(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 270 084 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.01.2003 Bulletin 2003/01

(51) Int Cl.[7]: **B05B 9/08**

(21) Application number: **01115167.7**

(22) Date of filing: **22.06.2001**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
AL LT LV MK RO SI

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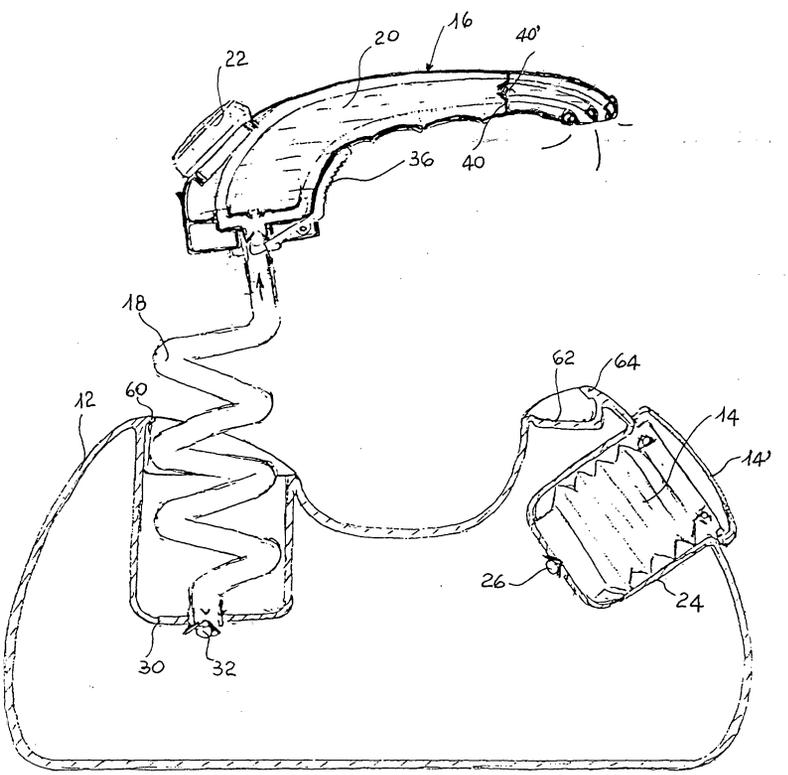
(54) Portable mist cooling device

(57) A portable refreshing device (10) of any shape and size, made from plastic material or other suitable materials, comprises a reservoir (12) with slightly pressurized air connected through a tube (18) to a handle or grip (16) integrating a cavity (20) containing a liquid coming from the front part of said grip through a nozzle (70), and at least a pipe (42') for feeding the air contained in said reservoir that comes out close to the liquid carried by nozzle (70); the reservoir (12) incorporates a hand-activated pump (14), located in a cavity (24) of said reservoir, with a hole provided with an unidirectional valve (26).

Fig. 3.



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Description

[0001] The present invention relates a portable refreshing device.

[0002] More particularly, the present invention relates to a device suitable to develop, through a manual operation, a flow of humid fluid micro-particles to be sprayed on the skin or parts of users' body. Said fluid is constituted entirely or partly by water taken from any point of water networks, or made available by conventional containers such as bottles or the like.

[0003] As is known, especially in the presence of particular weather conditions, connected to situation of possible relax, one feels the need of having at hand products or an equipment that can provide refreshment, at least temporarily. Such situations takes place, for instance, in times of heat, wherever people happen to be; generally, these are circumstances when the need of seeking relief clashes with the conditions imposed by the environment that does not allow to obtain a quick and easy comfort, or that, while allowing it in principle, obliges on the other hand the user to move, stopping or substantially altering the relax time.

