This invention relates to a spray nozzle insert, and more particularly to an insert which is readily adjustable so that sprays of various intensities and characteristics may be easily selected and maintained.

For purposes of illustration and description, the insert of the present invention is herein shown and described as applied to a shower head, but it will be readily seen that the invention is also applicable to other nozzles, such as hose nozzles.

Various adjustable shower head spray nozzles are available, but those on the market are generally intricate, often contain a multiplicity of working parts which are subject to corrosion, wear and tear, and are costly to produce.

It is an object of the present invention to provide an insert which may be readily mounted on a shower head, and which has simplified means for adjustably controlling the shower spray as to force, quality and direction.

Many of the adjustable shower head nozzles presently available attain their adjustability by controlling the diameter of a plurality of relatively small openings in the nozzle. These small openings in course of time become clogged by dirt, or mineral deposits from the water flowing therethrough, so that the flow therefrom is impeded. The same dirt, or mineral deposits, and also corrosion, frictionally limit or eliminate the effectiveness of the adjustment means, so that after some use desired adjustment is often not attainable.

It is therefore another object of the invention to provide an adjustable spray nozzle insert which has one relatively large opening, rather than a plurality of small openings, so that mineral deposit is eliminated, and to provide such an insert which combines with efficient spray control adjustment means, ready means for removing impeding dirt from the shower head without requiring the dismantling of the shower head.

It is a further object of the invention to provide an insert of the character described which has its adjustment means accessible and easy to operate.

It is still a further object of the invention to provide a device of the character described which is economical to manufacture and assemble, but which has a long utilitarian life.

With these and other objects in view, the invention consists of the construction, arrangement and combination of various elements of the device whereby the objects contemplated are attained, as hereinafter set forth, pointed out in the appended claims, and illustrated in the accompanying drawing, in which

FIG. 1 is an isometric view of a shower head showing the insert of the present invention installed therein;
FIG. 2 is an enlarged isometric view of the insert of the present invention;
FIG. 3 is a vertical cross-sectional view taken on line 3—3 of FIG. 2;
FIG. 4 is a fragmentary view similar to FIG. 3 but taken in a plane 45° from that shown in FIG. 3 and showing the core member in a different position;
FIG. 5 is an isometric view of the wafer valve member of the present invention;
FIG. 6 is an isometric view of the adjustable core member of the present invention.

The invention as herein illustrated and described has a shower head, generally designated 10, having the usual ball joint 12, water supply pipe connector 14, and nozzle 16, the free end of which is preferably tapered, as at 18.

Insertable in the nozzle 16 at the open tapered end 18 thereof is a tubular insert 20 having a cylindrical body member 22. Insertion is attained by providing external threads 24 on the body member 22 intermediate the ends thereof, the threads 24 being mateable with internally disposed threads in the nozzle 16 (not shown). At the lower end of the insert 20, as illustrated in the drawing, there is a collar 26, which in turn is preferably tapered to match the tapered end 18 of the nozzle 16, the collar 26 being positioned so that, when the insert 20 is fully disposed in the nozzle 16, the collar 26 will be seated on the end 18 of the nozzle 16. For ease in screwing the insert 20 into the nozzle 16, a plurality of protruding, parallel ridges 28 may be provided on the exterior surface of the collar 26, or in lieu thereof other gripping means may be provided.

Disposition internally in the tubular insert 20 intermediate the ends thereof is an annular valve seat 30, shown in FIGS. 3 and 4 of the drawing, having an opening 32 therethrough. The surfaces of the valve seat 30 are convergingly tapered toward the opening 32.

A wafer valve member 40 is freely disposed within the body 22 of the insert 20 above the valve seat 30. The wafer valve 40 is preferably square, although it may be polygonal, and also, preferably, the side angles of the wafer valve 40 are rounded, as shown at 42, in FIG. 5.

An upper flange 44 and a lower flange 46 are centrally disposed on the wafer valve 40. An internally threaded and centrally disposed through bore 48 passes through the wafer valve 40 and the flanges 44 and 46, and a smaller bore 49 passes through the wafer valve 40 laterally of the flanges 44 and 46, the bore 49 serving as a seat for a spring hereinafter described.

A helical spring 50, shown in FIG. 3, is disposed within the body 22 of the insert 20. The spring 50 has a protruding upper leg 52 which passes through a bore 54 adjacent the upper end of the body 22 of the insert 20, and a protruding lower leg 56 which passes through the bore 49 in the wafer valve 40. The spring 50 is thus retained in the insert 20 and biases the wafer valve 40 toward a seated position on the valve seat 30, while at the same time serving to resist turning of the wafer valve 40 within the insert 20.

A generally cylindrical, externally threaded core member 60 is provided. The threads on the core member 60 are disposed so as to be mateable with the threads of the bore 48 in the wafer valve 40 when the core member 60 is inserted therein. At the lower end of the core member 60 is a collar 62 disposed so as to pass through the opening 32 in the valve seat 30 and to seat on the flange 46 on the wafer valve 40 when the core member is screwed home. Preferably, the clearance between the collar 62 and the sides of the opening 32 is close.

