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(54) Apparatus for the aesthetic treatment of the extremities of the limbs of the human body with garra rufa or similar fish

(57) An apparatus (10) for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, comprising a seat (11.21; 11.2) in front of a lower water tank (14.1), open and forming an aquarium for Garra rufa or similar fish, in a manner such that the user occupying said seat can immerse the extremities of their lower limbs (i.e. ankles and feet) in this tank for an aesthetic treatment of these extremities.

According to the invention, the apparatus comprises at least another water tank, open and forming an aquarium for Garra rufa or similar fish, which:
- is hydraulically connected in a closed circuit (22, 23, 24; 29, 30, 31) with respect to said lower water tank (14.1), in a manner such that the treatment water can be recirculated (Pi) between said water tanks (14.1, 14.2),
- is accessible by the user with at least one extremity (i.e. at least wrist and hand) of an upper limb thereof, and
- has the free surface of the water above the free surface of the water of said lower tank (14.1),

and by comprising in said closed circuit filtration and purification means (Vf, Fb, Fc) , thermal conditioning means (Vr, Rs) and sterilization means of the recirculated treatment water, in a manner such that said apparatus:
- allows the user to perform a comfortable and safe aesthetic treatment also of the extremities of the upper limbs of their body occupying said seat clothed,
- is functionally independent from any water supply network,
- contains a sufficiently large mass of treatment water to allow both correct purification, filtration and sterilization of the water for the hygiene of the person and the health of the fish and the appropriate thermoregulation of the water useful both for the fish and for the person. (Fig. 3)

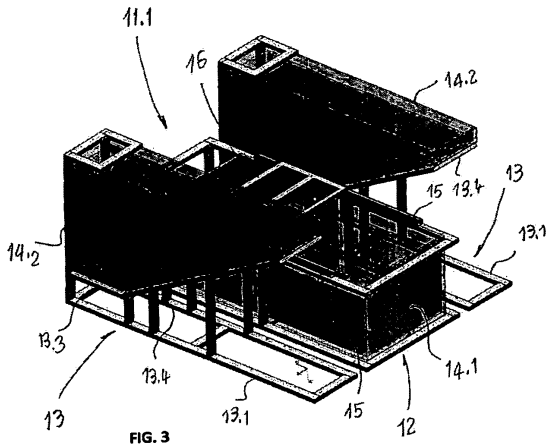


FIG. 3

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Description

[0001] The present invention relates to an apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish.

[0002] Garra rufa fish are conventionally used in Asian countries to perform aesthetic treatments of a person's feet (known as "fish pedicure"), which consist of immersing the person's feet in a small aquarium containing live Garra rufa fish.

[0003] This treatment is carried out, for example, in spa environments, where a typical treatment station comprises a fixed seat, in front of and above a fixed tank of thermal treatment water, all produced, for example, in masonry. The thermal treatment water (for example at 30 - 35°C) can be stationary or can pass through the tank. The person occupying the seat maintains their feet immersed in the tank for a given treatment time, during which the Garra rufa fish remove the "dead skin" from the person's feet, thereby improving their appearance.

[0004] Moreover, the aforesaid treatment is also carried out in beauty centres, where a seat is positioned in front of a small aquarium, placed on the ground and containing live Garra rufa fish. In this case, the treatment water is taken from the water network, heated to the appropriate temperature for the survival of the fish and fed into the aquarium, in which a person's feet are immersed, for the time necessary for treatment. However, a relatively small quantity of water is contained in the aquarium, which is therefore generally not sufficient for the wellbeing of the fish. Moreover, this water is not treated correctly (purification, sterilization, etc.), with risks for the person's health. Besides, correct thermal conditioning of the water is not guaranteed in an aquarium of the type specified.

[0005] From the document EP1398017A1 there is known an apparatus for the aesthetic treatment of the human body with live Garra rufa or similar fish. This apparatus includes a bath tub containing the live fish, for immersion of the body of the person to be treated, and a mechanism for treatment of the water contained in this tub. This mechanism comprises a filter pump, to which the water removed from the tub can be fed, and a sterilization device, through which the water can be returned to the tub downstream of the filter pump. Moreover, a mechanism for exchange and thermal control of the water in the tub is provided, comprising means for discharging the used water from the tub and means for feeding fresh water into the tub at a controlled temperature, through a water mixer to which cold water and hot water are fed according to need. The water sterilization device includes a filter of the ultraviolet (UV) ray type.

[0006] This apparatus, which requires immersion of the person's body, entails the use of a relatively large mass of treatment water and, consequently, high energy expenditure for the circulation and filtration thereof. Moreover, as the treatment water is fed into the treatment tub directly from the water mains, the apparatus must necessarily occupy a fixed station, provided with connections for inflow and outflow of the water.