[0004] Typically, in order to obtain a benefit from this aspect, refreshing paper napkins are used or, if the condition so allows, conventional atomizers of the type generally used to spray detergents along the surfaces to be cleaned. In the first case, this solution is sometime counter-productive, as said napkins are impregnated with substances whose refreshing effect is a minimum one, maybe immediate but that dissipates very soon; in the second case, the conventional atomizers may actually bring relief, but have the non-negligible drawback of spraying high amounts of liquid, which can give rise to the formation of many drops and trickles on the body part concerned by the treatment. Such a situation can be tolerated only in some conditions, when the subject is in a state of substantial privacy; in other cases, apart from the necessity of drying, at least partially, after the spraying the wet body parts, with regard, at least to the eyes, such atomization can create an overall uncomfortable sensation, being excessive with respect to the requirement of liquid supply.

[0005] There are also known, for instance from patents US nos. 5,000,384, 5,322,342 and WO 99/62328, fixed apparatuses substantially intended for the same purposes; however, these apparatuses are complex from the constructive point of view, require a specific application to bearing structures, for instance couches or beach deck-chairs or are constituted by fixed location systems that oblige users to move to reach and utilize them.

[0006] Other solutions require also that the liquid-containing reservoir be pressurized, with the ensuing necessity of interventions of qualified operators or the same users who must stand up from the couch, interrupting relax. The pressurization of the reservoir further complicates the construction of the apparatuses, taking into account the fact that they are utilized only in the sun or at least in regions where ambient temperature is high, they require the adoption of specific, not minor contrivances, in order to structure the reservoir in such a way as not to create overpressure problems. As a consequence, said apparatuses are bulky and expensive.

[0007] Object of the present invention is to obviate the above drawbacks.

[0008] More particularly, object of the present invention is to realize a portable refreshing device allowing, at any time and on any condition, to be so activated as to wet body parts with minimum and calibrated amounts of liquid, causing an effective refrigerating action.

[0009] A further object of the invention is to realize a refreshing device whose activation creates a micro-mist, as the liquid is mixed with air in correspondence of the outlet nozzle.

[0010] A not least object of the invention is to realize a refreshing device that, being portable, does not require the setting up of specific supports and can be activated by users in a quick and easy manner in any place.

[0011] Another object of the invention is to realize a refreshing device allowing to utilize as a reservoir also flexible and pliable containers, that are therefore easily transportable in a hand-bag, a prior pressurization of the liquid being not required.

[0012] A further object of the invention is to provide users with a refreshing device able to ensure a high level of resistance and reliability in the time, and also such as to be easily and economically realizable.

[0013] These and still other objects are achieved by the portable refreshing device of the present invention which may have any shape and size and be obtained from plastic material or other suitable materials, basically characterized in that it comprises a reservoir with slightly pressurized air connected through a tube to a handle or a grip integrating a cavity containing a liquid coming from the front part of said grip through a nozzle, and at least a pipe for the supply of the air contained in said reservoir which air comes out close to the liquid brought by the nozzle, said reservoir incorporating a hand-activated pump, located in a cavity of said reservoir, with a hole provided with a unidirectional valve.

[0014] The constructive and functional characteristics of the portable refreshing device of the present invention will be better understood thanks to the following description, wherein reference is made to the attached drawings which represent a preferred, non limiting invention, and wherein:

Figure 1 shows schematically, in side view, the portable refreshing device of the present invention in non-operating condition;

Figure 2 shows a functional scheme of the same device;

Figure 3 shows schematically, in side view, the same device in operating condition;

Figure 4 shows schematically, in detail, the handle of the same device.

[0015] With reference to the above figures, the portable refreshing device of the present invention, indicated as a whole by 10 in Figure 1, comprises a containing unit or reservoir 12, of any shape and size, a small pump 14, for instance of the bellows-type, integrated in said reservoir, and a handle or grip 16 connected through a tube 18 to said reservoir and incorporating a plurality a ducts that flow at the front end in as many supplying nozzles, which will be described later on.

[0016] In the inside of grip 16 a cavity 20 is formed that communicates with the outside through a hole closed by a plug 22. Reservoir 12, made, for instance, from rigid plastic or plasticized fabric, is intended for containing ambient air which is slightly compressed by a manual action exercised on pump 14 of a substantially known type. In the preferred embodiment of the figures, reservoir 12 has a first recess or shaped seat 24 having a shape entirely complementary to that of the pump 14 that abuts in the same and is stabilized with known means, for instance, adhesives, the upper front of pump 14 is defined by the conventional elastic membrane, indicated by 14', which is hand-compressed in order to pressurize the air in reservoir 12; by way of orientation, the pressures realized in said reservoir is comprised between 0.2 and 1.5 bar.

