This invention relates to a shower head construction wherein the diffuser of said head is disposable.

One of the objects of the instant invention is to provide a shower head which is adapted to receive a diffuser of a very thin construction.

Another object of the invention herein disclosed is to provide a shower head that may use a diffuser made of paper or other relatively non-expensive construction material.

A further object of this invention is to provide a diffuser that may be economically disposed of when the operation of the diffuser becomes unsatisfactory.

A problem which often occurs in shower heads is clogging of one or more of the holes in the diffuser and thereby the spray from the shower head is unsatisfactory. In order to correct the clogged condition of the shower head, a plumber must be called to replace or clean the entire shower head. In commercial establishments such as hotels and motels, it is very annoying to a weary traveler to find a shower head that is not working properly and then wait for the management to correct the situation.

The purpose of the instant invention is to provide a shower head wherein the diffuser may be readily removed and discarded and a new diffuser inserted without the aid of a plumber so that a guest may "do it himself." A supply of diffusers having various sized holes may be provided in a hotel room so that a guest may insert a diffuser with holes of a desired size to achieve the type spray he prefers. The guest may thereby correct any difficulties that he may have with a minimum of effort and delay and good will toward the proprietor is created thereby.

The means by which the foregoing and other objects are accomplished and the method of their accomplishment will readily be understood from the following specification upon reference to the accompanying drawings in which:

Figure 1 is a perspective view of a shower head attached to a pipe and a portion of the shower head is cut away to show the inner construction;

Figure 2 is a cross sectional view on an enlarged scale of the lower portion of the shower head shown in Figure 1;

Figure 3 is a bottom view of the shower head shown in Figures 1 and 2;

Figure 4 is a cross sectional view taken on line 4-4 of Figure 2; and

Figure 5 is a perspective view of a shower head having a port hole type retainer and a portion of the shower head is cut away to show the inner construction.

A shower head, generally indicated by numeral 11 as shown in Figure 1, is connected to a pipe 12 on a ball 13. The shower head 11 consists of a bell 14 which is secured to ball 13 by nut 15 to allow the shower head to be adjustably disposed.

The hollow, one-piece bell 14 has an integral cylindrical attachment wall 16 which forms a cavity or passage 17 through which water may flow. An annular groove 18 is formed in wall 16 and threads 19 formed in the wall are positioned between the groove 18 and the end of said wall which is reduced and provides an end shoulder that borders and defines an outlet for the passage 17.

At the diffuser end 20 of wall 16 is an annular end face having an annular sealing groove 22 and that portion of wall 16 immediately adjacent the sealing groove 22 is partially chamfered to define four buttresses 23 which are equidistantly disposed about the outer periphery of the wall as shown in Figure 4.

A one-piece diffuser retainer, generally indicated by numeral 24, comprises a cylindrical attachment wall 25 which has threads 26 on its inner periphery which mate with threads 19 on bell 14. The retainer 24 has a spray aperture 27 in the central portion thereof defined by a sealing flange or internal shoulder 28 which is integral with the wall 25. Diffuser support ribs 29 integral with sealing flange 28 extend across spray aperture 27 and provide an upstream abutment surface coplanar with the end face of flange 28. The outer periphery of wall 25 is knurled as generally indicated by numeral 31 in Figure 1 to provide a friction surface so that the retainer may be manually removed.

A one-piece diffuser indicated by numeral 32 in Figure 1 is substantially circular and relatively thin. Diffuser 32 includes an outer marginal lip portion having an annular ridge 33 which mates with groove 22 in bell 14. The central portion of diffuser 32 is provided with a plurality of holes or apertures 34. The holes 34 may be of a different diameter for each diffuser to provide a selection of sprays.

The diffuser 32 may be made of any type of inexpensive water-proof material such as Bakelite or polystyrene, or the diffuser may be made of a treated water-proof paper.

The top surface of the diffuser lip may be coated with an adhesive material near its outer periphery so that when the diffuser is placed in engagement with bell 14 and retainer 24 is tightened to hold the diffuser, a water-tight seal is made. The adhesive material is preferably a rubber base adhesive which does not set to a hard substance so that the diffuser and adhesive may be readily removed.

The shower head is assembled by attaching the pipe 12 to the pipe 13 and nut 15. The diffuser element 32 is then placed on bell 14 so that ridge 33 mates with notch 22 and the adhesive material retains the diffuser in position. The retainer 24 is then placed on bell 14. The retainer is threaded into position so that wall 25 registers with groove 18. The retainer is tightened so that the retaining flange 28 presses on the diffuser 32 to form a fluid-tight seal between the diffuser and the bell.

It should be noted that a leak may occur between the diffuser 32 and bell 14, the water has two avenues of escape, one through the spray aperture 27, and the other is past threads 19 and 26. However, there would be no undesirable spray in the second case because the water would necessarily pass through annular groove 18 and then fall down with the water that is coming through the spray aperture 27.

When the water is turned on so that it flows into chamber 17 then through aperture 21 and through holes 34, the weight and pressure of the water exerts a considerable force on the diffuser 32. The diffuser supports 29 support the diffuser 32 so that the force of the water will not break the diffuser. This is especially important when the diffuser 32 is made of a water-proof paper. The supports 29 allow a thin plastic diffuser to be used and thus the amount of plastic material may be reduced in the manufacture of plastic diffusers.

