct one end about said first axis to maintain a desired angle of the shower head carried by said shower head connector to the horizontal in all positions of swinging of said duct about said first axis.

8. The shower apparatus of claim 7 wherein said duct is serpentine.

9. The shower apparatus of claim 1 wherein said duct is S-shaped.

10. The shower apparatus of claim 1 wherein said duct is curved between said duct ends, and said duct ends are rectilinear.

11. The shower apparatus of claim 1 wherein said flexible connector is provided with a rigid end portion at each of said first and second ends thereof, and said connecting means comprises means locking said rigid end portions to said wall mounting connector and shower head connector respectively.

12. The shower apparatus of claim 11 wherein said rigid end portions are tubular.

13. The shower apparatus of claim 7 wherein said shower head connector is arranged to maintain a shower head carried thereby at a downward angle to the horizontal of approximately 45° at all positions of said duct.

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