[0017] At the base of the shaped seat 24 an unidirectional valve 26 is located that prevents air from downflowing from reservoir 12. Preferably on the latter a second recess or shaped seat 30 is formed, whose mouth is oriented towards the upper part of said reservoir; said second shaped seat 30, having by way of example a circular plan, constitutes the housing seat of tube 18, advantageously of the coiled type, that causes reservoir 12 to get in touch with handle or grip 16.

[0018] A nonreturn valve 32 is preferably located in correspondence of the end of tube 18, directed to reservoir 12; tube 18 is respectively fastened to the base of the second recess 30 and grip 16 by means of conventional quick attachments or like means.

[0019] Said grip, advantageously made from plastic material, has in the preferred embodiment a "spout" conformation, made up by two complementary and specular half-shells connected with one another by heat welding, ultrasound welding or like systems. The base of grip 16, i.e. the part that connects with tube 18, has an integral tang 34 for the clutch of said tube; in axial alignment with tang 34, a cylindrical seat 44 is formed that develops in the grip and houses an unidirectional valve 46 elastically tensioned by a helical spring 48. Said valve 46 is so shaped as to be localizable along a seat 46', preferably conical, that forms a choke 50 in seat 44. The upper part of the latter opposed to tang 34, is provided with at least a through-opening 50', radially developed, that causes said seat to get in communication with cavity 20 of grip 16.

[0020] Opening(s) 50' is obtained over seat 46' of valve 46. Choke 50, in its lower part facing tube 18, is preferably conified in the same way as seat 46' and forms a mouth interceptable by the shaped end 52 of an operating lever 36, hand-actionable and having its fulcrum on the body of grip 16. Lever 36 comes out from the latter through an opening 52', circumscribed by a gasket 53 of the O-ring type or the like. Cavity 20 of grip 16 is suitable to receive the liquid, typically water, let in starting from the mouth shielded by plug 22; by way of indication, said cavity is so sized as to contain an amount of liquid comprised between 0.10 and 0.30 liters.

[0021] From seat 44, and in particular the zone that defines choke 50, a duct 42 comes out, integral with grip 16, which branches into at least two tubes 42', developed in a mutually opposed direction throughout the extension of grip 16, in the inside thereof. Tubes 42', opposed to each other, end at the front end of said grip and in such position they bear a conventional supply nozzle whose flow is adjustable and preferably orientable. In the same front part of grip 16, there if formed, preferably by molding, a holed diaphragm 40, possibly shielded by a unidirectional valve 40', which intercepts or open the passage of the liquid present in cavity 20. Downstream of said diaphragm 40, grip 16 has an additional supply nozzle, indicated by 70, which is advantageously located in an intermediate position with respect to the other two nozzles located at the front end of tubes 42' at the outlet from grip 16.

[0022] The mouth of the second shaped seat 30 is provided with a projection or serration 60, to hook to reservoir 12 the rear part of grip 16, which in the opposite front part is housed along a flat zone 62 created on the same reservoir, extended in an extension 64 which constitutes the fitting-insertion seat of said front part of said grip.

[0023] The latter, housed in said seats, advantageously constitutes also the gripping means to transport the device as a whole, reservoir included, when it is not utilized.

