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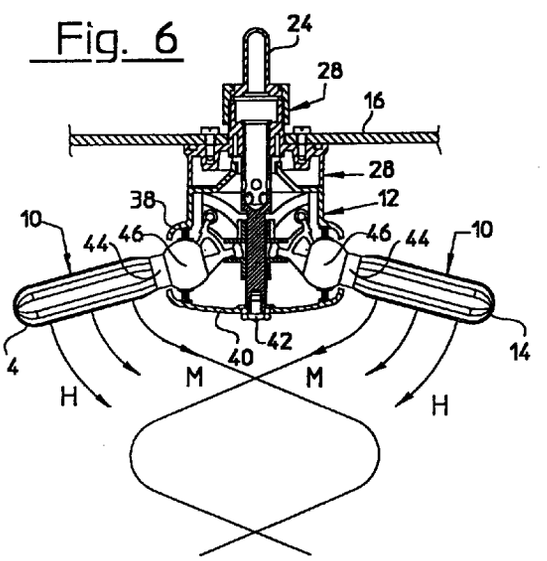
(54) Shower assembly with delivery nozzles wich can be oriented about their longitudinal axis and displaced into mutually converging or diverging positions

(57) The invention describes a shower assembly comprising a plurality of water delivery nozzles or arms (10), which are essentially radial and angularly staggered with respect to one another and which are mounted on a rotor (12) supported in a freely rotatable manner by generally stationary support means (18). The water delivery nozzles or arms (10) can be oriented with respect to said rotor (12) both about their longitudinal axes and into mutually converging or diverging positions. In these latter positions, when the emission of the water flows from said nozzles is inclined with respect to the vertical, rotation of the delivery nozzles (10) about a substantially vertical axis is caused.

Fig. 6



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Description

The present invention relates to a shower assembly comprising a plurality of substantially radial delivery nozzles which can be oriented about their longitudinal axes and displaced into mutually converging or diverging positions.

Said delivery devices for showers are known and may be classified into two distinct categories.

A first type of shower delivery device is that where the associated nozzle is fixed to the wall or made integral therewith by means of a support element which projects from said wall.

Delivery devices of this type are also provided with means for adjustment of the jets of water which emerge therefrom so that these jets may be varied in intensity and regulated so as to be pulsed or have variable delivery flow rates by modifying the exit cross-section of the water from the emission holes of the delivery device.

These delivery devices, although offering generally satisfactory performances owing to the aforementioned means which are known per se and hence not described in detail, have the major drawback due to the fact that the overall flow of water emerging from the delivery device has a fixed direction so that the performance of these delivery devices, in particular as regards the distribution of the water onto the user, is limited.

Another type of shower delivery device of the known type is that commonly known as a "handset" type delivery device or shower head which offers two methods of use as specified hereinbelow.

A first possibility of using the shower head consists in arranging it on suitable wall-mounted support means and then operating the delivery system of the shower. In this way the overall water flow emitted by the shower head will be stationary and it will be possible to modify the direction thereof only by periodically displacing manually the shower head, modifying the position thereof since the associated support means can be oriented in this way.

A second possibility of using the shower head consists in removing it from the aforementioned support means and, once it has been gripped manually, the user is able to direct the jet of water as required in accordance with needs and his/her wishes.

However, in this case the use of the shower head has a drawback consisting in the fact that the user must manually grip the shower head and this drawback is certainly not insignificant since in this case he/she will always have one of his/her hands occupied, thus limiting considerably his/her freedom of movement.

A shower assembly has now been devised, and forms the subject of the present invention, in which all the drawbacks mentioned above may be eliminated and which, in particular, as will become more apparent below, has the following innovative features:

- the assembly has a plurality of delivery nozzles which are angularly staggered with respect to each other and can be supplied simultaneously with water;
- the delivery nozzles according to the above paragraph can be oriented both about their longitudinal axis and along a substantially vertical plane;
- the means which support said delivery nozzles are rotatable about a substantially stationary central support and, when the nozzles are displaced along said vertical plane so as to be arranged diverging or converging with respect to one another, the shower assembly, and hence the delivery nozzles, will he rotated as explained in detail below, generating a flow of water whose direction is continuously variable.

Therefore one of the main objects of the present invention is to provide a shower assembly with several delivery nozzles or arms which project radially from a central support, the position of which nozzles or arms may be suitably modified with respect to said support so as to obtain, from each of them, a flow of water at an angle which may be modified. When the flows are substantially vertical, the aforementioned nozzles remain stationary and deliver a flow in the preselected direction.

A further object of the present invention is to provide a shower assembly as specified above, in which the delivery nozzles or arms can be oriented about their longitudinal axes and, when the water flow is generated by them, whether they be in a diverging position or converging position other than the vertical, they will be made to rotate owing to the same reaction of the various flows of water which strike the walls of the environment in which the assembly is installed or the user directly.

Last but not least, an object of the present invention is to provide a shower assembly in which the nozzles are interconnected with each other by suitable means which transmit the movement from one delivery arm to the other so that it is necessary to modify and adjust only the position of one of them, the position of the remainder consequently being modified and adjusted in synchronism.

It is also necessary to underline the characteristic feature consisting in the fact that the aforementioned means also ensure the simultaneous and synchronised rotation of all the delivery nozzles or arms.

The present invention therefore relates to a shower assembly which is characterized by the fact that it comprises a plurality of water delivery nodes or arms which are mounted on a rotor supported in a freely rotatable manner by support means which are generally stationary, said water delivery nodes or arms being able to be oriented with respect to said rotor both about their longitudinal axes and into positions converging or diverging with respect to one another in which emission of the flows of water from said nozzles causes rotation of the latter.

