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(54) Swivel nozzle, in particular for use in saunas and similar equipment.

(57) Swivel nozzle of an improved type, particularly for use in connection with saunas or similar equipment, comprising a body (1) which is provided with a cavity connected with the source supplying the working medium, and which houses an insert (5) provided with perforations (6) for the working medium to flow out. The insert (5) is mounted in the body (1) by means of an elastic element (8) that rests against a pin (4) which is provided integrally inside the body (1).

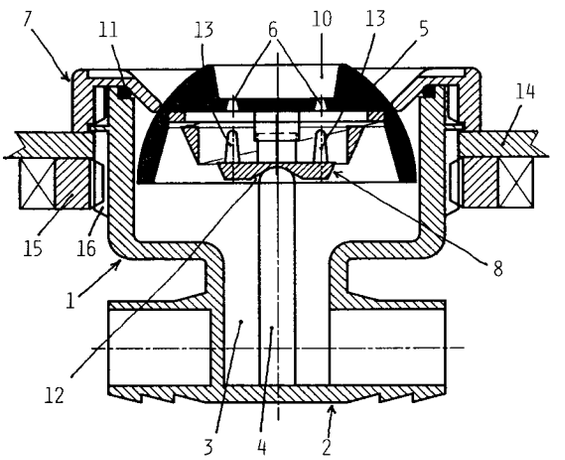

FIG. 1

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This invention relates to an improvement in a swivelling type, orientable nozzle particularly suitable for use in saunas and similar equipment calling normally for the delivery of steam.

Various types of nozzles are commonly known to be suitable for use in such equipment as whirlpool bath-tubs, shower cabins, etc. However, all such nozzles are rather complicated since they require the availability of inner conduits which shall enable different liquors and gases to be both mixed and/or excluded selectively. They may also require check valves to be appropriately included or built-in to prevent the liquor circulating in the equipment from becoming contaminated; they further require continuous maintenance for cleaning purposes.

A swivel-type, relatively uncomplicate nozzle for mixing air and water in applications in connection with a shower booth is disclosed in the Italian utility model no. 0 216 885.

This nozzle is formed by a body in which a seat is provided to partially accomodate, in a swiveling manner, an insert provided to eject the liquor under pressure. Said insert is essentially spherical in its shape and comprises internally conduits that flow into corresponding perforations in the outer surface of the insert to generate the jets of liquor. Each one of said conduits contains an injector through which air is drawn in owing to the effect of water flowing through the same conduit. The insert itself is kept in position in its seat by means of a threaded ring that is screwed on to the body, while a water-tight sealing ring is mounted between the insert and its seat.

The main drawback of such a nozzle derives from the fact that it is tightly restrained in its seat, since it can only rotate there, and that the outer surface of the spherical insert rubs, with a definite friction effect, against both the sealing ring and the inner edge of the fastening ring. As a consequence, through a prolonged use in time of the nozzle, the possibility of swiveling the nozzle, ie. its orientability, decreases to a considerable extent due to scale building up inside the nozzle itself and on the contact surfaces, making it necessary to increase the frequency of cleaning. Such a problem, on the other hand, usually arises also in connection with other types of nozzles, to an ever increasing extent as the complexity of these nozzles augments.

It therefore is a purpose of the present invention to provide an improved nozzle of the swiveling type which is such as to eliminate the above cited drawback typical of known types of nozzles, and which is furthermore very simple in its construction, very convenient to use and fully reliable in operation.

The features and characteristics of the nozzle according to the present invention are substantially as specified in the appended claims.

The advantages and the features of the nozzle according to the present invention will however become clearly apparent from the description that will be further given below, by way of non-limiting example, with reference to the accompanying drawings in which:

- Figure 1 is an enlarged sectional view along the axis of the nozzle according to the present invention;
- Figure 2 is a cross-sectional view from the top of a particular component part of the nozzle according to the present invention;
- Figure 3 is a cross-sectional view from the top of a further component part of the nozzle according to the present invention.