[0007] The document CN201019300 describes an armchair for the aesthetic treatment of the extremities of the limbs of the human body, which comprises, below the seat, a tank sliding between a withdrawn position concealed inside the armchair and an extracted position in front of the seat, in which the tank can receive the person's feet for a footbath. Moreover, each armrest of the armchair is provided with a respective tank which can contain water for immersion of a person's corresponding hand, for example for treatment of the fingernails.

[0008] In this armchair the treatment water tanks are not communicating with one another, nor are they provided with thermal conditioning and/or sterilization means or the like for the treatment water. In particular, the tanks provided in the armrests of the armchair are completely unsuitable for the function of aquarium, given their small water-carrying capacity.

[0009] The present invention, starting from the notion of the aforesaid drawbacks, intends to provide a remedy.

[0010] An object of the invention is to provide an apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, which allows the user to perform the aesthetic treatment of the extremities of all the limbs, clothed and in a comfortable seated position.

[0011] Another object of the invention is to provide an apparatus as indicated which is functionally independent from the water supply network, forms a mobile treatment unit, contains a sufficiently large mass of treatment water to allow correct purification and sterilization for the hygiene of the person and the health of the fish and allows heat regulation of the water useful both for the fish and for the person.

[0012] A further object of the present invention is to provide an apparatus of the type specified that allows remote monitoring of the quality of the treatment water contained in this apparatus.

[0013] In view of these objects, the present invention provides an apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, the essential characteristic of which forms the subject matter of claim 1.

[0014] Further advantageous characteristics are described in the dependent claims.

[0015] The aforesaid characteristics are intended as fully incorporated herein.

[0016] The present invention will be more apparent from the detailed description below, with reference to the accompanying drawing, provided purely by way of non-limiting example, wherein:

- Fig. 1 is a perspective exploded view of a metal frame of the apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, according to a first embodiment of the invention;
- Fig. 2 is a perspective view of the frame of Fig. 1,

mounted on which is an armchair of the apparatus according to said embodiment of the invention;

- Fig. 3 is a perspective view of the frame of Fig. 1, without said armchair but installed in which are three water tanks of the apparatus according to said embodiment of the invention;
- Fig. 4 is a perspective view of the apparatus according to said embodiment of the invention, in which said frame is completed both with said armchair and with said water tanks;
- Fig. 5 is a schematic and three quarter perspective top view of the arrangement of water tanks of Fig. 4, but without frame and armchair;
- Fig. 6 is a top plan view of the arrangement of water tanks of Fig. 5;
- Fig. Fig. 7 is a view similar to the view of Fig. 5, but in a bottom perspective view;
- Fig. 8 is a block diagram illustrating operation of the aforesaid hydraulic circuit.

[0017] In the drawings, the reference numeral 10 (Fig. 4) indicates as a whole the apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, according to an example of embodiment of the invention.

[0018] The apparatus 10 comprises, first of all, a modular frame 11. 1 and an armchair 11.2 supported sliding with respect to said frame 11. 1.

[0019] Said frame 11.1 comprises a central support 12 formed by two horizontal rectangular frameworks 12a, 12b, made of metal section bars, overlapped and spaced apart by means of vertical uprights, also made of metal section bars, so that the frame itself delimits three compartments: 12.1, front, 12. 2 intermediate, and 12.3, rear, respectively. Each direction parallel to that of the longer sides of the frameworks 12a, 12b is referred to hereunder as "longitudinal direction".

[0020] Moreover, the frame 11 comprises two lateral supports 13, identical, juxtaposed on opposite sides with respect to said central support 12 and each comprising a horizontal rectangular base framework 13.1 and a plurality of vertical uprights 13.2 of different heights, which support on said base framework 13.1 both a small horizontal framework 13. 3, arranged at intermediate height and above the rear end area of the base framework 13.1, and an inclined framework 13. 4, connected to said small framework 13.3 and having a trend ascending upward toward the front end area of said base framework 13.1. The longer sides of each base framework 13.1 extend in said longitudinal direction.

[0021] In the front compartment 12.1 of the central support 12 there is contained a lower front tank 14.1, of relatively large dimensions, to contain treatment water, open at the top and substantially in the shape of a parallelepiped rectangle, while the small horizontal framework 13.3 and the inclined framework 13.4 of each lateral support 13 support a respective upper lateral tank 14.2 to contain treatment water, open at the top and substantially prismatic, with lateral faces in the shape of a trapezium rectangle, the bases of which extend according to said longitudinal direction; the width of said upper lateral tank 14.2 is contained in the transverse dimension of the respective lateral support 13.

[0022] It must be noted that, when said tanks 14. 1, 14.2 are substantially full of water, the free surface of the water in the upper tanks 14.2 is greatly above the free surface of the water in the lower tank 14.1.