The characteristic features as well as the advantages of the shower assembly according to the present invention will be obvious from the following detailed description of a non-limiting embodiment thereof, a description which will be provided with reference to the accompanying figures in which:

Figure 1 is an overall schematic side view of the shower assembly according to the present invention;
Figure 2 is a view of the shower assembly according to Figure 1 along the section II-II of the same figure;
Figure 3 is a schematic, longitudinally sectioned side view of the shower assembly according to the invention in which the delivery nozzles are diverging and oriented so as to generate a substantially vertical flow of water inclined in the preselected direction;
Figure 4 is a view similar to that of Figure 3, in which the delivery nozzles or arms, still in a mutually diverging position, have been further oriented about their longitudinal axis so that the flow of water generated by them is inclined, still in the desired direction, also with respect to the vertical;
Figure 5 is a view similar to that of Figure 3 illustrating the delivery nozzles or tubes in a converging position;
Figure 6 is a view similar to that of Figure 4 in which the delivery nozzles or tubes, still in the mutually converging position, have been further oriented about their longitudinal axes;
Figure 7 is a schematic side view, longitudinally sectioned and on a larger scale, of the shower assembly according to the present invention in which, solely by way of illustration, a first nozzle has been shown oriented downwards, while the second device is illustrated oriented upwards;
Figure 7a is a view of the shower assembly according to the invention along the section VII-VII of Figure 7;
Figure 8 is a view of the shower assembly according to the invention along the section VIII-VIII of Figure 7;
Figure 9 is a view of the shower assembly according to the invention along the section IX-IX of Figure 7;
Figure 10 is a view similar to that of Figure 7 of a modified embodiment which corresponds to Figures 3 to 6 in which, again solely by way of explanation, two nozzles are shown with one directed upwards, and the other one oriented downwards;
Figure 11 is a schematic side view, partially longitudinally sectioned, of a delivery nozzle or tube;
Figure 12 is a schematic front view, partially transversely sectioned, of a delivery nozzle or tube.

It must be stated first of all, solely for the sake of completeness of reference, that the definitions, given above, of "diverging" nozzles (Figure 3) and "converging" nozzles (Figure 5) must be understood as referring to the relative direction of the flows of water emitted from the aforementioned delivery devices.

In the embodiments provided in the description which follows, the fixed wall to which the shower assembly according to the present invention is fixed may be considered for example as the upper wall or "roof" of a shower unit, but it is obvious that this wall may also form part of any configuration of a shower environment, so that the example of the shower unit must obviously not be regarded as limiting the invention.

With particular reference first of all to Figures 1 and 2, the shower assembly according to the present invention comprises a series of delivery nozzles, which are each indicated in their entirety by 10 and which, in the examples of embodiment considered, are three in number.

The delivery nozzles 10 are arranged substantially radially equidistant from one another and hence with their longitudinal axes arranged at 120° from one another.

The delivery nozzles 10 are supported in such a way that they may be oriented, as will be explained below, by a rotor denoted in its entirety by 12 which is supported in a freely rotatable manner about a substantially vertical axis by a fixed wall 16 which may be advantageously a wall of the type indicated above.

With reference now also to the remaining accompanying figures, and in particular to Figure 11 which shows in detail one of the aforementioned nodes 10, it can be seen that the said nozzles consist of an essentially tubular body 14 of elongated shape which extends radially outside the rotor 12 and is provided, in its part inside the said rotor 12, with means which allow different orientations thereof at the same time, as explained below and which perform the aforementioned displacements of the nozzles 10 in synchronism with one another.

The fixed part 18 of the shower assembly according to the invention is fixed in a manner known per se to the wall 16 by means of locking screws 20 and the intervening arrangement of a seal 22.

The shower assembly according to the invention receives the water to be delivered in a known manner by means of a supply duct, shown schematically and indicated at 24, which is connected on the one hand to a source supplying hot and/or cold water (not shown), while at the end connected to the shower assembly according to the invention, this duct 24 is connected by means of a stationary ring 28 and a seal 26 to the stationary portion 18 to which there is also rigidly connected the top end of a tubular shaft 30 which is closed at its bottom end and which, by means of holes 32 with which it is provided, conveys the water to inside the rotor 12 so that it may be introduced into the delivery nozzles 10. The rotor 12, by means of a thrust-bearing bush 31, is rotatable about the tubular shaft 30.

With reference now to Figure 11, but considering also Figures 7 and 10, it can be understood that each nozzle 10 is provided, along its generatrix line, with a series of water delivery holes 34, from which water jets will emerge, the direction of said jets depending on the orientation imparted to the nozzle 10.

Still with reference to the aforementioned figures, it can also be seen that the external surface of the body of the nozzle 10 is provided with a plurality of longitudinal grooves 36 intended to ensure more efficient holding and gripping of the nozzle 10 by a user when he/she wishes to impart a rotation thereto about its longitudinal axis. Obviously this feature also applies to the case where the user wishes to displace angularly the aforementioned nozzles 10.

Still with particular reference to Figures 7 and 10, but taking into account in this case also Figures 2 to 6, it is possible to note that the rotor 12 is composed of two shaped cover-pieces, the upper one of which is indicated by 38, while the lower one is indicated by 40. These cover-pieces are connected together in any known manner not shown, for example, by means of connecting screws, a snap-engagement connection between the edges of said cover-pieces, bonding or the like. The rotor 12, thus assembled, is supported by a screw 42 or the like which is screwed into the bottom end of the tubular body 30 supporting the rotor 12 during its rotations.

As can be seen from Figures 7, 10 and 11, the end of the body of the nozzles 10 which is arranged towards the inside and inside the rotor 12 is shaped. More precisely this end has in particular a cylindrical portion 44 which is connected to an enlarged end or "head" 46 of the nozzle 10, the part of which in contact with the rotor 12 has a mainly semi-spherical shape, while at its ends, said head 46 is substantially flat with substantially parallel surfaces.

More precisely, the head 46 is supported rotatably, so as to modify the direction and position of the nozzles 10, by an annular support element 48 provided with a seal, not shown, the external contour of which houses cover-pieces 38 and 40 in a suitable seat 50 of annular shape, while the opposite end is shaped in a complementary manner to the head 46 so as to allow the desired rotations thereof both about the longitudinal axis of the nozzle 10 and along planes substantially perpendicular to the axis of rotation of the rotor 12.

The head 46 of the nozzle 10 (Figure 11) is provided with a longitudinal passage 47 for introduction of water inside said nozzle.

With particular reference now to Figures 7 and 11, it can be seen that, in the rear part of the head 46 of each nozzle 10, two substantially rectilinear lugs are provided, indicated by 52 and 54 respectively.

