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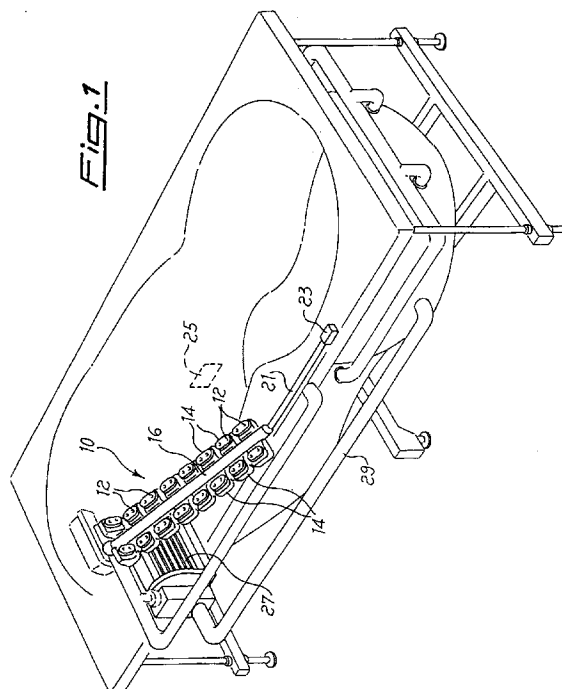
(71) Applicant : **JACUZZI Inc.**
2121 N. California Blvd. Suite 475
Walnut Creek, CA 94596 (US)

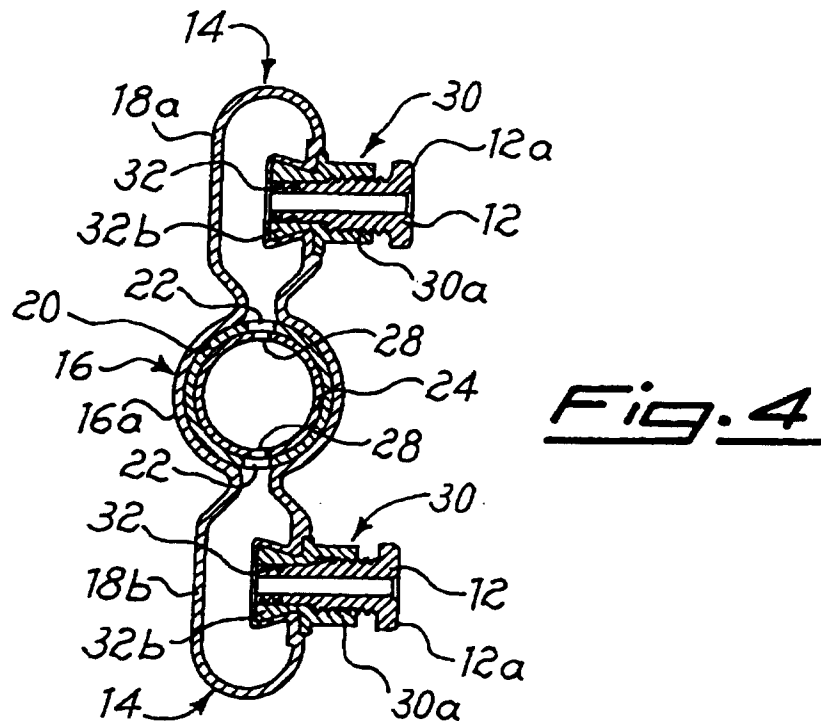
(72) Inventor : **Carmelo, Ianni**
Via Resistencia 49
I-33034 Fagagna (IT)
Inventor : **Furlan, Livio**
Via Molinari 47
I-33170 Pordenone (IT)
Inventor : **Jacuzzi, Roy**
142 Silver Oak Terrace
Orinda CA 94563 (IT)

(74) Representative : **Dragotti, Gianfranco et al**
SAIC BREVETTI s.r.l.
Via Paris Bordone 9
I-31100 Treviso (IT)

(54) **Hydromassage bath with a rotating distributor.**

(57) A bathtub for hydromassage, in particular for hydromassaging the back, is described. The bathtub comprises a series of nozzles 12 for delivering liquid under pressure, aligned longitudinally on the backrest 10 thereof in a substantially median position. Said nozzles 12 have associated with them control means for supplying them in succession with the liquid under pressure in one direction or in the opposite direction. This sequence is repeated cyclically for a predetermined period of time. The control means comprise a distributor which receives the liquid under pressure from a supply source and which is provided with a first substantially stationary member 20,34 and a second member substantially movable 24,52 with respect to the first member. The second member is provided with at least one opening 28,56 designed to be positioned, as a result of displacement of the movable member 24,52, opposite openings of the fixed member 22,44 communicating in succession with the series of nozzles 12. In this way the liquid under pressure is allowed to flow into the latter, supplying of the nozzles 12 being performed in one direction or in the opposite direction according to the direction of displacement of said movable member 24,52.





The present invention relates to bathtubs for hydromassage in general and more particularly to bathtubs provided with means for hydromassaging the back.

Hydromassage of the abovementioned type differs from that carried out on other parts of the body on account of the special way in which it is achieved. In fact, whereas with hydromassage in general all the supply vents or nozzles function simultaneously, in the case of hydromassaging of the back the nozzles in question, which are aligned longitudinally in at least one series along the backrest of the bathtub, must be activated in a predetermined sequence. More precisely, they are supplied in succession in one direction (from the bottom upwards) or in the opposite direction. After the desired sequence has been chosen, it is repeated cyclically for a predetermined period of time, depending on the effects which are to be obtained.

The nozzle activation cycle, as described here, can be explained in that the action of this type of hydromassage reproduces the action of a traditional manual massage performed by Shiatzu masseurs or physiotherapists. It is sufficient to mention just one of the advantages offered by this type of hydromassage, i.e. the significant reduction in cost, to understand the huge success of bathtubs which can be used for this purpose and the consequent research efforts by manufacturers to achieve reliable and competitive technical solutions.