[0024] During the utilization, having detached grip 16 from reservoir 12, tube 18 can come out extending into the second cavity 30 and therefore said grip 16 can be oriented in the space to be led close to the body part to be refreshed. Assuming logically that cavity 20 is filled entirely or partly with water, previously let in through the hole closed by plug 22, the only operation to be made by the user is the activation with some impulses of membrane 14' of pump 14, to create in the inside of reservoir 12, which contains only water, a pressure slightly higher than the ambient or environment one. After such intervention, the device object of the invention can operate by acting on lever 36. This handling causes the downwards shifting of the shaped end 52 of lever 36, and the pressurized air present in reservoir 12 can therefore flow into seat 44, into choke 50, and from here into the fluid-containing cavity 20. At the same time, air distributes in

duct 42 and the connected tubes 42'. The passage of air into seat 44, and from it into cavity 20 through the radial holes 50', is preceded by the lifting of valve 46, which is realized following the thrust exercised by said air, arriving from reservoir 12 through tube 18; spring 48 associated to said valve is so calibrated as to compress, causing the possibility of communication through holes 50', depending on the pressure air reaches in reservoir 12. From the front end of tubes 42' there flows only air at the outside of grip 16, with a jet advantageously oriented in the direction of nozzle 70; on the contrary, from the latter, the liquid present in cavity 20, also pressurized by the air that comes partly from holes 50', comes out at a very reduced rate and continuously. The combined effect of air-water, that mixes coming out from the front end of grip 16, causes the formation of a micro-mist or humidified air flow, which touches the body parts on which the user orients said grip. In particular the drop or drops coming out from nozzle 70, pushed by a part of the air flow coming from reservoir 12, are invested by the air coming from tubes 42' suitably oriented between each other in substantially opposed directions. The body zone of the user concerned by the treatment is therefore touched by a modest flow of humidity-saturated air, as the drop or drops coming out from nozzle 70 are parceled.

[0025] The ensuing refreshing effect is, from the one hand, effective, but does not cause, on the other hand, the distribution of excessive amounts of liquid on the skin. The device can work continuously provided there is an even minimum amount of liquid in cavity 20, as the user has the possibility of activating repeatedly or at intervals with one hand membrane 14' of pump 14 and with the other hand lever 36, connected to grip 16.

[0026] As a whole, the device of the present invention allows to obtain an immediate refreshing effect along body zones, and, given its structural configuration, it can be easily utilized in many situations, not necessarily referred to those of typical relax in open and sunny, or in any case hot, spaces. Such a device, in fact, may be easily transported and used, if needed, in other environments, for instance in cars or campers during travels, without the need of unavoidable stops. The only requirement is the availability of a minimum amount of liquid, typically water, in cavity 20 of grip 16.

[0027] Reservoir 12, according to a possible embodiment mentioned above, may be obtained from a flexible material, which further reduces the overall size, moreover already limited, while the global weight of said device, that does not require high amounts of liquid to be let in the reservoir, is negligible.

[0028] The invention, as described above and claimed hereafter, has been proposed only by way of non limiting example, meaning that the same may be subjected to numerous changes and variants, all of which fall however within the scope of the invention concept.

[0029] For instance, the supply ducts of exiting air, which invests the drop or drops of liquid to create the micro-mist, may be present in a higher number or have a location different from what has been described and illustrate by way of example; alternatively, thanks to the central duct from which the drop or drops of liquid exit, one only external annular duct for air inlet may be provided, with a suitable configuration of the outlet mouth to orient and concentrate the air flow in the direction of the nozzle from which the liquid comes out.

Claims

1. A portable refreshing device (10) of any shape and size, made from plastic material or other suitable materials, comprises a reservoir (12) with slightly pressurized air connected through a tube (18) to a handle or grip (16) integrating a cavity (20) containing a liquid coming from the front part of said grip through a nozzle (70), and at least a pipe (42') for feeding the air contained in said reservoir that comes out close to the liquid carried by nozzle (70); the reservoir (12) incorporates a hand-activated pump (14), located in a cavity (24) of said reservoir, provided with a unidirectional valve (26).

2. The refreshing device according to claim 1, **characterized in that** the base of grip (16) shows an integral (34) tang for the fitting of said tube (18), and an aligned cylindrical seat (44) which develops in said grip and houses an unidirectional valve (46) tensioned by a helical spring (48), said valve being located in correspondence of a conical seat (46') forming a choke (50) in the cylindrical seat (44).