More particularly, the first of said lugs, the one indicated by 52, extends with its longitudinal axis along the extension of that of the nozzle 10, while the second of said lugs, the one indicated by 54, extends with its longitudinal axis inclined at a predetermined angle with respect to the longitudinal axis of the nozzle 10.

The lugs 52 and 54 are connected, integrally with one another, in an intermediate zone of their length, by a portion 56 with an essentially curvilinear profile having the form of a circular rim.

Both the free ends of said lugs 52 and 54 have an enlarged part which, with regard to the lug 52, is essentially disk-shaped and is indicated by 58, whereas that of the second lug 54, indicated by 60, has an essentially spherical shape.

The aforementioned enlarged parts 58 and 60 are housed in suitable seats of a composite sleeve indicated in its entirety by 62.

The composite sleeve 62, as can be seen in particular from Figure 7, comprises an internal portion, indicated by 64, which has an essentially cylindrical annular shape and which is arranged on the body of the tubular shaft 30 with the possibility of longitudinal translations and rotations about the same.

The internal portion 64 of the composite sleeve 62 is connected to a second sleeve portion 66 which also has an annular and cylindrical shape and which is arranged essentially offset upwards with respect to the internal portion 64, being in any case coaxial therewith.

The internal portion 64 of the composite sleeve 62 is provided with an essentially annular projection indicated by 69, inside which the enlarged part 58 of each lug 52 of the nozzle 10 is housed, with the possibility of rotation alone.

The aforementioned arrangement allows rotations to be imparted to the nozzle 10 about its longitudinal axis so as to orient the same and hence its delivery holes 34, in different directions from the vertical to others inclined with respect to the latter.

The enlarged part 60 of the lug 54 is housed in a radially displaceable manner in a seat of the external sleeve portion 66 delimited by two radial walls 68 which are parallel with one another and inside which said enlarged part 60 is able to move when the nozzle 10 is displaced in a substantially vertical direction, as illustrated by way of example in Figure 7 for the downwards oriented left-hand nozzle which is displaced into the position of the right-hand nozzle 10 oriented upwards. In this way, in the example considered here, the composite sleeve 62 is displaced from a substantially raised position (that shown on the left in the figure in question) into a lowered position (that shown on the right of the same figure).

A fork-shaped wall 59 integral with the cover-piece 40 of the rotor 12 guides the rotations and vertical displacements of the lug 52.

The displacements considered here of the nozzles 10 are delimited by end-of-travel stops consisting, in the embodiment in question, of the contour of openings 70 delimited by the inwardly curved contour of facing concave parts provided on the upper cover-piece 38 and lower cover-piece 40. The substantially vertical rotation

of the nozzles 10 is therefore stopped when the portion 44 of the same engages with the contour 70 of the aforementioned openings.

From the above description it is obvious that the aforementioned raising or lowering movements, i.e. the rotation of the nozzles 10 downwards or upwards is performed in synchronism with one another since all the enlarged parts of the lugs 52 of said nozzles 10 are housed in the seat 69 of the composite sleeve 62. In this way, when one of these nozzles 10 is moved, from example, from the lowered position, relating to the left-hand node 10 of Figure 7, to the raised position, of the right-hand nozzle of the same figure, the remaining two nozzles 10 therefore undergo the same displacement. This characteristic feature is clarified in particular by considering, in combination, Figure 2 in relation to Figure 7 which is now described in detail.

A similar situation of synchronised movement of the nozzles 10 occurs when one of the latter is made to perform a rotation about its longitudinal axis which is transmitted to the remaining two nozzles since the external sleeve portion 66 is also formed as one piece and the associated seats delimited by its walls 68 are also arranged at 120° from one another with respect to the longitudinal axis of the tubular shaft 30 (Figure 7a).

Therefore, when a nozzle 10 is made to rotate about its longitudinal axis, a corresponding rotation is imparted to its lug 54 and this rotation is transmitted to the remaining two nozzles 10 owing to the rotation of the external sleeve portion 66 of the composite sleeve 62, the walls 68 of which transmit the aforementioned rotation to the projecting parts 60 of the other two nozzles 10.

With particular reference now to Figures 3 to 6 and Figure 10 in particular it is possible to see a variation of embodiment of the shower assembly according to the present invention which, in terms of its general features, is substantially the same as the first embodiment described above in detail. The differences of the embodiment with respect to the first embodiment will therefore be only briefly considered hereinbelow.

First of all, the composite sleeve which connects the nozzles 10 together and mutually transmits rotation thereof - again indicated in its entirety by 62 - is made of two parts which are separate from one another and, more precisely, a first sleeve, again indicated by 64, which has formed in it the seat 69 housing the enlarged parts 58 of the nozzles 10, and a second sleeve 66, coaxial with the first sleeve 64, which is provided, in its upper part, with three pairs of flat walls 68 inside each pair of which an enlarged part 60 of a node 10 is housed in a slidable and substantially radial miner.

In this case, as it is possible to see in particular from Figure 12, the enlarged parts 60 of the lugs 54, instead of having a spherical shape, are formed in a substantially spherical manner in their central part which extends at the ends into parts of essentially cylindrical shape, the ends in contact with said walls 68 being slightly rounded.

A further difference consists in the fact that, whereas in the first embodiment, the walls 68 of each pair of the second sleeve are not connected transversely to one another, the corresponding walls 68 of the sleeve 66 of the variation of embodiment are connected together at the top by a curved wall 71 which allows displacement, radially and simultaneously upwards, of the enlarged parts 60 of the nozzles 10.

As it is possible to see in particular from Figure 10, but observing also Figures 3 to 6, the first sleeve 64 has two possibilities of movement and in particular a vertical translation movement, which is that shown in detail in the aforementioned figures, and a rotational movement about a substantially vertical axis which is not shown in the figures in question, but which can be deduced by observing Figure 2.

The second sleeve 66, which in this case is arranged inside the first sleeve 64 and hence directly in contact with the tubular shalt 30, has only one possibility of displacement and more precisely that of rotation about a substantially vertical axis. This sleeve, moreover, is substantially stationary since its upper and lower ends make contact respectively with the upper cover-piece 38 and the lower cover-piece 40 of the rotor 12, so that this sleeve 66 is not displaceable vertically.