Bathtubs which allow the user to undergo hydromassaging of the back are in fact known and it is also known that generally they are provided with suitable programming means for activating and supplying the vents or nozzles delivering the liquid under pressure, as described above. These programming means, which are for example of the electronic type in the more sophisticated models of bath, control sequential opening and closing of solenoid valves inserted in the supply ducts of the various nozzles.

These tubs, however, while achieving satisfactory results in terms of performance, are delicate and difficult to maintain, precisely on account of the frequently used components which are subject to wear. In fact, these components operate in a damp environment and therefore require frequent maintenance. From an economic point of view, therefore, they are not convenient to use.

Mention should also be made of the frequent interruptions in operation, arising for the same reasons referred to above, which cause the user a considerable amount of inconveniences.

A bathtub for hydromassaging the back which eliminates all the drawbacks of conventional bathtubs has now been devised and constitutes the subject of the present invention.

According to one of the main features of the bathtub according to the present invention the control

means associated with the nozzles for delivering into the bathtub a liquid under pressure comprise a distributor which is provided with a first substantially stationary member and a second member movable with respect to the first member. On the second member a series of openings is provided which are designed to be positioned, as a result of displacement of said movable member, opposite openings of the fixed member communicating in succession with the nozzles. This allows to supply the nozzles sequentially in one direction or in the opposite direction according to the direction of displacement of said movable member.

A bathtub for underwater massage with water jets having a water supplying apparatus composed of stationary and movable members is known from DE-B-1087761. Said apparatus is a rotatable water delivering assembly since its movable member is rotatable within the stationary member. More particularly both said rotatable and stationary members consist of a tubular pipe.

The water under pressure is introduced into the rotatable pipe which is provided with series of holes which are angularly offset in the longitudinal direction and are designed to be positioned, as a result of rotation of said pipe, opposite a corresponding series of holes of the stationary pipe, these holes having a rectilinear pattern.

By this apparatus the sequential supplying with water of the holes of the stationary member in one direction or in the contrary one is not obtainable as in the present invention.

On the contrary, when the internal duct is caused to rotate and the water is introduced in it, all the holes of the stationary duct are simultaneously fed with water which is supplied into the bathtub.

The typical way of carrying out the hydromassaging of the back is not achieved by the abovementioned apparatus of the prior art.

According to another remarkable feature of the bathtub of the present invention, its distributor of water therein is a rotating distributor by which the sequential feeding of the nozzles is achieved.

From EP-A-286304 is known a bath installation using a rotary sequency distributor for supplying in turn with air successive groups of openings distributed in different zones of the bottom and walls of the bathtub.

This apparatus however is able only to inject air into the bathtub in order to agitate the bath water contained therein in a discontinuous manner thus giving only a "ripple" effect on the bather. This effect cannot be identified with that of a hydromassage whose action and functions are completely different from a simple ruffling or agitation of the water.

According to another important feature of the bathtub according to the present invention means are provided at the outlet of said distributor for the auto-

matic discharging of the residual liquid from the latter when hydromassage has been terminated. Said discharging means are activated, i.e. opened, when a sensor of the liquid level detects a minimum level of liquid in the bathtub sending a suitable signal to a valve means inserted in a duct connecting the outlet of the distributor with the bathtub waste outlet.

In FR-A-2398851 a distribution apparatus of water is described the configuration of their feeding ducts being that these latter allow to obtain the discharging of the water from the apparatus when its use is terminated. According to the main feature of this apparatus the discharging of the water is simply obtained by gravity since all the various water feeding ducts are inclined towards the bottom in the direction of a discharging device which is the lowest part of the apparatus.

This way of discharging the water is clearly casual and not reliable since there is not the certainty that the discharging device is completely empty. In fact no sensor of the level of liquid is provided as it is the case of the present invention nor any other similar control means.

The characteristics and advantages of the bathtub according to the present invention will emerge more clearly from the following detailed description of two examples of embodiment thereof, provided with reference to the accompanying figures in which:

Figure 1 is an overall schematic perspective view of the bathtub according to the invention;

Figure 2 is a view in overall longitudinal section of a first embodiment of a rotating distributor which performs hydromassaging of the back;

Figure 3 is a plan view of the distributor according to Figure 2;

Figure 4 is a view of said distributor along the section IV-IV of Figure 3;

Figure 5 is a side view, partially cut-away, of a supply duct of the rotating distributor according to Figure 2;

Figure 6 illustrates a series of cross-sections (from B to I) of the duct according to Figure 5;

Figure 7 is a schematic cross-sectional view of a second embodiment of the rotating distributor which performs hydromassaging of the back;

Figure 8 is a plan view of the distributor according to Figure 7 in a first operating condition;

Figure 8a is a plan view of the distributor according to Figure 7 in a second operating condition;

Figure 9 illustrates schematically application of the rotating distributor according to Figure 2 to the backrest of the bath.

With reference first of all to Figures 1 to 6, a description will now be given, by way of a non-limiting example, of the first embodiment of the bathtub according to the invention.

Only the backrest portion of the tub is shown since it is the only part which is of interest for the pur-

poses of understanding the present invention. The remainder of the bathtub, whilst being provided with other devices for hydromassaging, is not shown since it is known per se.

The backrest, denoted overall by 10, has two series of vents or nozzles 12 for delivering a liquid under pressure, such as water for example.

The nozzles 12 of each of the two series are aligned in a direction substantially parallel to the longitudinal median axis of the backrest 10 and the two series of nozzles 12 are parallel to each other and are composed of an equal number of nozzles 12 which are equidistant with respect to each other.

More precisely the nozzles 12 of each series are mounted in pairs, as described in more detail below, on the upper side, i.e. on the side where the backrest 10 of the bath is located, of chambers 14 formed longitudinally in two parallel and symmetrical rows with respect to a composite central longitudinal duct 16 on two tubular portions denoted overall by 18a and 18b, respectively. As can be noted in particular from the cross-section of the assembly described here, the external wall 16a of the duct 16 and the portions 18a, 18b are formed as one piece.

Advantageously, therefore, this assembly may be made of plastic and hence be obtained simply by means of moulding with a significant reduction in costs.