3. The refreshing device according to any of the preceding claims, **characterized in that** in the upper part opposed to tang (34) of said seat (44) there is formed at least a through-opening (50') communicating with cavity (20) of grip (16), said at least one opening (50') being realized above the conical seat (46') of valve (46).

4. The refreshing device according to any of the preceding claims, **characterized in that** said choke (50) is conified in its lower part facing tube (18) and forms a mouth that can be intercepted by a shaped end (52) of a hand-operated lever (36) having its fulcrum on grip (16).

5. The refreshing device according to any of the preceding claims, **characterized in that** from the cylindrical seat (44) a duct (42) comes out from which said at least one tube (42') develops.

6. The refreshing device according to any of the preceding claims, **characterized in that** from duct (42) two opposite tubes (42') branch off, obtained inte-

grally with grip (16) and ending at the front end of the same, where they are provided with an adjustable and/or orientable nozzle.

7. The refreshing device according to any of the preceding claims, **characterized in that** in the front part of grip (16), within cavity (20) and upstream of the nozzles of tubes (42') a diaphragm is obtained (40) that integrates a unidirectional valve (40').

8. A dispensing device according to any of the preceding claims, **characterized in that** in the extreme front part of grip (16), in an intermediate position with respect to the nozzles borne by tubes (42') a further nozzle (70) is located suitable to dispense drops of the liquid present in cavity (20).

9. The device according to any of the preceding claims, **characterized in that** said grip (16) is formed by two complementary half-shells tied with each other, and has an opening shielded by a movable plug (22) to let in the liquid into cavity (20).

10. The device according to any of the preceding claims, **characterized in that** tube (18) connected to reservoir (12) and grip (16) is of the coiled type and located in a shaped seat (30) formed in said reservoir.

11. The device according to any of the preceding claims, **characterized in that** the mouth of the shaped seat (30) has a serration (60) for hooking the rear part of grip (16) to reservoir (12).

12. The device according to any of the preceding claims, **characterized in that** on reservoir (12) a flat zone (62) is formed that supports the front part of grip (16) that fittingly engages in an extension (64) obtained along said flat zone (62).