The remaining part of the variation in embodiment according to Figure 10 is not described in detail since, as specified further above, its form and structure are essentially identical to that of the first embodiment according to Figure 7.

The above description clearly reveals the considerable advantages and the extreme versatility of use of the shower assembly according to the present invention, as described hereinbelow in its essential features, with particular reference to Figures 3 to 6.

Figures 3 and 5 in particular show the delivery nozzles 10 with the outlet holes 34 in a vertical position so that the jets of water emerging from them are correspondingly directed.

From a position, not shown in detail since it may be deduced from those positions illustrated, in which the nozzles 10 are essentially horizontal so that all the water jets originating from them are correspondingly vertical and parallel with one another, it is possible to orient the jets 10 upwards (Figure 3) so that, in this position, the aforementioned water jets are diverging with respect to one another, as indicated schematically by the arrows F in Figure 3.

In addition (Figure 5) it is possible to orient the jets 10 downwards so that the water jets emitted by them have a substantially converging direction as indicated schematically by the arrows G of Figure 5.

In all the cases considered here the nozzles 10 are stationary, remaining in the position into which they moved, since there is no transverse pressure component of the abovementioned jets which causes rotation thereof about a vertical axis as specified hereinbelow

with particular reference to Figures 4 and 6.

With reference to the aforementioned figures, in this case also, the nozzles 10 may be oriented upwards (Figure 4) or downwards (Figure 6). Furthermore, a rotation of a predetermined and desired amplitude is now imparted to the nozzles 10 about their longitudinal axes, as a result of which the water jets emitted by them are inclined with respect to the vertical as indicated schematically by the arrows H in Figures 4 and 6.

The aforementioned orientation therefore produces a transverse pressure component exerted by the jets referred to above, whether they be oriented towards the user as illustrated in Figures 4 and 6, or whether they be directed upwards against the fixed wall 16. In this way, owing to the aforementioned transverse pressure component of the water jets, the nozzles 10 are made to rotate in one of the two directions indicated schematically by the double arrow L of Figure 2 depending on the orientation imparted to them.

In this situation, particularly when the water jets are oriented towards the user, i.e. downwards as schematically indicated in Figures 4 and 6, a plurality of groups of jets, one for each nozzle 10, will be generated so that each group of jets is distributed overall in the manner of a helix, as schematically indicated by the arrows M of Figures 4 and 6.

Finally, in Figure 1, the arrows N schematically indicate two of the possible orientations of the water jets of the nozzles 10 with respect to the vertical direction.

The above comments made with regard to the first embodiment of the shower assembly according to the invention are obviously valid for and may be extended to the embodiment according to Figure 10. Therefore, that illustrated in particular in Figures 3 to 6 must be considered as being applicable also to this variation of embodiment.

Finally, structurally and functionally equivalent variations and/or modifications may be made to the shower assembly according to the present invention as described above and illustrated in the accompanying drawings without thereby departing from the scope of the invention.

Claims

1. Shower assembly, characterized in that it comprises a plurality of water delivery nozzles or arms (10) which are mounted on a rotor (12) supported in a freely rotatable manner by generally stationary support means (18), said water delivery nozzles or arms (10) being able to be oriented differently with respect to said rotor (12) both about their longitudinal axes and into mutually converging or diverging positions in which emission of the flows of water from said jets (10) causes rotation of the latter.

2. Shower assembly according to Claim 1, characterized in that said water delivery nozzles or arms (10) are arranged in an essentially radial manner with respect to said rotor (12) from which they project outside thereof angularly equidistant from one another.

3. Shower assembly according to Claim 1, characterized in that, when said water delivery nozzles or arms (10) are oriented so as to each generate a substantially vertical flow of water, said nozzles (10) are stationary.

4. Shower assembly according to Claim 3, characterized in that, when the flows of water emitted from the nozzles (10) are substantially vertical, the nozzles themselves (10) are stationary both in the case where said flows of water are parallel with one another and in the case where said flows are mutually converging or diverging.

5. Shower assembly according to Claim 1, characterized in that said nozzles (10) are made to rotate when they are oriented about their longitudinal axes so that the flows of water emitted from them are inclined transversely with respect to the vertical direction.

6. Shower assembly according to Claim 1, characterized in that said delivery nozzles or arms (10) are integral, during rotation, with said rotor (12).

7. Shower assembly according to Claim 1, characterized in that each of the nozzles (10) receives the water to be delivered from inside the rotor (12) which in turn receives it from generally stationary means which support it.

8. Shower assembly according to Claim 7, characterized in that said generally stationary support means which support the rotor (12) essentially consist of a substantially vertical tubular shaft (30) which is connected to a water supply duct (24) connected to a fixed portion (28) of the shower assembly with which said tubular duct (30) is also integral.

9. Shower assembly according to Claim 8, characterized in that said tubular duct (30) is closed at its bottom end and is provided with a plurality of through-holes (32) for the introduction of water inside the rotor (12).

10. Shower assembly according to Claim 9, characterized in that each of the delivery nozzles or arms (10) consists of an essentially tubular body (14) which is closed at its free end outside the rotor (12) and is provided, inside its portion (46) arranged inside said rotor (12), with an essentially longitudinal passage (47) for the introduction of the water inside the tubular body (14).

11. Shower assembly according to Claim 10, characterized in that said portion (46) of each nozzles (10) has an essentially spherical shape and is supported by an annular support element (48) which is located inside said rotor (12) and which allows orientation of the tubular body (14) of the nozzles (10) both about its longitudinal axis and in a substantially vertical plane.

12. Shower assembly according to Claim 11, characterized in that the substantially vertical rotations of the body (14) of the nozzles (10) are limited by the contour (70) of openings with which the rotor (12) is provided and through which the said nozzles (10) project radially outside thereof from its openings (70).

13. Shower assembly according to Claim 10, characterized in that said portion (46) of the nozzles (10) is provided, in its rear part inside the rotor (12), with a first and second lug (52, 54) which project from said portion (46) and are angularly staggered with respect to one another and the end of each of which is housed in means which allow said rotations of the nozzles (10) about their longitudinal axis and along a substantially vertical plane, said means being connected by interconnecting means suitable for transmitting simultaneously said rotations from one of the nozzles (10) to the remainder of the series of the shower assembly.