The nozzle shown in the Figures is substantially constituted by following elements:

- a body 1, having preferably the shape of a cylindrical cup and being made integral with a one-way or multiple-way connection fitting 2 for the connection to the delivery piping supplying the working medium (ie. steam, in the case of sauna equipment); said body 1 is communicating with said fitting 2 through an inner conduit 3 in which an axial pin 4 is provided integral therewith;
- a substantially semi-spherical insert 5 which has its hollow section facing said conduit 3 and is provided with through-perforations 6 communicating with the conduit 3 so as to enable the working medium to flow out;
- an annular locknut 7, which is screwed on to the aperture of the body 1 opposite to the fitting 3 and against which rests the semi-spherical surface of the insert 5;
- an elastic element 8 resting against the pin 4 and capable of pressing the insert 5 against the locknut 7.

In particular, the insert 5 has, on its side from which the working medium flows out, a recess 10 on the bottom surface of which perforations 6 are drilled. In a most advantageous way, the aperture of the recess 10 is flush with the outer profile of the annular locknut 7. Furthermore, between the annular locknut 7 and the outer edge of the body 1 there is provided an annular sealing gasket 11.

Said elastic element 8 is in a preferred way constituted by a plastic spring being frusto-conical in its shape and having a base 12 that is closed and recessed so as to constitute a seat for the element to rest upon the pin 4. Inside said base 12, on the side which is opposite to the one matching with the pin 4, three tips 13 are provided integrally therewith, said tips extending axially with the perforations 6 of the insert 5 and being adapted to move into said perforations when the insert 5 is pressed against the inner side of the body 1, so as

to perform a self-cleaning of said perforations 6 when the nozzle is operating.

In older to ensure that the tips 13 are correctly and precisely aligned with the corresponding perforations 6, inside said insert 5 and said spring 8 there are provided, respectively, a projecting seat 51 (Figure 2) , being preferably triangular in its cross-section, and a projecting pin 81 (Figure 3), being also correspondingly triangular in its cross-section, so as to couple the spring and the insert with the correct orientation.

The nozzle 1 is mounted in an opening in the wall 14 of the equipment and is fastenend thereto by means of the annular locknut 7 and a further locknut 15, which is screwed on to the outer surface of the body 1 and is provided with a corresponding threading 16.

As it can be inferred from the above description, the nozzle according to the present invention is extremely simple in its construction, featuring a relatively small number of mouldable plastic component parts. It further turns out to be very convenient and reliable in its use.

As a matter of fact, the insert 5 is mounted elastically in the body 1 and its orientation can be performed, ie. it can be swivelled, under a minimum of friction. Furthermore, when the nozzle is operating, the perforations 6 of the insert 5 are cleaned in a practically automatic way thanks to the presence of the tips 13 inside the spring 8.

It will be appreciated that the embodiment of the present invention that has been described above by way of non-limiting example may actually be the subject of any modification considered appropriate, for instance by providing an elastic element 8 with a different shape, or a different coupling of said elastic element 8 with the pin 4, without departing from the scope of the present invention, as far as an equivalent result is achieved. In fact, the actual innovatory concept of the invention lies substantially in having the insert 5 mounted elastically inside the body 1.

Claims

1. Swivel nozzle of an improved type, particularly for use in connection with saunas or similar equipment, comprising a body (1), which is connected with the supply of working medium, and an insert (5) provided with perforations (6) for the working medium to flow out, said insert (5) being housed inside said body (1) and being retained in its seat by an annular locknut (7) screwed on the aperture of said body (1), **characterized in that** the insert (5) has a substantially semi-spherical shape and is mounted in the body (1) by means of elastic means (8) acting in contrast with a matching element (4) provided inside the body (1).

2. Nozzle according to claim 1, **characterized in that** said matching element is constituted by a pin (4) provided axially inside the body (1), and that said elastic means are constituted by a spring (8) having a frusto-conical shape and provided with a seat (12) for coupling with said pin (4).

3. Nozzle according to claim 1 or 2, **characterized in that** said spring (8) is provided integrally with a plurality of tips (13) that correspond axially to the perforations (6) of the insert (5).