It can also be appreciated from the longitudinal section described above that, with the same moulding operation, the chambers 14 of each row are separated from each other since, between each pair of nozzles 12, the walls of the tubular portions 18a and 18b are folded back in a U-shape against one other on the three sides which extend from the central duct 16, thereby defining and separating between them the chambers 14 of each row.

The chambers 14 which are located opposite one another symmetrically with respect to the composite central duct 16 may, however, assume two different and separate operating conditions. They may, in fact, be respectively separated from one another or in communication with one another depending on the configuration assumed by the composite central duct 16 which, as will be explained below, performs the important function of a rotating distributor. In the second position, in particular, the chambers 14 in question are supplied simultaneously with liquid under pressure by the composite central duct or rotating distributor 16, supplying in turn the two pairs of nozzles 12 associated with them.

It is obvious that, instead of a pair of nozzles 12 for each chamber 14, only one or more than two of them could be provided, these being variations strictly equivalent to the embodiment illustrated and described herein by way of example.

The composite central duct or rotating distributor 16 comprises, within said external wall 16a, an essen-

tially cylindrical sleeve 20, the ends of which are arranged in a fixed position in suitable seats provided at the ends of the tubular portions 18a, 18b.

The sleeve 20 is open at the ends, into one of which the liquid under pressure coming from a known supply pump 27 connected inside the bath via a duct 29 is introduced.

The sleeve 20, at the other end, is connected to a duct 21 connected in turn to the waste outlet of the tub. The duct 21 has inside it a solenoid valve 23 which is connected to a suitable electronic sensor 25 for detecting the level of the liquid inside the bathtub, indicated by a broken line in the illustration, said sensor being fixed in any known manner on one of the external walls of the tub, for example the rear wall as shown in Figure 1. This sensor 25, known per se, is calibrated so as to emit a control signal for opening the solenoid valve 23 when the level of water inside the tub, during its emptying at the end of the hydromassage, has reached a predetermined minimum value. This value, for example, corresponds substantially to the height at which the lower delivery nozzles 12 are located with respect to the bottom of the bathtub.

The means described above, which allow the rotating distributor to be emptied entirely, prevent stagnation of the liquid in the said distributor, which is particularly damaging if the tub is not used for a long period of time.

At the inlet to the chambers 14, the sleeve 20 is provided with openings 22 (Figure 4) which allow the liquid under pressure to flow inside said chambers. According to one of the particularly advantageous features of the bathtub according to the invention, by means of a suitable supply duct 24 arranged inside the sleeve 20, the liquid under pressure is introduced in succession into each pair of chambers 14 located opposite one another, i.e. in communication with each other as described above, in one direction or in the opposite direction.

The abovementioned supply duct 24, which can be seen more clearly in Figures 5 and 6, formed by a tubular body of a length substantially equal to that of the external sleeve 20 on which there is formed a plurality of holes 28 which are suitably offset with respect to one another and which allow the chambers 14 to be supplied in sequence with liquid under pressure, as explained above.

More precisely, the holes 28 are grouped together, in the example of embodiment considered, in fours on portions 26 of equal length of the duct 24. The four holes 28 of each portion 26 are arranged in pairs in a diametral plane, i.e. are arranged at 180°, while the holes of each portion 26 with respect to the preceding portion are offset at a predefined and constant angle, generally an acute angle. In this way the holes 28 are distributed over the duct 24 substantially in two helices.

In this situation it is obvious that, by rotating the duct 24, the holes 28 will gradually be positioned in succession opposite the openings 22 of the sleeve 20, thus allowing the liquid under pressure to pass correspondingly from a pair of opposite chambers 14 to the next pair, and so on as far as the last pair, thus supplying all the nozzles 12. The order in which these latter are activated depends on the direction of rotation of the duct 24 and, in order to obtain the supply sequence mentioned earlier, it is sufficient to rotate said duct in one direction or the other.

The conditions in which the hydromassage is performed may be varied according to the user's needs and requirements. For example, increasing or reducing the speed of rotation of the duct 24 causes, respectively, a reduction or increase in the duration of the supply sequence of the nozzles 12.

The force of the jets emerging from the nozzles 12 may be varied for example by modifying the delivery of the liquid supply pump and this in particular enables one to increase or decrease the pressure with which the jets of said liquid reach the user's body.

According to a further advantageous feature of the invention, the assembly consisting of the composite central longitudinal duct 16 and the two tubular portions 18a and 18b is fixed to the rear wall of the backrest 10. A description is now given, by way of a non-limiting example, of a possible embodiment of this fixing system. The abovementioned assembly is first of all simply rested on the rear surface of the said backrest 10 of the tub, inside a suitable seat in the latter.

Then the nozzles 12 are applied and fixed, through holes in said backrest 10, to the tubular portions 18a, 18b, thus fixing in this way the entire assembly to the bathtub.

In the example of embodiment considered, as can be seen more clearly in Figures 2 and 4, the walls of the tubular portions 18a, 18b to which the nozzles 12 are applied, are provided with sleeve elements 30 of essentially cylindrical shape, the middle zone of which is sealingly fixed in any known manner to said walls.

The portions 30a of the sleeve elements 30 which project outside the chambers 14 are threaded internally so that a corresponding threaded portion of the body of the nozzles 12 allows the latter to be screwed inside them. The top end of the body of the nozzles 12, i.e. the end arranged inside the tub, has an annular projection 12a which engages with the inner side of the backrest 10, thereby providing the abovementioned fixing system since the end of the portions 30a of the sleeves 30 engages with the external surface of the backrest 10.

On the end of the body of the nozzles 12 opposite to the preceding end there are formed annular grooves, two in the example considered, inside each of which a seal 32 is mounted, said seal being provided

ed so as to ensure a sealing action when the above-mentioned end of the nozzles 12 is inserted into the portion 30b of the sleeve elements 30 which is located inside the chambers 14. The reason why two, or in some cases more than two, seals 32 are provided is in order to ensure the sealing action in all circumstances, namely engagement of at least one seal 32 in said portion 30b of the sleeves 30, independently of the wall thickness of the backrest 10, which may vary from one bathtub to another.