14. Shower assembly according to Claim 13, characterized in that the longitudinal axis of the first lug (52) of each nozzle (10) coincides with that of the body (14) of the nozzle (10), while the longitudinal axis of the second lug (54) is inclined with respect to said longitudinal axis of the nozzle (10).

15. Shower assembly according to Claim 13, characterized in that said means for interconnecting the nozzles (10), inside the rotor (12) of the shower assembly, comprise a composite sleeve (62) which houses an enlarged portion (58) of said first lug (52) and an enlarged portion (60) of said second lug (54).

16. Shower assembly according to Claim 15, characterized in that said composite sleeve (62) is made as one piece and is provided with an essentially annular seat (69) projecting radially towards the inside of the rotor (12) housing in a solely rotatable manner the enlarged part (58) of each lug (52), said composite sleeve (62) being also provided with a series of pairs of walls (68) again projecting radially from said tubular shaft (30), inside each pair of said walls (68) there being displaceable in an essentially radial manner and in a substantially vertical simultaneous direction a projecting part (60) with which the end of the second lug (54) of the nozzle (10) is provided.

17. Shower assembly according to Claim 16, characterized in that it has a series of seats (68) identical in number to that of the nozzles (10) and angularly staggered in the manner of said nozzles (10).

18. Shower assembly according to Claim 16, characterized in that said composite sleeve (62) is freely rotatable about the tubular shaft (30) and is displaceable longitudinally along the same.

19. Shower assembly according to Claim 15, characterized in that said composite sleeve (62) is formed as two parts which are separate from one another, in particular a first sleeve portion (64) provided with said seat (69) for housing the enlarged parts (58) of the lugs (52) of the nozzles (10), and a second sleeve portion (66), inside the former, for housing the enlarged parts (60) of the lugs (54) of the nozzles (10).

20. Shower assembly according to Claim 19, characterized in that said first sleeve portion (64) of the composite sleeve (62) is freely rotatable and displaceable longitudinally along said tubular duct (30), whereas the second sleeve portion (66) is freely rotatable with respect to said tubular duct (30) while it is stationary longitudinally with respect to the latter.

21. Shower assembly according to Claim 20, characterized in that the upper and lower ends of the second sleeve portion (66) are in contact with the internal walls of the rotor (12) with the possibility of rotation in relation thereto about said tubular duct (30).

22. Shower assembly according to Claim 13, characterized in that said lugs (52, 54) of each nozzle (10) are essentially coplanar with one another, the rotation of the body (14) of the nozzles (10) about its longitudinal axis resulting in simultaneous rotation of the first lug (52) about its longitudinal axis and the consequent rotation of the second lug (54) about the longitudinal axis of the nozzle (10).

23. Shower assembly according to Claim 22, characterized in that the rotation of the body (14) of the nozzles (10) along a substantially vertical plane results in the simultaneous rotation of the lugs (52 and 54) of said body (14) along the same plane.

24. Shower assembly according to Claim 15, characterized in that the enlarged end part (58) of the first lug (52) of each nozzle (10) is essentially disk-shaped and is housed inside the seat (69) of the first sleeve portion (64) with the possibility of rotation alone

inside the same about its longitudinal axis.

25. Shower assembly according to Claim 15, characterized in that the enlarged end part (60) of the second lug (54) has an essentially spherical shape.

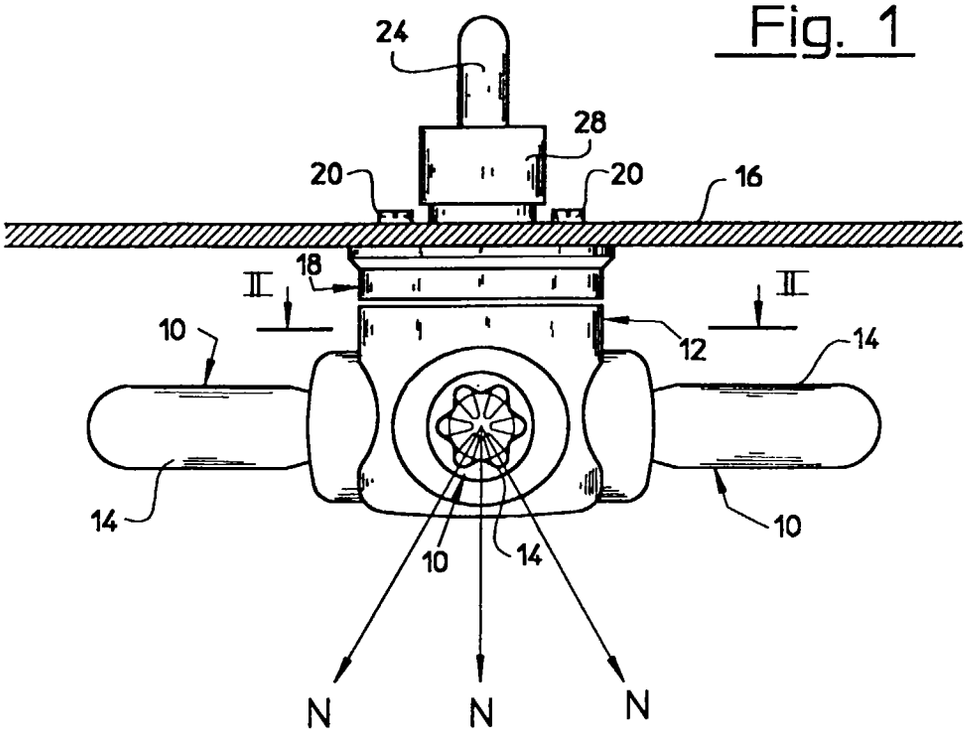
26. Shower assembly according to Claim 15, characterized in that said end portion (60) of the second lug (54) of the nozzles (10) has a substantially spherical shape centrally and is extended laterally, in a substantially diametral plane, into two essentially cylindrical portions, the ends of which making contact with the walls (68) of the respective seat of the second sleeve (66) are curved outwards.

27. Shower assembly according to Claim 10, characterized in that the external surface of the body (14) of the nozzles (10) is provided with a series of longitudinal grooves (36) substantially parallel with one another.