[0023] Said upper lateral 14.2 and lower front 14.1 water tanks are hydraulically connected in a closed circuit with forced water recirculation. In particular, with reference to Figs. 5 to 8:

- said upper 14.2 and lower 14.1 tanks are hydraulically connected to corresponding inlets of a first four-way hydraulic connector 21, through respective hydraulic overflow valves 22, 24, that ensure the desired water level is maintained in said tanks;
- the outlet of said four-way connector 21 is hydraulically connected to a hydraulic inlet of a filtration and purification tank Vf, housed in the intermediate compartment 12.2 of the central support 12 of the frame 11.1. Inside said filtration tank Vf the water flowing from said tanks 14.1, 14.2 is forced to follow a filtration and purification path through a plurality of biological (Fb) and chemical (Fc) filter means, until reaching a hydraulic outlet 25;
- said hydraulic outlet 25 from the filtration tank Vf is hydraulically connected to a corresponding hydraulic inlet 26 of a heating tank Vr, in which the filtered water is forced to penetrate. In said heating tank Vr, contained in said rear compartment 12.3 of the central support 12, there are provided hydraulically sealed resistance means (Rs), such as an submerged automatic heater device that heats and maintains the water at the desired treatment temperature, for example through thermostatic control means;
- downstream of said heating tank Vr there is provided a hydraulic suction and discharge pump Pi of the treatment water heated in this tank Vr; the heated water is forced by this pump to flow out downstream through sterilization filter means Uv, for example a disinfection chamber irradiated with ultraviolet rays;
- a hydraulic outlet 27 from said sterilization filter means Uv is hydraulically connected to a corresponding inlet of a second four-way hydraulic connector 28, having three outlets respectively connected with seal to corresponding hydraulic inlets 29, 30, 31 of said upper 14.2 and lower 14.1 tanks, in which the treatment water is forced to flow, after being purified, heated and sterilized.

[0024] Said hydraulic inlets and outlets to and from said water tanks are produced, for example, through respective hydraulic valves with tap (Vi).

[0025] In the diagram of Fig. 8, broken lines indicate the path of the water to be treated, starting from the hydraulic outflow valves, indicated with Vi S, while the unbroken line indicates the path of the treated water, which is fed to the hydraulic inflow valves indicated with Vi C.

[0026] Regulation of the water level in the upper tank 14.1 is guaranteed through the water recirculation means described above. However, the water that is dispersed through evaporation during the treatment cycle is topped up periodically, in an appropriate manner, for example also through a simple manual operation by the operator.

[0027] The water is treated in the aforesaid closed hydraulic circuit, comprising said water tanks 14.1, 14.2, as the water of an aquarium for Garra rufa or similar fish, and is also sterilized to ensure that the treatment is hygienic for the person undergoing it.

[0028] A pair of prismatic rectilinear sliding guides 15 (Figs. 1 - 3) oriented in said longitudinal direction, is fastened on the upper horizontal framework 12a of said central support 12. Besides, a corresponding slide with rectangular framework 16, made of metal section bars, is engaged by sliding in said longitudinal direction with respect to said rectilinear guides 15. The length of the travel of said slide 16 is defined by appropriate limit stop means, not shown, which allow the slide to travel substantially along the complete length of said upper framework 12a of the central support 12. Sliding of the slide 16 along said guides 15 is guaranteed, for example, through suitable ball bearings or wheels.

[0029] Said armchair 11.2 is fastened with respect to said sliding slide 16, in a manner such that the armchair can be arranged by the user in a forward position, in which the seat thereof 11.21 projects partially beyond said central support 12 and said lower front tank 14.1, allowing the user to sit down comfortably, and a retracted position, in which its seat 11.21 is partially moved back with respect to said lower front tank 14.1, allowing the user to immerse the extremities of their legs (ankles and feet) in this tank. Besides, said armchair 11.2 has a pair of arms 11.22 adjacent respectively to said lateral tanks 14.2 and which allow the seated person to rest their elbows to immerse the lower part of the arms (wrists and hands) in these tanks.

[0030] Operation of the apparatus for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish is immediately apparent: these fish are placed in said tanks 14. 1, 14.2, which act in the same manner as aquariums hydraulically connected in a closed circuit, therefore with the advantage of comprising a relatively large mass of recirculating water. This mass of water is treated continuously, so as to ensure both the wellbeing of the Garra rufa fish, and the hygiene of the persons undergoing the aesthetic treatment with the apparatus according to the invention, immersing the extremities of their limbs in the water tanks 14. 1, 14.2 for a suitable time. The apparatus 10 according to the invention can also comprise means, not shown, for controlling the quality of the treatment water in the tanks 14.1, 14. 2, such as those provided in aquariums and comprising, for example, a control unit and a power supply section, with power outlets and inlets of probes for monitoring and automatic regulation, on the basis of set limits, of the main chemical-physical characteristics of the water.