Protruding from the collar 62 is a gripping member 64, which is preferably elongate and flat, and which preferably extends beyond the plane of the lower end of the body 22 of the insert 20 when the core member 60 is mounted, so as to be readily accessible for finger gripping and turning of the core member 60.

Disposed adjacent to the upper end of the core member 60 is a transverse bore 66, and stop means, such as a cotter pin 68, is seated in the bore 66 and prevents therefrom, said pin 68 being disposed so that, when the core member 60 is unscrewed, the pin 68 will abut the flange 44 so as to prevent removal of the core member 60 from the wafer valve 40.

To assemble the device of the present invention, the core member 60 is threadably inserted in the wafer 40 until the upper end of the core member 60 and the bore 66 are exposed. The pin 68 is then inserted in the bore 66 with its ends protruding therefrom. The assembly of the wafer valve 40 and the core member 60 is then
placed in the body 22 of the insert 20, and the wafer valve 40 is seated on the valve seat 30, with the core member 60 protruding through the opening 32 in the valve seat 30. The lower leg 56 of the spring 50 is located in the bore 49 in the wafer valve 40, and the upper leg 52 of the spring 50 is located in the bore 54 in the body 22 of the insert 20.

When the assembly of the insert 20 is completed, the insert 20 is screwed into the nozzle 16 of the shower head 10.

It will be seen that the spring 50 will bias the wafer valve 40 toward seated position on the valve seat 30, but because the wafer valve 40 is square or polygonal, while the upper surface of the valve seat 30 is tapered downwardly, the flow of water striking the wafer valve surface will be broken to assume spray characteristics, and will then flow around the wafer valve 40 and through the opening 32 in the valve seat 30.

The quantity of water flowing through the opening 32 in the valve seat 30, and the quality and direction of the spray emitted therefrom, are adjustable controlled by the core member 60. If a very slight flow is desired, the core member 60 is turned clockwise by finger torque applied to the gripping member 64. The collar 62 will then pass into the opening 32 in the valve seat 30 until the collar 62 abuts on the flange 46 of the wafer valve 40. In this position, the only water flow will be that which passes through the space clearance between the collar 62 and the side of the opening 32, and only a mild spray will be emitted.

If a more forceful and enlarged spray is desired, the core member 60 is turned counterclockwise. As the collar 62 moves downwardly and outwardly from its position within the opening 32, a greater flow and an enlarged spray will be accomplished, this condition increasing as the counterclockwise movement of the core member 60 is continued. The counterclockwise movement is stopped whenever the desired spray is accomplished.

It will be evident that as the collar 62 is removed from the opening 32 in the valve seat 30, the flow through the opening 32 will strike the collar 62, and the collar 62 will thus serve to break the direct force of the flow and give a better spray quality thereto.

If loose dirt or other matter carried by the water should accumulate in the body 22 of the insert 20 and be lodged about the wafer valve 40 so as to interfere with the flow of water around the wafer valve 40, upward finger pressure applied to the free end of the gripping member 64 of the core member 60 against the biasing action of the spring 50 will unseat the wafer valve 40 from the valve seat 30, thus permitting a much more forceful flow of water through the insert 20 and the opening 32. This forceful flow will dislodge the accumulated dirt or other matter and pass it out of the insert 20.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment thereof, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent structures and devices.

I claim:
1. An insert for a spray nozzle which comprises: a tubular body member disposed so as to be inserted and secured in a spray nozzle; an annular valve seat internally disposed in the body member intermediate the ends thereof, said valve seat having a centrally disposed opening therethrough; a polygonal wafer valve disposed in the body member so as to be seated on the valve seat and provide a fluid flow passage around the wafer valve and through said opening; a core member adjustably mounted on the wafer valve and extending through said opening; and a collar mounted on the core member and disposed so as to be moveable from a position within said opening to a position externally thereof upon adjustment of the position of the core member relative to the wafer valve.
2. An insert for a spray nozzle as defined in claim 1, including spring biasing means disposed within the body member so as to bias the wafer valve toward its seated position on the valve seat.
3. An insert for a spray nozzle as defined in claim 2, wherein the spring biasing means are mounted on the wafer valve so as to impede lateral turning of the wafer valve within the body member.
4. In combination with a spray nozzle, an insert which comprises: a tubular body member; means for inserting and securing the insert in the nozzle; an annular valve seat internally disposed in the body member intermediate the ends thereof, said valve seat having a centrally disposed opening therethrough, said valve seat having a surface tapered toward said opening; a polygonal wafer valve freely disposed in the body member so as to be seated on the tapered surface of the valve seat and provide a fluid flow passage around the wafer valve and through said opening; a cylindrical core member threadedly mounted on the wafer valve and extending through said opening; a collar mounted on the core member and disposed so as to be moveable from a position within said opening to a position externally of said opening by adjustment of the threaded mounting of the core member on the wafer valve; and a spring mounted within the body member and seated on the wafer valve, said spring being disposed so as to bias the wafer valve toward the valve seat and impede lateral turning of the wafer valve within the body member.
5. An insert as defined in claim 4, including a gripping member mounted on the core member and protruding from the body member, said gripping member being disposed so as to be readily accessible for turning the core member so as to adjust the threaded mounting of the core member on the wafer valve and move the collar into and out of the opening.

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