It should obviously be remembered that the provision of holes 28 on the duct 24 must be regarded solely as an example of embodiment since the same effects could be obtained by providing said duct with longitudinal eyelets, each of which would replace a pair of holes 28, while, as regards the rest, these eyelets would be arranged, from one portion 26 to the next, offset in the same manner as the holes in question.

With particular reference now to Figures 7 to 8a, a variation of embodiment of the bathtub according to the invention shall be described.

In the case of this bath also, only the backrest is shown for the same reasons indicated above and this backrest is again denoted by 10.

The variation of embodiment which is described in detail below also makes use of a rotating distributor, thereby offering the same advantages as the first embodiment.

The rotating distributor is composed of a stator 34 consisting of a hollow cylindrical body 36 supported in any manner known per se by a fixed frame (not shown).

The stator 34 is provided at the bottom with an inlet duct 38 for the liquid under pressure, which is connected via a pipe 40 to a supply pump 42 which draws the liquid for example directly from the bathtub.

On the top end of the stator 34 there is provided a series of holes 44 through which the liquid under pressure supplied by the pump 42 is able to flow out. Each of the holes 44 is provided with a tube-piece 46 to which there is sealingly connected in any known manner the end of a duct (not shown) on the other end of which there is mounted a pair of vents or nozzles for delivering the liquid under pressure (also not shown). In this case also, in fact, the bathtub according to the invention has two series of delivery nozzles for hydromassaging of the back, which are arranged in two mutually parallel lines which extend longitudinally and in a median position along the backrest 10 of the tub.

The stator 34 has arranged inside it a rotor 52 which consists of an essentially disc-shaped body 54 with a shaft 55 which extends towards the bottom of the cylindrical body 36, emerging from its bottom end so as to be connected, in any known manner (not shown), to drive means which cause rotation thereof and hence rotation of the disc-shaped body 54. This

latter is provided at its periphery, in a zone located opposite the holes 44 of the stator 34, with an eyelet 56 with an essentially circular profile. In this way, when the disc-shaped body 54 is made to rotate, the eyelet 56 positions itself in succession opposite the holes 44 of the stator 34, thereby allowing the liquid under pressure coming from the bottom of the cylindrical body 36 to flow towards them.

According to a particularly advantageous feature of the rotating distributor in question, as can be seen in particular from Figures 8 and 8a, the eyelet 56 extends over an arc of a circle of a length such that, during rotation of the disc-shaped body 54, it gradually assumes in succession two operating positions. In the first of these positions (Figure 8) it overlaps with only one of the holes 44, thereby enabling the supply of only one pair of nozzles 50. In the second position (Figure 8a) it overlaps simultaneously and partially with two successive holes 44. In this way it allows two pairs of adjacent nozzles to be partially and simultaneously supplied. In other words, for a predetermined period of time, before a pair of nozzles 50 stops delivering liquid under pressure, delivery by the next pair has already started. This is particularly advantageous since the overall effect of the pressure on the back of the user is substantially continuous, resulting in an action reproducing very closely the effect of the hands of a physiotherapist when performing a back massage.

It is obvious, however, that this preferred embodiment of the eyelet 56 must be regarded as an example which is in no way limiting since, instead of this element, it is possible to provide simply a hole with a diameter substantially equal to the diameter of the holes 44, without the characteristics and operating features of the distributor being negatively modified. In this case, unlike the preceding case, the various pairs of nozzles 50 will be activated one at a time in succession.

The activation sequence of all the pairs of nozzles in one direction or in the opposite direction depends, as with the first embodiment, on the direction of rotation of the rotor 52.

Similarly the value of the speed of rotation of the rotor 52 determines the duration of the abovementioned sequence.

Again, in a similar manner, the value of the pressure of the hydromassage is dependent upon the delivery of the supply pump 42.

The above description clearly illustrates the advantages of the bathtub according to the present invention.

By providing the rotating distributor for carrying out the hydromassage of the back, the tub is simplified and the cost thereof reduced. In fact, the abovementioned distributor has made it possible to eliminate, or at least has entirely replaced, all the complex programming means provided in conventional bath-

tubs.

The need for maintenance and the interruptions in operation have therefore been reduced to a minimum, if not eliminated, thereby making the bath particularly reliable.

It is obvious, finally, that conceptually and structurally equivalent changes and/or modifications may be made to the bathtub according to the present invention without thereby departing from the scope thereof.

Claims

1. Bathtub for hydromassage, in particular for hydromassaging the back, of the type comprising at least one series of nozzles for delivering a liquid under pressure, aligned longitudinally on the backrest of the bathtub in a substantially median position, said nozzles having associated with them control means for supplying them in succession with said liquid under pressure in one direction or in the opposite direction, the prechosen supply sequence being repeated cyclically for a predetermined period of time, said control means comprising a distributor which receives said liquid under pressure from a supply source and which is provided with a first substantially stationary member and a second member movable with respect to the first member, there being provided on said second member at least one opening designed to be positioned, as a result of displacement of said movable member, opposite openings of the fixed member, said distributor being a rotating distributor in which said second movable member is rotatable with respect to the first stationary member, characterized in that the openings 22 of the fixed member 20 communicate in succession with the nozzles 12 of said series so as to allow said liquid under pressure to flow into the latter, supplying of the nozzles 12 being thus effected in one direction or in the opposite direction according to the direction of rotation of said movable member 24.
2. Bathtub according to Claim 1, characterized in that said rotatable member 24 comprises two series of openings 28 in which the openings of one series are equally offset in the same manner as those of the other series, the openings 28 of one series being arranged at 180° with respect to those of the other series such that each pair of openings located at 180° in the same diametral plane positions itself opposite the inlet of chambers 14 arranged at 180° in series laterally with respect to said member 24, each of which has mounted on it at least one nozzle 12 for delivering the liquid under pressure.