28. Shower assembly according to Claim 10, characterized in that the holes (34) for emission of the water from the nozzles (10) are arranged along a generatrix of the body (14) of the latter.

29. Shower assembly according to Claim 1, characterized in that the water delivery nozzles or arms (10) are arranged in a single essentially transverse plane of the rotor (12).

Fig. 1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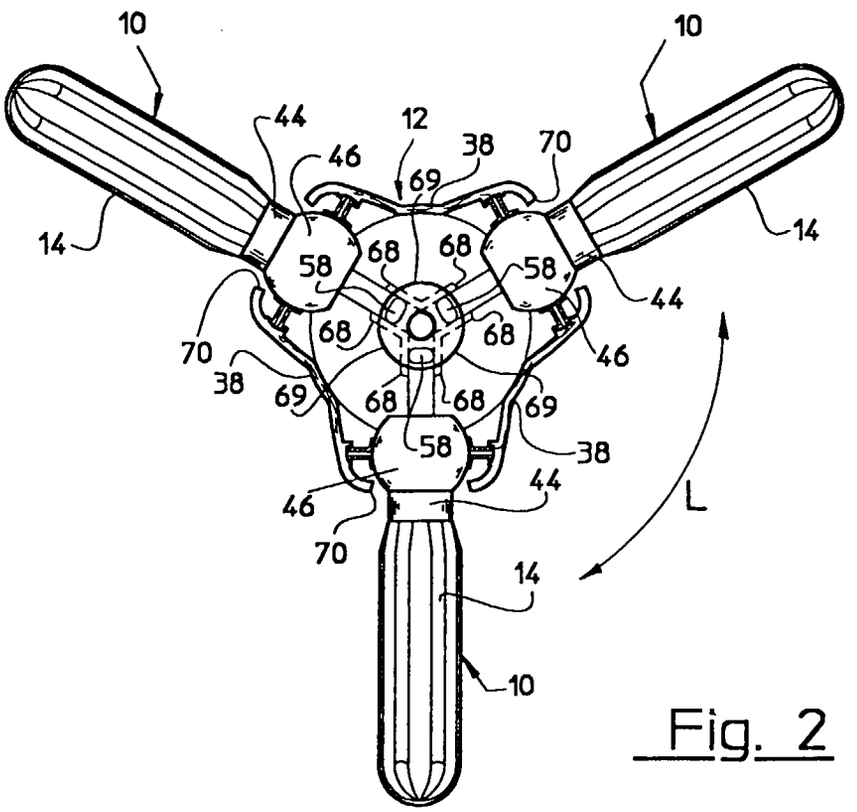
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Fig. 2