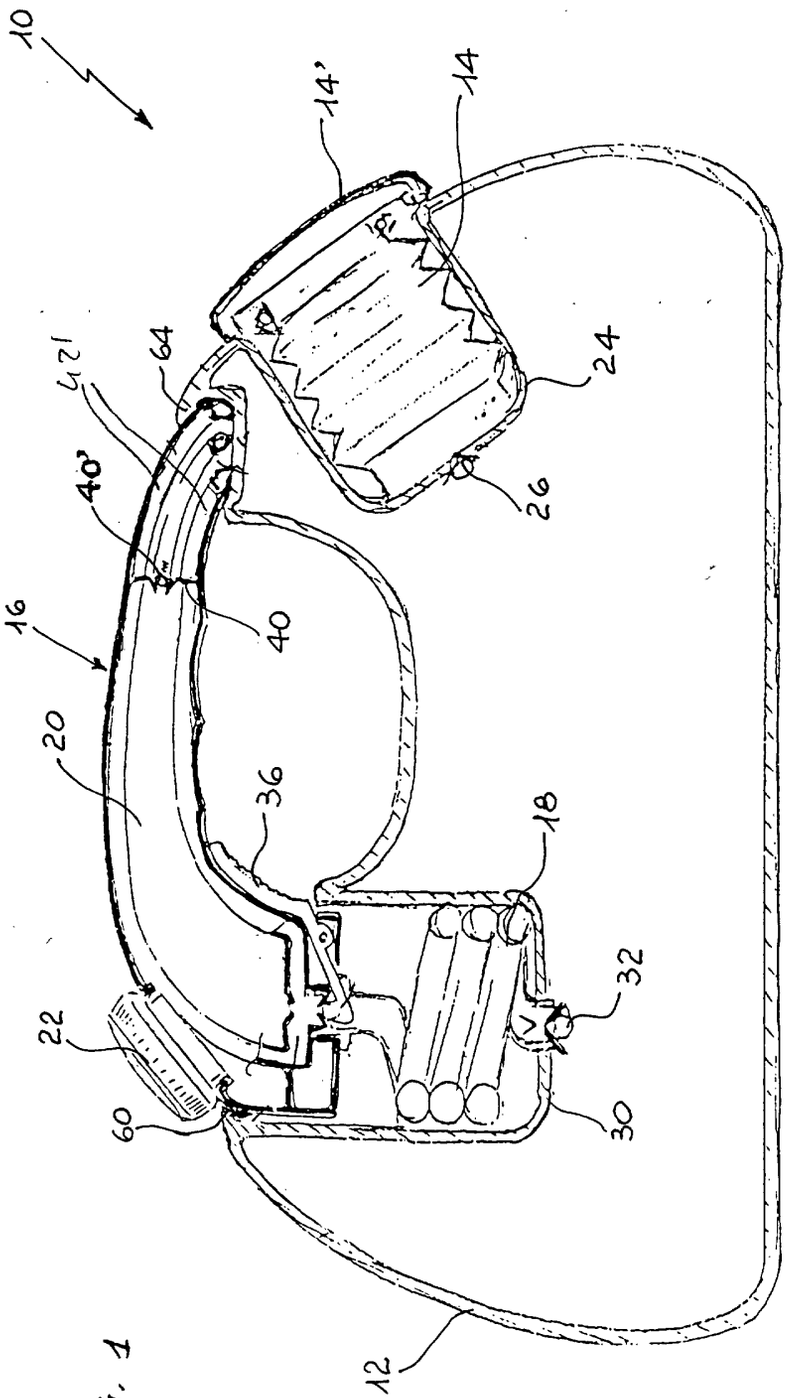

10
14'
14
24
64
42
40'
26
16
40
20
36
18
32
22
60
30
12

FIG. 1