3. Bathtub according to Claim 2, characterized in that the said chambers 14 of each series are not in communication with each other, while the chambers 14 located opposite each other at 180° are in communication with each other.
4. Bathtub according to Claim 2, characterized in that each of said chambers 14 is provided, on the side on which said nozzle 12 for delivery of the liquid under pressure is mounted, with a sleeve element 30 communicating with the inside of said chamber 14 on which said delivery nozzle 12 is fixed.
5. Bathtub according to Claim 4, characterized in that each of said sleeve elements 30 has a first and a second portion 30a, 30b, respectively outside and inside the chamber 14 with which it is associated, the external portion 30a having fixed to it a part of the body of said delivery nozzle 12, the end of which, provided with sealing means 32, is inserted into the internal portion 30b of said sleeve element 30.
6. Bathtub according to Claim 2, characterized in that the chambers 14 of each series are formed as one piece consisting of an essentially tubular portion 18a, 18b, the said tubular portions 18a, 18b being connected together by two essentially semi-cylindrical walls 16a inside which said tubular member 24 is rotatably accommodated.
7. Bathtub according to Claim 6, characterized in that, between said semi-cylindrical walls 16a and said tubular member 24, there is arranged a stationary sleeve 20 open at one end and provided with an opening 22 at the inlet of each of said chambers 14.
8. Bathtub according to Claim 6, characterized in that the assembly consisting of said tubular portions 18a, 18b and said semi-cylindrical walls 16a is mounted and fixed externally and at the rear of the backrest 10 of the bath so that the end of the nozzles 12 projecting from the external surface of the bath and said assembly are fixed together.
9. Bathtub according to Claim 8, characterized in that, when the delivery nozzles 12 are fixed to the sleeve elements 30, the end of said external portion 30a of the sleeves engages with the external surface of the backrest 10 of the bath and, simultaneously, an annular projection 12a of the end of the delivery nozzles 12 engages with the internal surface of said backrest 10.
10. Bathtub according to Claim 9, characterized in that fixing of the delivery nozzles 12 to said ex-

ternal portion 30a of the sleeve elements 30 is performed by means of screwing.

11. Bathtub according to Claim 5, characterized in that on the end of the nozzles 12 which is introduced into said internal portion 30b of the sleeve elements 30, there are mounted several seals 32 arranged at a suitable distance from each other so that at least one of them is introduced into said internal portion 30b so as to ensure sealing independently of the thickness of the wall of the bath's backrest 10. 5
12. Bathtub according to Claim 1, characterized in that said rotating member consists of a substantially flat rotor 52 provided with an opening 56 designed to be positioned in sequence, as a result of rotation of said rotor, opposite said openings 44 of the fixed member. 10 15
13. Bathtub according to Claim 12, characterized in that said rotor 52 is an essentially disc-shaped body 54 arranged inside an essentially cylindrical and hollow stator 34 in the vicinity of one of its ends provided with a plurality of openings 44 equally spaced circumferentially, each of which is connected, via a supply duct 46, to at least one nozzle 12 for delivering the liquid under pressure. 20 25
14. Bathtub according to Claim 13, characterized in that said hollow cylindrical body 34 receives the liquid under pressure substantially at the end opposite to that where said disc-shaped body 54 is located. 30 35
15. Bathtub according to Claim 12, characterized in that said opening 44 of the disc-shaped body 54 is essentially in the shape of an eyelet 56 with an essentially circular profile. 40
16. Bathtub according to Claim 15, characterized in that said eyelet 56 extends over an arc of a circle of a length such that, during rotation of said disc-shaped body 54, it gradually assumes in succession two operating positions, in the first of which it overlaps with only one opening 44 in the end of said stator, thereby allowing supplying of only one of said at least one nozzle 12, while in the second position it overlaps simultaneously and partially with two of said at least one successive nozzle(s) 12, thereby allowing them to be partially and simultaneously supplied. 45 50
17. Bathtub according to Claim 12, characterized in that said opening 56 of the disc-shaped body 54 has a cross-section substantially equal to that of the openings 44 in the stator 34. 55

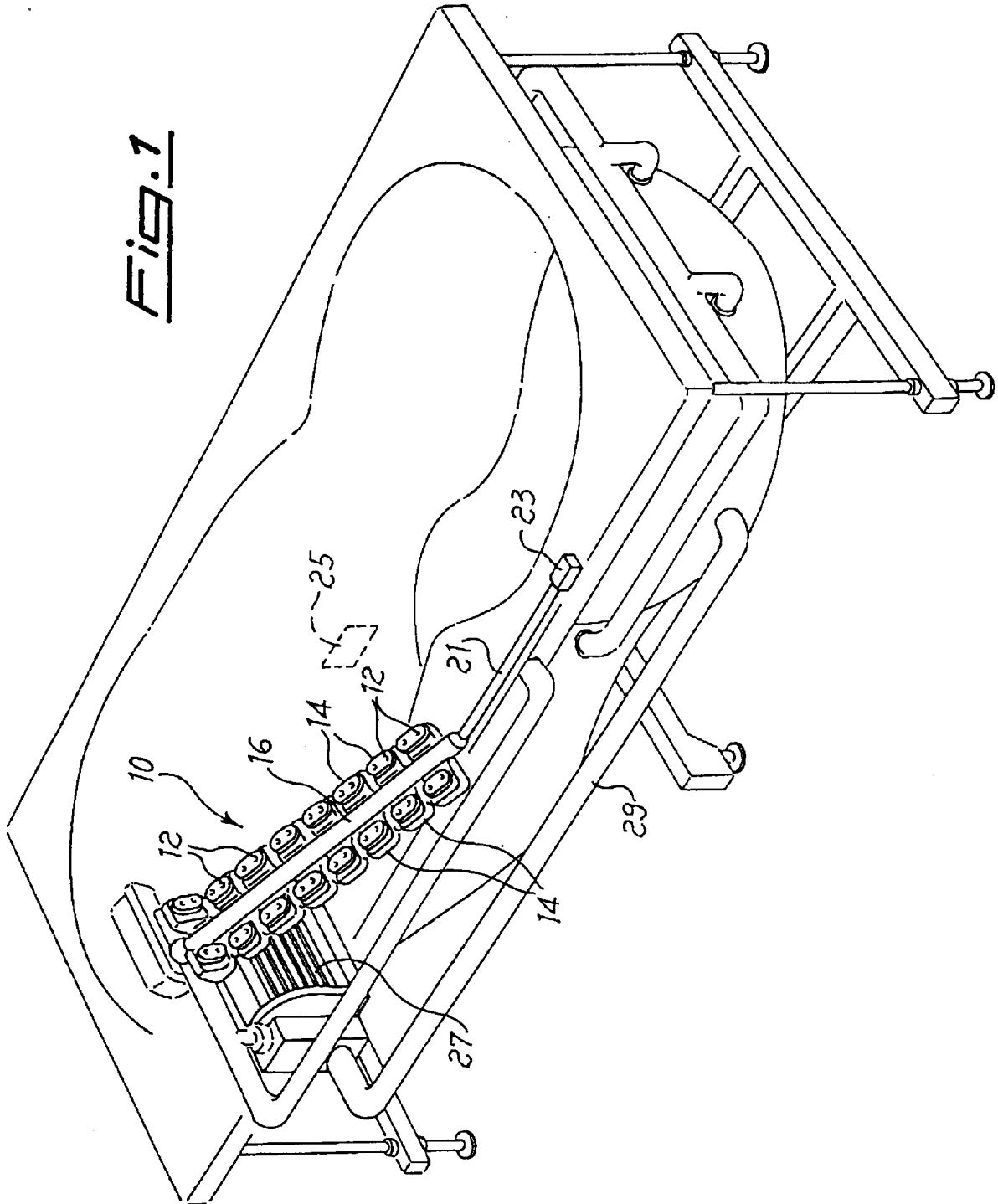
18. Bathtub according to Claim 1, characterized in that the value of the speed of rotation of said rotatable member 24,52 determines the duration of the sequence for supplying of the delivery nozzles 12.