When the diffuser becomes clogged or a diffuser with a different size is desired, the retaining ring 24 is simply removed from the bell 14. The diffuser is removed from bell 14 by grasping the diffuser at one of the
chamfered portions between buttresses 23 and pulling the diffuser away from the bell and a new diffuser is replaced in the manner described above.

As may be seen in Figure 5, the diffuser 32 is readily adaptable to a shower head having a port hole type retaining. The shower head generally indicated by numeral 51 is attached to a ball 52 by nut 53 so that the shower head may be easily adjusted.

The shower head 51 has a ball 54 with a side attachment wall 50. Integral with the side wall 50 is a stud pivot ear 55 on one side of said wall and a retainer pivot ear 56 diametrically opposite said stud pivot ear. The bell 54 has a cavity 57 through which water may flow to diffuser aperture 58 which is defined by chamfered end wall or shoulder 59 on the extreme portion of side wall 50. The end face of wall 59 is provided with an annular groove 61 adjacent the diffuser aperture 58.

Pivoting mounted on ball 54 is a diffuser retainer 62 which has a pair of pivot ears 63 attached to one side of said retainer. The pivot ears are spaced to receive the retainer pivot ear 56 therebetween and the aforementioned ears have holes, not shown, which register so that a retainer bolt 60 may pass therethrough and thus provide an axle about which the retainer may pivot. Diametrically opposite the pivot ears 63 is a pair of nut engaging lugs 64 whose operation is described below. The retainer 62 contains a support wall 65 which defines a spray aperture 66. Said retainer 62 also has on its outer periphery a chamfered attachment wall 67.

Pivoted attached to ear 55 is a stud 68 consisting of a U-shaped support 69 and a threaded portion 71. The legs of the support 69 contain holes which register with a hole in ear 55 and a stud bolt 72 passes through said holes to provide an axle about which the stud may pivot. A wing nut 73 is readily engaged the portion 71 of the stud and the lugs 64 on the retainer.

The diffuser 32 is placed in the shower head by positioning ridge 33 on the diffuser into groove 61. As was previously described, an adhesive holds the diffuser to the bell. The retainer is then brought up into engagement with the diffuser. The support wall 68 engages the diffuser and holds it in tight engagement between wall 65 and wall 59 of the bell. The stud 68 is swung into position between lugs 64 and wing nut is then tightened against lugs 64 to bring the retainer into snug engagement with the diffuser.

It should be noted that as the wing nut is tightened, the support wall is forced upward and thus forms a tight seal between the diffuser and wall 59. It also should be noted that the chamfered wall 67 does not come in contact with the bell. Thus it is only the support wall 65 which offers the resistance and thus a tight seal may be formed.

When it is desired to remove the diffuser 32, the wing nut 73 is loosened and the stud 68 is pivoted so that the retainer may pivot about bolt 60, thus the diffuser 32 is exposed. Since the wall 59 is chamfered, the edges of the diffuser 32 may be easily grasped and thus the diffuser is readily pulled away from the bell. A new diffuser may then be replaced in the manner described above.

It is thus apparent that a hotel or motel having the above described shower heads in its guest rooms would provide a supply of diffusers to each guest room. The supply would consist of a selection of stacks of diffusers and each stack would be apertures of a different size to provide a variety of sprays. The supply of diffusers could be kept in a medicine cabinet or another convenient place. Thus a guest need only select a diffuser from a stock and insert it into the shower head as described above to have a uniform shower spray with his desired spray whether it be fine or full.

While I have shown and described particular embodiments of my invention, it will occur to those skilled in the art that variations, changes and modifications may be made without departing from my invention and I therefore aim in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of my invention.

I claim:

1. A renewable shower head construction comprising a hollow, one-piece shower bell having a cylindrical attachment wall defining a flow passage and terminating in an end shoulder that surrounds and defines an outlet for said passage, said shoulder providing a planar annular end face having an annular groove therein surrounding said outlet, a generally planar one-piece disposable diffuser member of lightweight, waterproof sheet material having a perforated central portion spanning said outlet and surrounded by an imperforate sealing lip having an annular upstanding ridge for mating in said groove to register and seal said diffuser member against said end face, said lip having an outer edge portion projecting beyond said end face to facilitate manual engagement with said diffuser member for removing the same, and a one-piece retainer ring comprising a cylindrical attachment wall having an internal shoulder surrounding and defining a spray outlet for registry with said flow passage outlet, said last-mentioned shoulder providing a planar end face surrounding said spray outlet and integrally carrying internal support ribs spanning said spray outlet to present abutment faces coplanar with said last-mentioned end face for reinforcing and preventing streamwise displacement of said central portion by pressure of liquid flowing therethrough, said attachment walls carrying interengaging, manually releasable fastening means for mounting said retainer ring on said bell, with said end faces in parallel gripping relation against opposite sides of said lip.

2. The arrangement of claim 1 wherein said fastening means comprise interengaging pivot ears carried on said attachment walls at one side thereof, and manually releasable interengageable nut and bolt members carried on said walls on a side thereof opposite from said first-mentioned side.

3. The arrangement of claim 1 wherein said fastening means comprise interengaging threaded surfaces formed integrally on said attachment walls with the threaded surface on the attachment wall of said bell being external and the threaded surface on the attachment wall of said retainer ring being internal and wherein the attachment wall of said bell is formed with an annular groove opening externally thereof and in a direction towards said retainer ring and the attachment wall of said retainer ring projects into said last-mentioned groove.

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