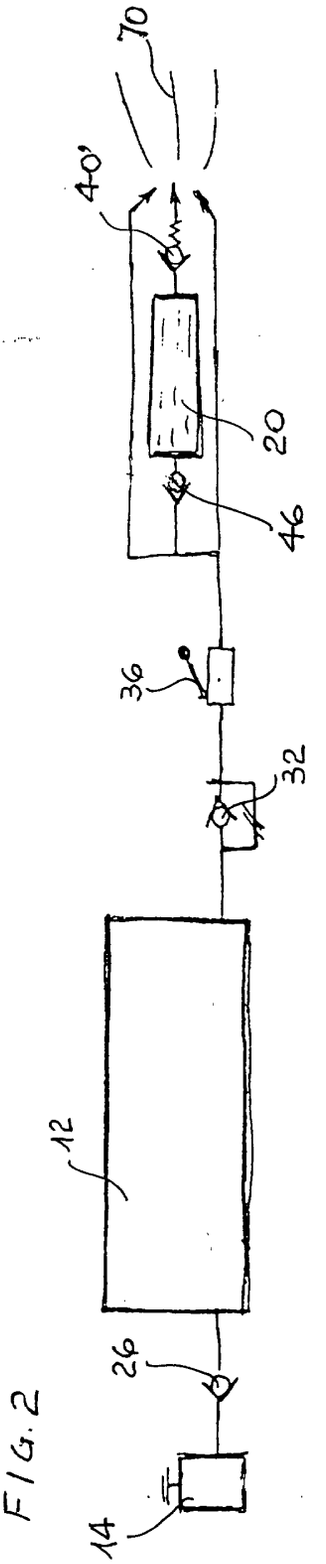
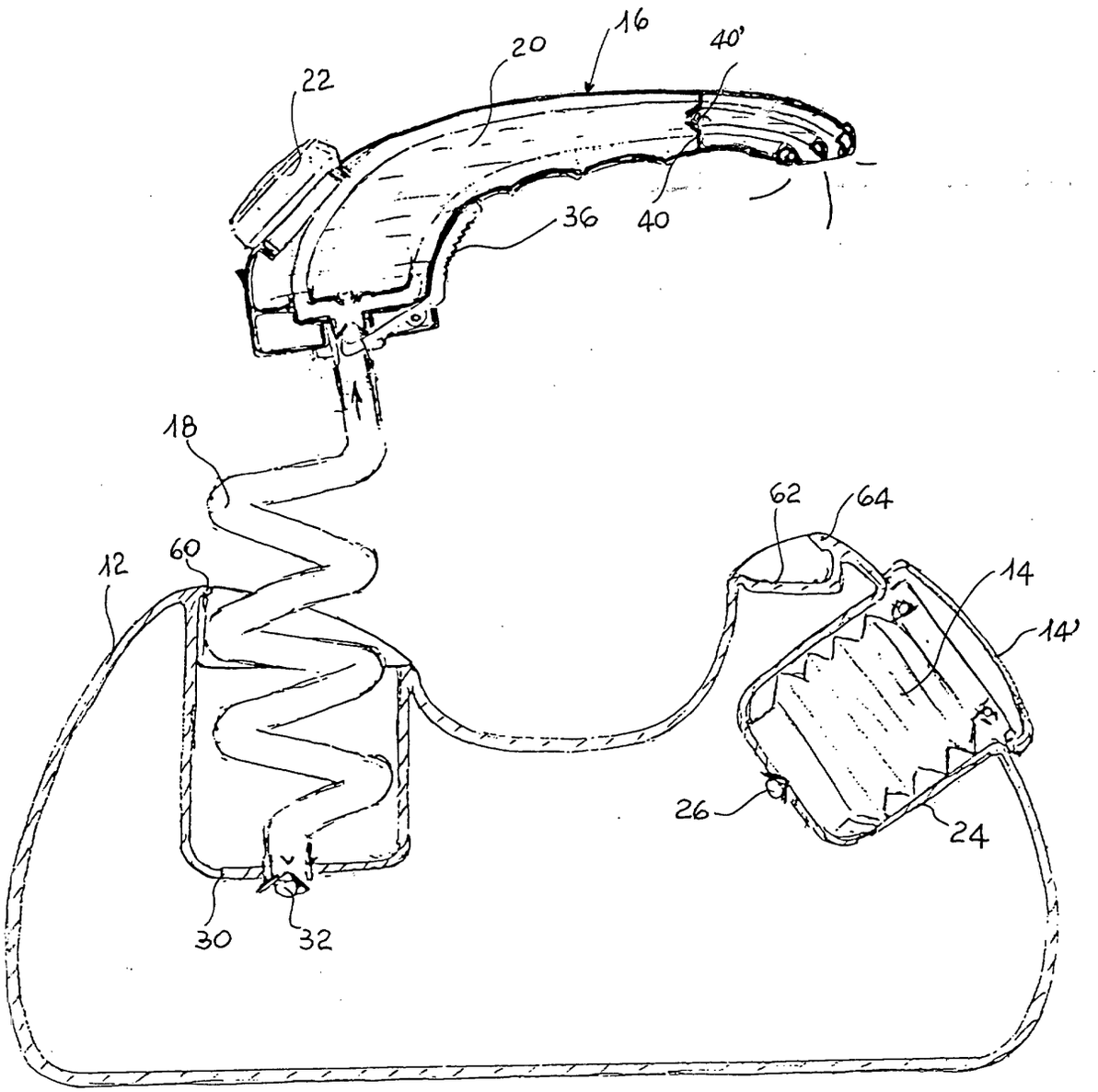

70
40'
20
46
36
32
12
26
14

FIG. 2

FIG. 3.