19. Bathtub according to Claim 1, characterized in that it further comprises, at the outlet of said distributor, means for automatic discharging of the residual liquid from the latter when hydromassage has been completed.

20. Bathtub according to Claim 19, characterized in that said means for automatically discharging the residual liquid from the distributor comprise valve means 23 inserted in a duct 21 connected to the bath waste outlet, said means being designed to be activated by sensor means 25 for detecting the liquid in the bath when the latter has reached a predetermined minimum level during emptying of the said bath.

21. Bathtub according to Claim 20, characterized in that said predetermined minimum level corresponds essentially to the height at which the lower delivery nozzles 12 are arranged with respect to the bottom of the bath.

Fig. 1



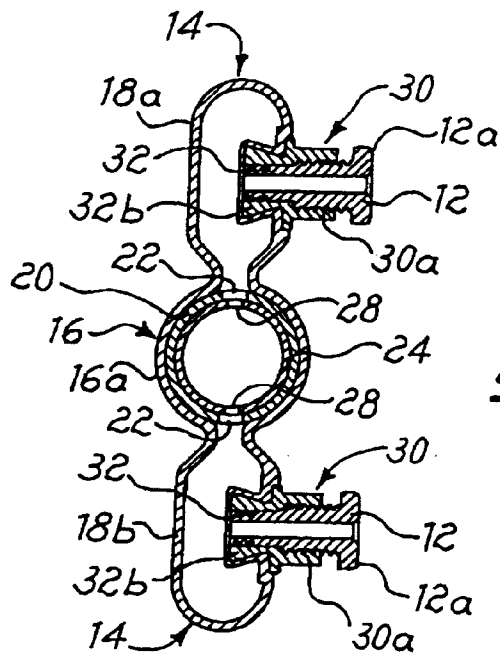
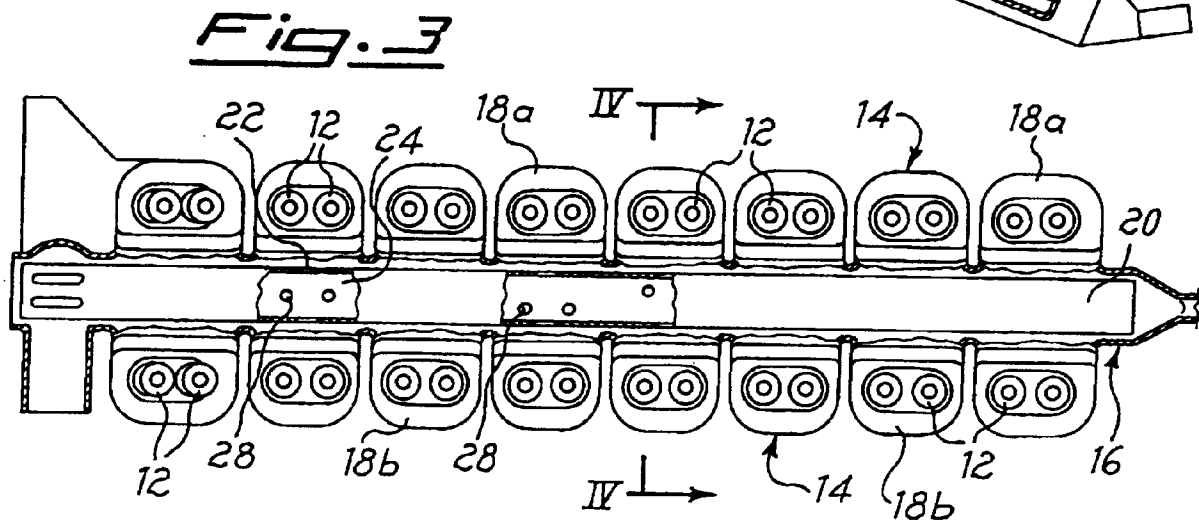
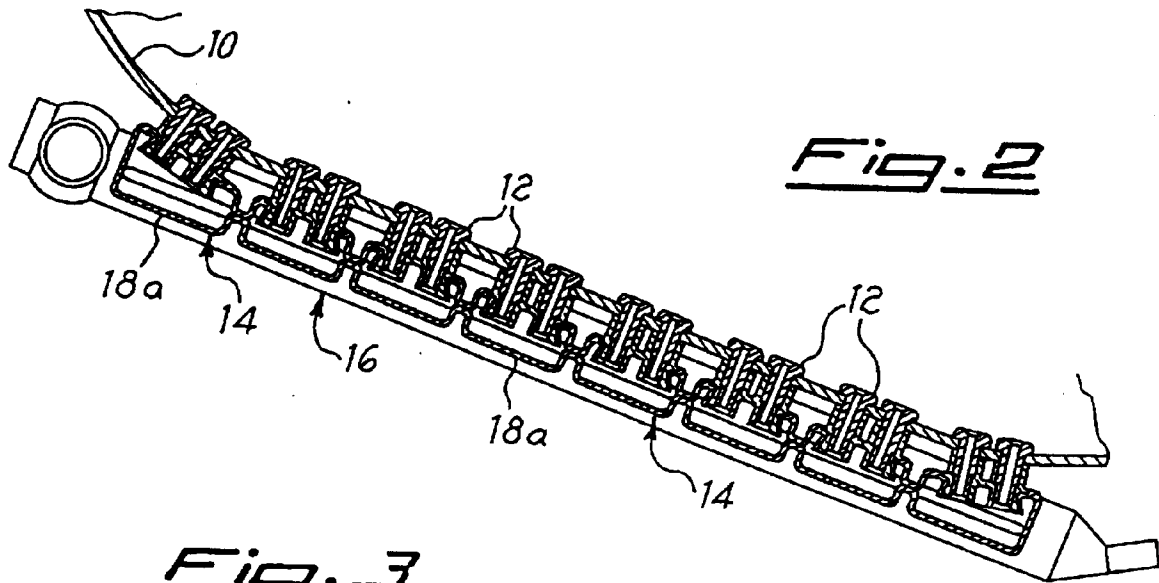