4. Nozzle according to any of the preceding claims from 1 to 3, **characterized in that** said insert (5) and said spring (8) are coupled with each other by means of a seat (51) and a pin (81) which are provided integrally in the insert and the spring, respectively.

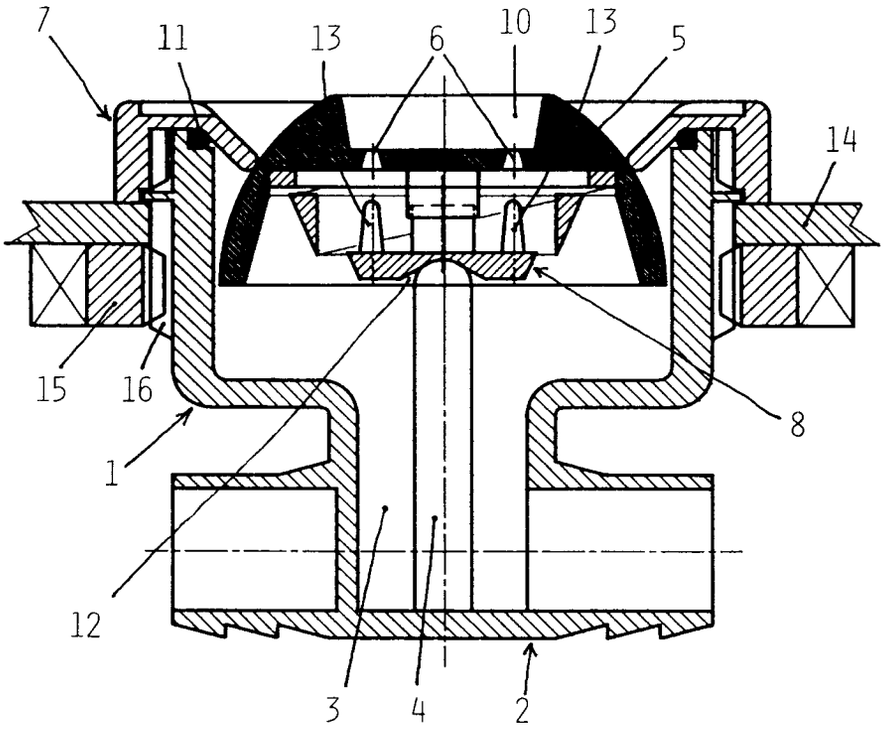
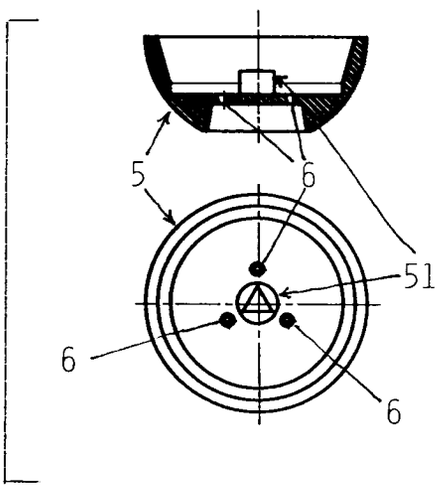


FIG. 1

FIG. 2



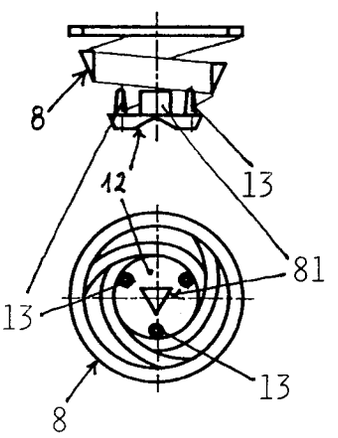


FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 93 11 6767

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	US-A-3 677 474 (LORENZEN) * the whole document * ---	1	B05B15/06 B05B15/02
A	US-A-2 196 783 (SHOOK) * the whole document * ---	1	
A	GB-A-2 210 566 (CARADON MIRA LIMITED) * page 13, line 19 - page 14, line 27; figures 1,2 * -----	2-4	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

B05B
A61H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	7 February 1994	Juguet, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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