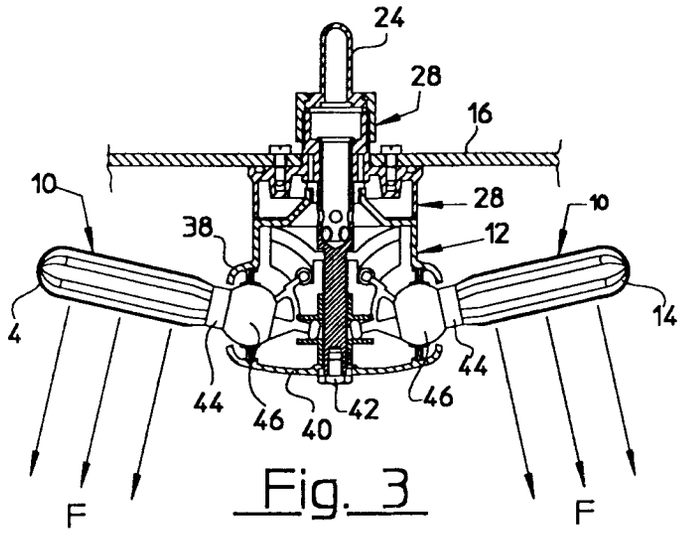

Fig. 3

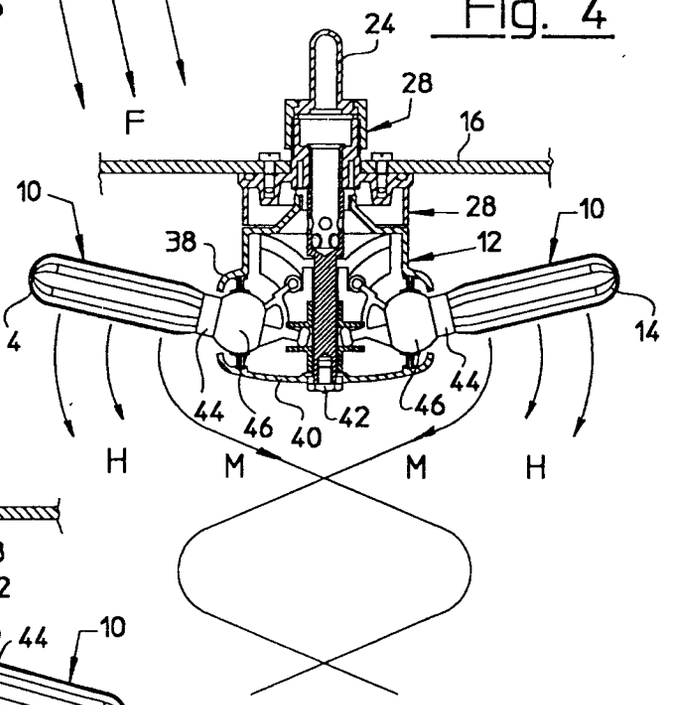

Fig. 4

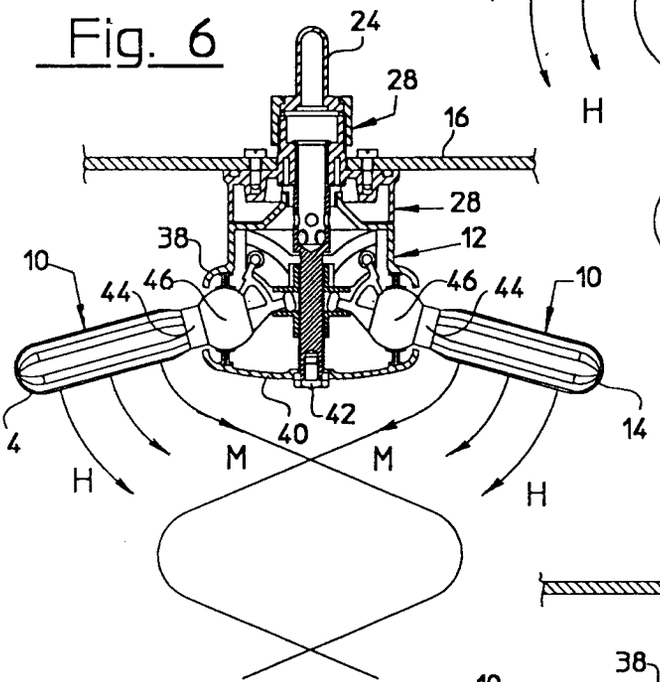

Fig. 6

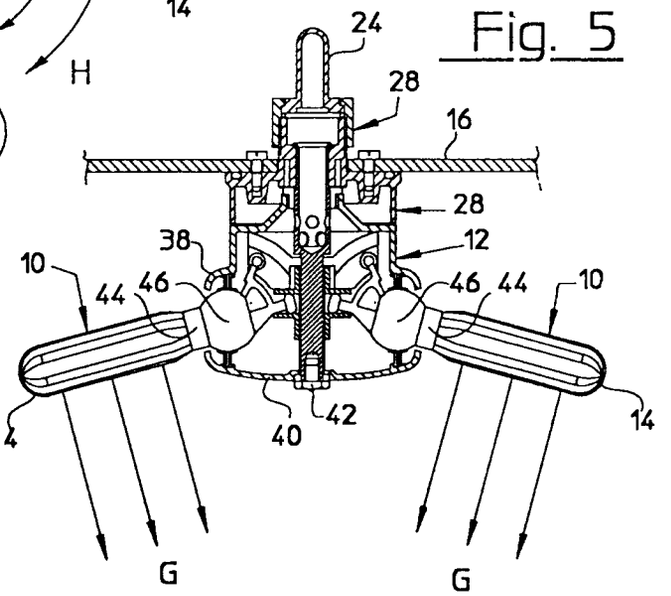

Fig. 5

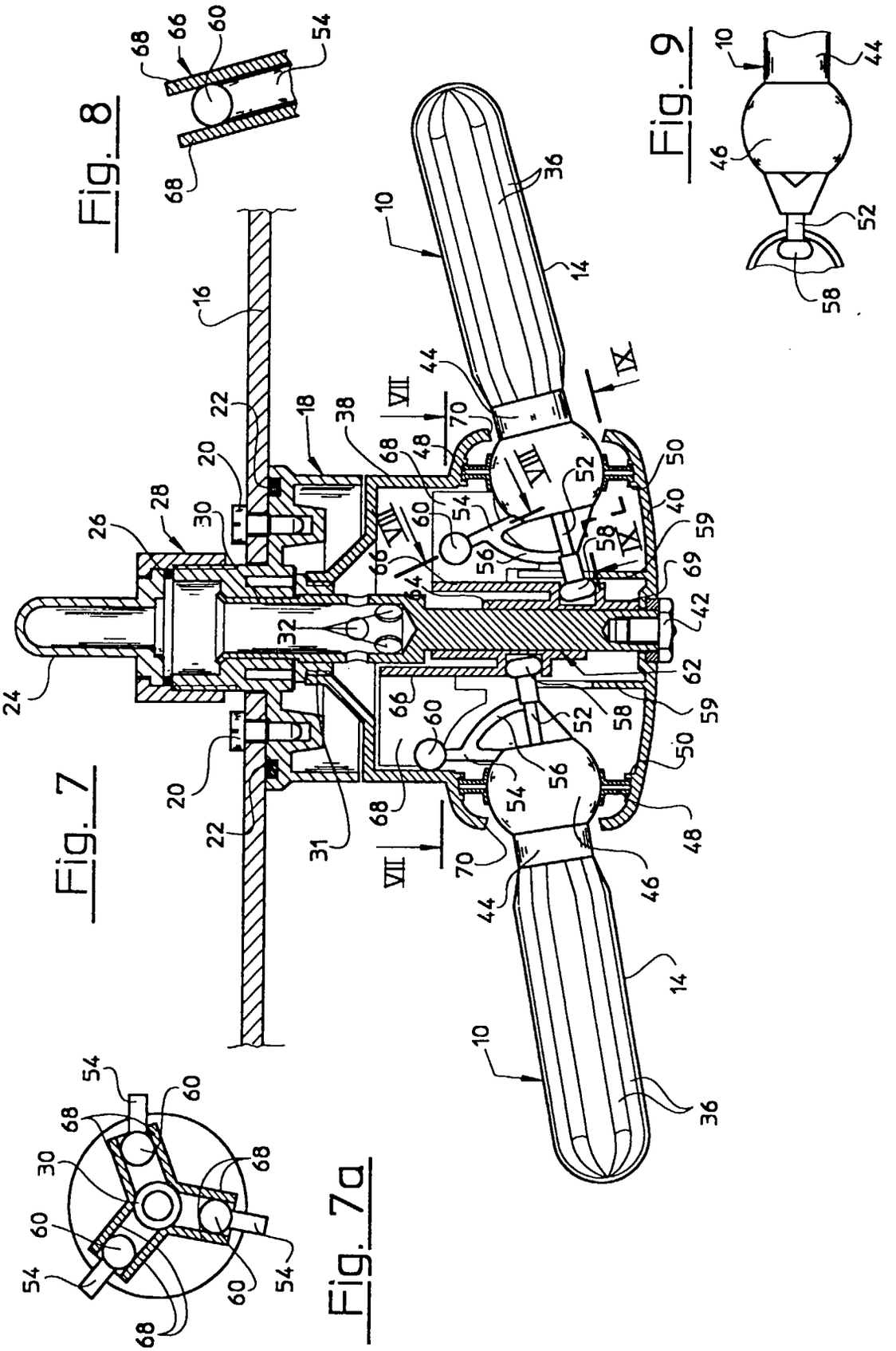
Fig. 8
Fig. 9
Fig. 7
Fig. 7a

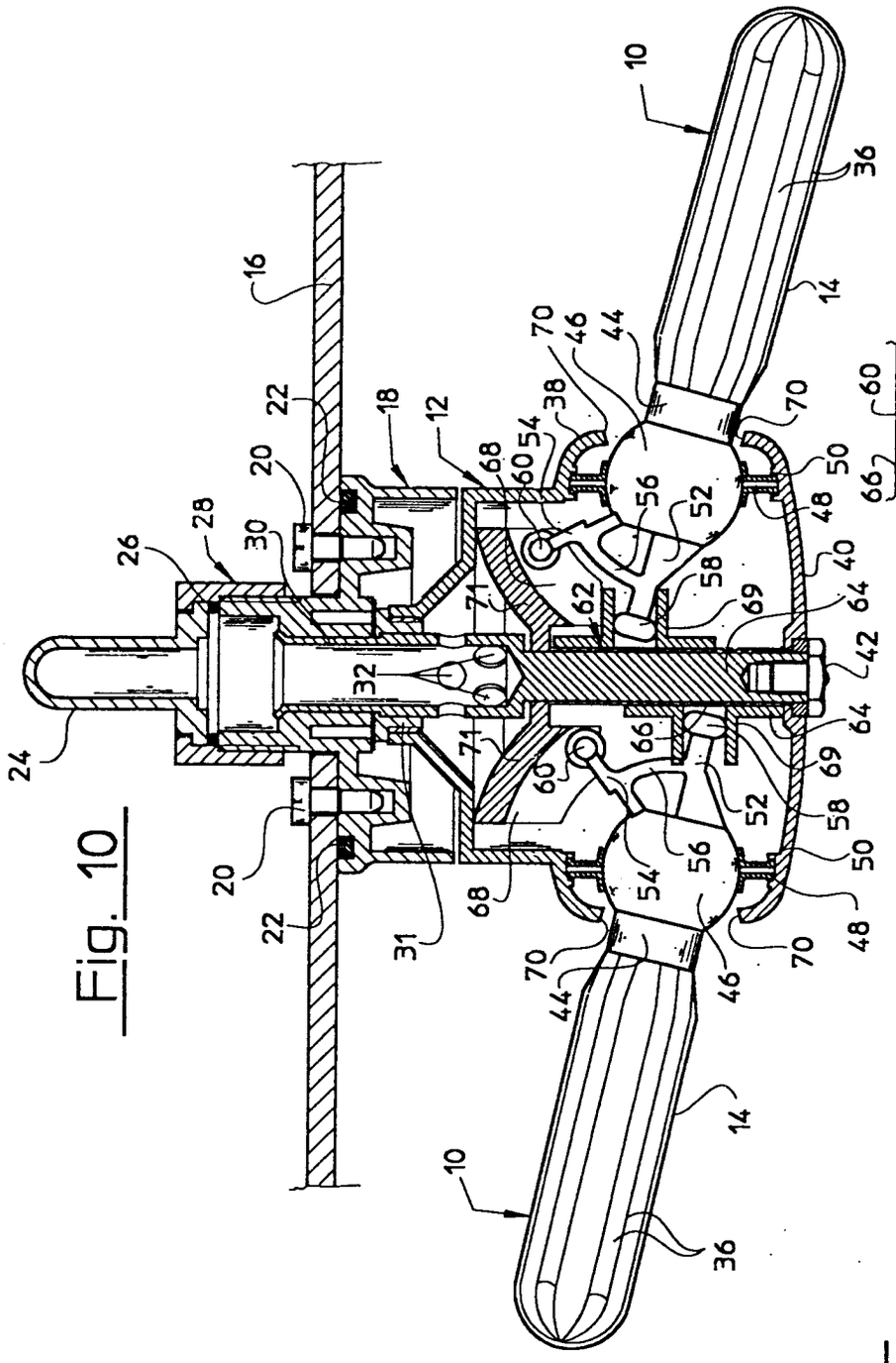

Fig. 10

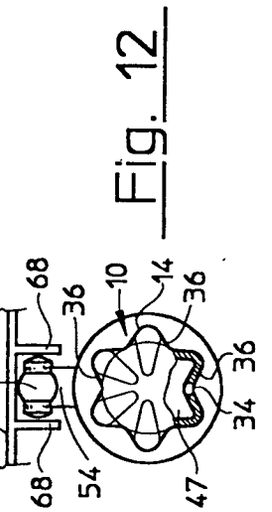

Fig. 12

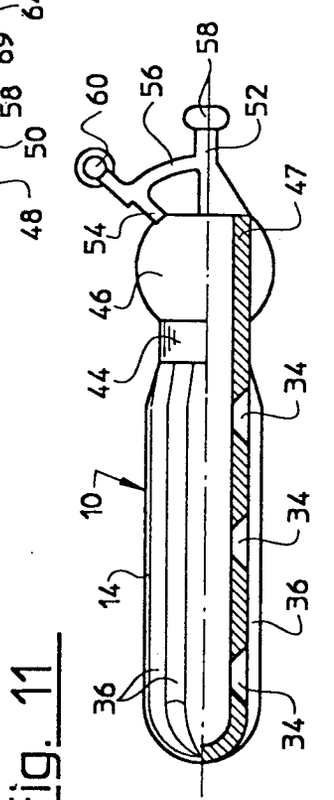

Fig. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 2776

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.6)
A	US 2 619 384 A (JEPSON) 25 November 1952 * column 4, line 55 - column 5, line 13 *	1-8, 10-13	B05B3/06
A	US 2 335 281 A (JEPSON) 30 November 1943 * page 2, left-hand column, line 48 - page 2, right-hand column, line 66 *	1-8,13, 28	
A	GB 1 347 659 A (HOOVER MFG CO LTD) 27 February 1974 * page 1, line 83 - page 2, line 5 *	1-8, 10-12,28	
A	US 5 242 113 A (MANDERSON CHRISTOPHER) 7 September 1993 * abstract *	1	
A	US 3 868 949 A (ARNESON HOWARD M) 4 March 1975 * abstract *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 December 1997	Juguet, J

CATEGORY OF CITED DOCUMENTS

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