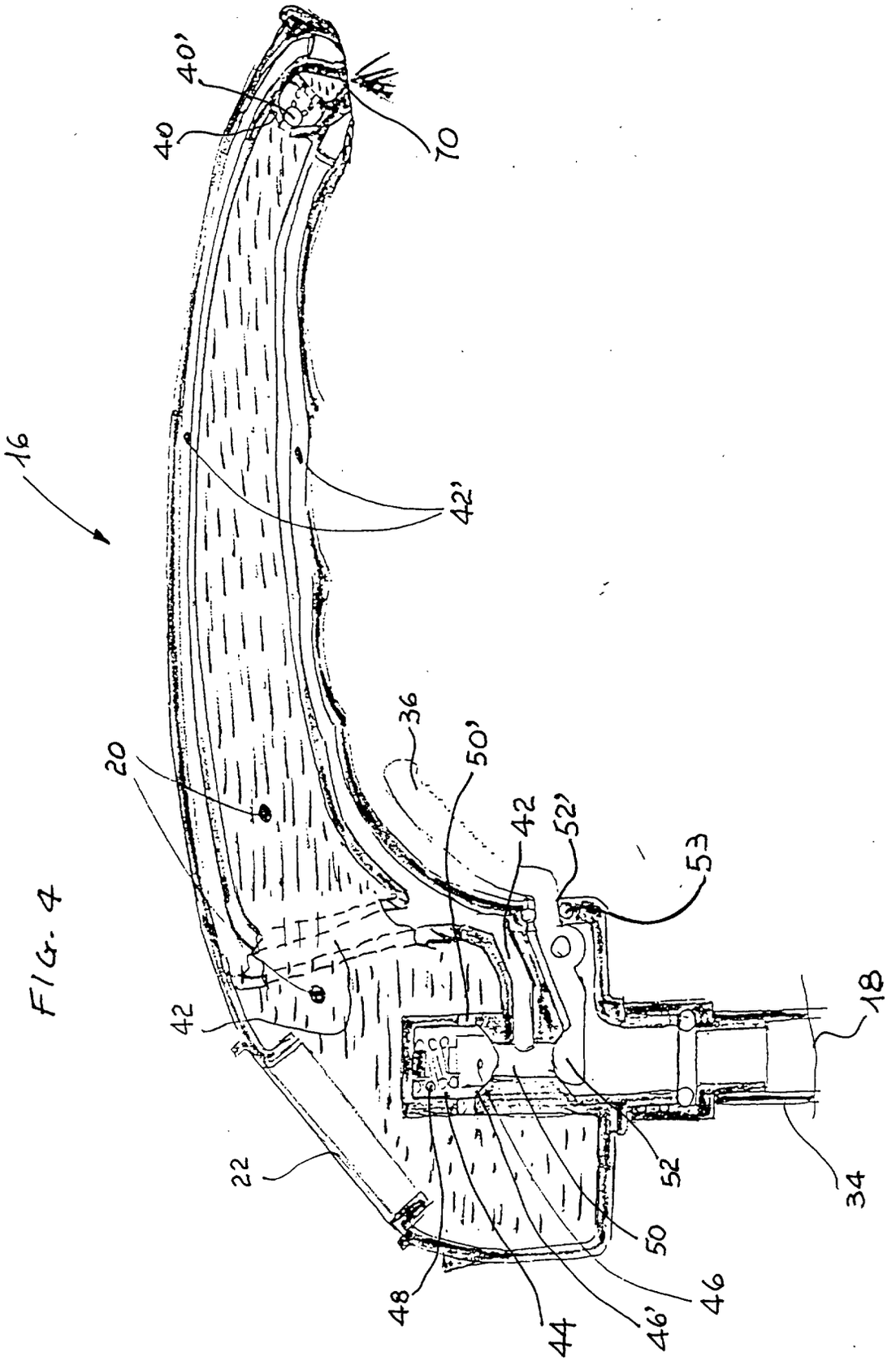


FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 01 11 5167

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.7)
A	US 5 535 951 A (UTTER STEVEN) 16 July 1996 (1996-07-16) * column 2, line 50 - column 3, line 56; figure 1 *	1-12	B05B9/08
A	WO 96 11748 A (UTTER STEVEN M) 25 April 1996 (1996-04-25) * page 3, line 18 - page 4, line 23; figures *	1-12	
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A	US 6 095 434 A (MONTENEGRO LEONARD) 1 August 2000 (2000-08-01) * column 4, line 18 - line 37; figures *	1-12	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	21 November 2001	Daintith, E

CATEGORY OF CITED DOCUMENTS

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