Fig. 5

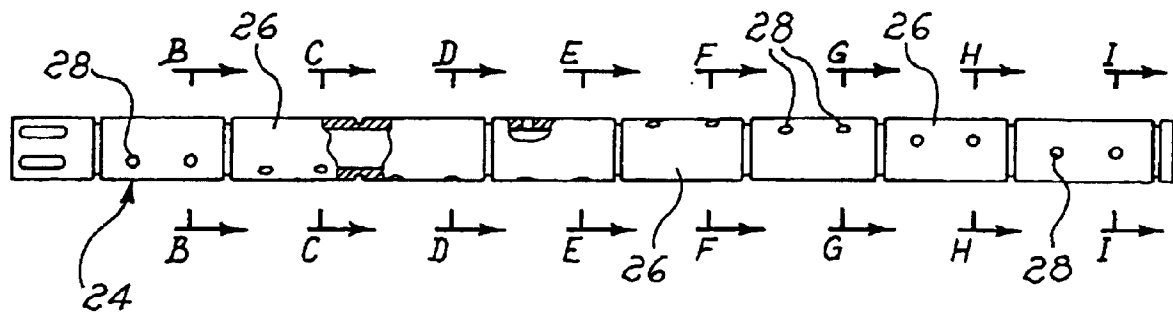


Fig. 6

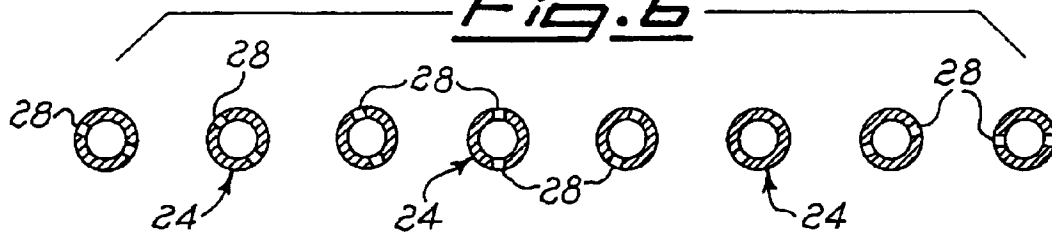


Fig. 7

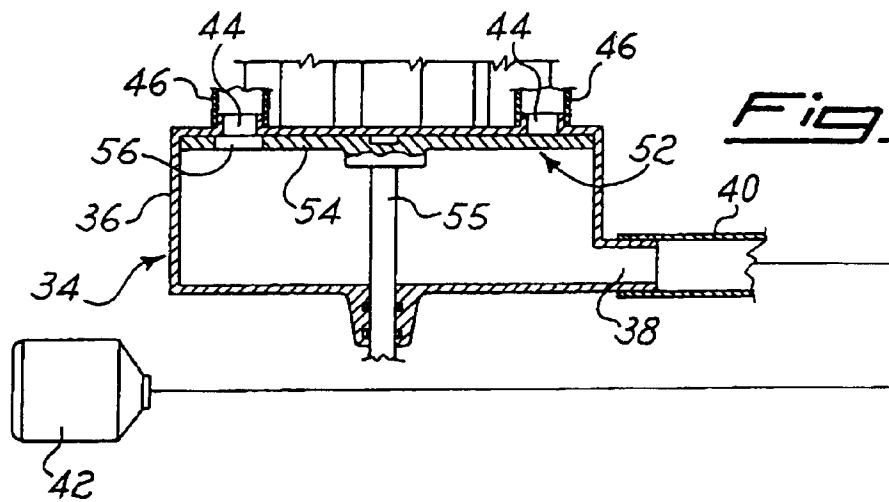
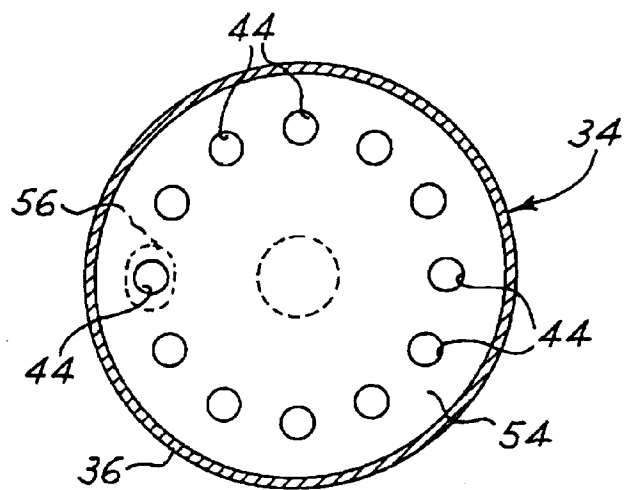
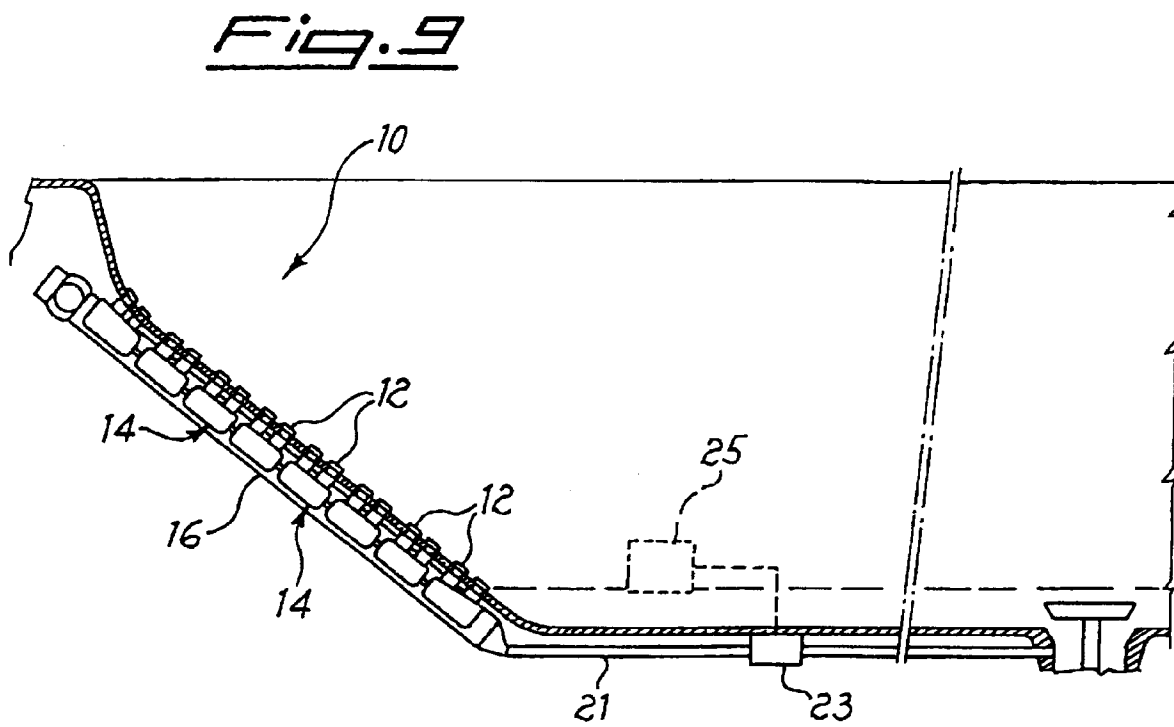
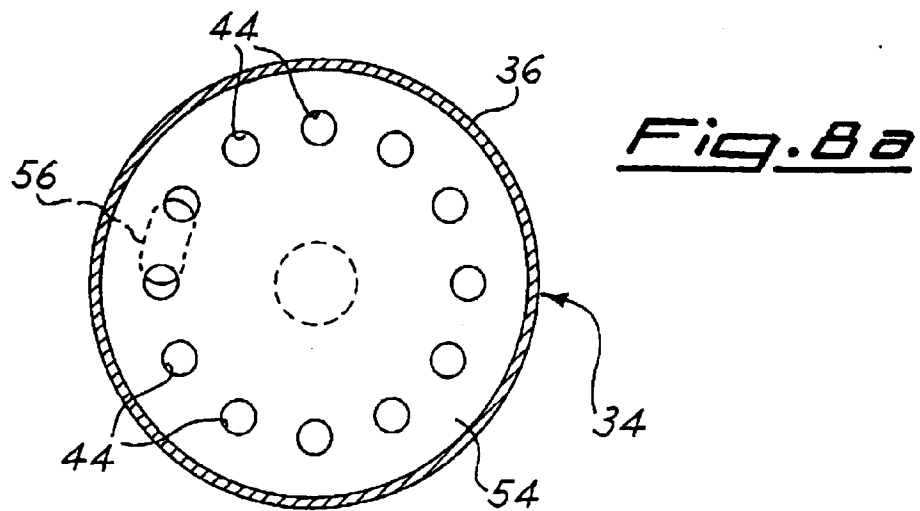


Fig. 8







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 2732

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)
X	EP-A-0 286 304 (LEIGH STEWART PRODUCTS LIMITED)	1,12-18	A61H33/00
Y	* column 2, line 55 - column 3, line 23 * * column 4, line 2 - line 8; figures 1-3 * * column 1, line 19 - line 22 *	19	
Y	FR-A-2 398 851 (NICOLLET) * page 1, column 30 - column 35; claims 1,2; figures *	19	
A	DE-B-10 87 761 (HOFFMAN) * column 2, line 50 - column 3, line 26; figures *	5	
A	FR-A-2 610 519 (GEDOUIN) * page 2, line 31 - page 3, line 2 * * page 1, line 14 - line 20; figure 2 *	1	
A	EP-A-0 154 935 (CONTI) * page 6, line 2 - line 23; figures 1,2 *	1	
A	FR-A-2 364 026 (DUCLAUX) * page 2, line 26 - page 3, line 22; figure *	1,18	TECHNICAL FIELDS SEARCHED (Int.Cl.6) A61H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13 December 1994	Examiner JONES, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	

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