[0031] Said means for controlling the quality of the treatment water can also be connected electronically with respect to one or more remote monitoring and control stations.

Claims

1. An apparatus (10) for the aesthetic treatment of the extremities of the limbs of the human body with Garra rufa or similar fish, comprising a seat (11.21; 11. 2) in front of a lower water tank (14.1), open and forming an aquarium for Garra rufa or similar fish, in a manner such that the user occupying said seat can immerse the extremities of their lower limbs (i.e. ankles and feet) in this tank for an aesthetic treatment of these extremities,
characterized by comprising at least another water tank, open and forming an aquarium for Garra rufa or similar fish, which:

    - is hydraulically connected in a closed circuit (22, 23, 24; 29, 30, 31) with respect to said lower water tank (14.1), in a manner such that the treatment water can be recirculated (Pi) between said water tanks (14.1, 14.2),
    - is accessible by the user with at least one extremity (i.e. at least wrist and hand) of an upper limb thereof, and
    - has the free surface of the water above the free surface of the water of said lower tank (14.1),

    and by comprising in said closed circuit filtration and purification means (Vf, Fb, Fc), thermal conditioning means (Vr, Rs) and sterilization means of the recirculated treatment water, in a manner such that said apparatus:

    - allows the user to perform a comfortable and safe aesthetic treatment also of the extremities of the upper limbs of their body occupying said seat clothed,
    - is functionally independent from any water supply network,
    - contains a sufficiently large mass of treatment water to allow both correct purification, filtration and sterilization of the water for the hygiene of the person and the health of the fish and the appropriate thermoregulation of the water useful both for the fish and for the person.

2. The apparatus according to claim 1, **characterized**

by comprising a frame (11.1) and an armchair (11. 2) supported sliding with respect to said frame (11.1), which contains and/or supports said treatment water tanks (14.1, 14.2), in a manner such that said apparatus forms a portable treatment unit.

3. The apparatus according to claim 2, **characterized in that** said frame is modular and comprises a central support (12) and two lateral supports (13), juxtaposed on opposite sides with respect to said central support (12) and **in that** said lower front tank (14.1) for treatment water, open at the top, is contained in said central support (12), while a respective lateral tank (14.2) for treatment water, open at the top, is contained in each lateral support (13).

4. The apparatus according to claim 2 and/or 3, **characterized in that** on a central part of said frame (11.1) forming a so-called central support (12), said armchair (11.2) is supported sliding between a forward position, in which said seat (11.21) projects partially beyond said central support (12) and said lower front tank (14.1), allowing the user to sit down comfortably, and a retracted position, in which said seat (11.21) is at least partially moved back with respect to said lower front tank (14.1), allowing the user to immerse the extremities of their legs (i. e. ankles and feet) in this tank.

5. The apparatus according to claim 3 and/or 4, **characterized in that** said armchair (11.2) has a pair of arms (11.22) adjacent respectively to said lateral tanks (14.2) which allow the seated person to rest their elbows to immerse the lower part of the arms (i.e. wrists and hands) in these tanks.

6. The apparatus according to claim 1, **characterized in that** said water tanks (14.2, 14. 1) are hydraulically connected to one another in a closed circuit with water recirculation, in which:

- said upper (14.2) and lower (14.1) tanks are hydraulically connected to corresponding inlets of a first hydraulic connector (21), through hydraulic means (22, 23, 24; Pi) that ensure the desired water level is maintained in said tanks;
- the outlet of said connector (21) is hydraulically connected to a filtration and purification tank (Vf), in which the water flowing back from said tanks (14.1, 14.2) is forced to follow a filtration and purification path through a plurality of biological (Fb) and chemical (Fc) filter means, until reaching a hydraulic outlet (25);
- said hydraulic outlet (25) from the filtration tank (Vf) is hydraulically connected to a corresponding hydraulic inlet (26) of a heating tank (Vr), in which the filtered water is forced to penetrate and in which electric heating means heat and maintain the water at the desired treatment temperature;
- a hydraulic suction and discharge pump (Pi) forces the heated treatment water in this tank (Vr) to flow out downstream through sterilization filter means (Uv), while
- a hydraulic outlet (27) from said sterilization filter means (Uv) is hydraulically connected to a corresponding inlet of a second hydraulic connector (28), having outlets respectively connected in a sealed manner with corresponding hydraulic inlets (29, 30, 31) of said water tanks (14.2 and 14.1), into which the treatment water, after being purified, heated and sterilized, is forced to flow.

7. The apparatus according to claim 1, **characterized by** comprising means for controlling the quality of the treatment water in the tanks (14.1, 14.2), including a control unit and a power supply section, with power outlets and inlets of probes for monitoring and automatic regulation, on the basis of set limits, of the main chemical-physical characteristics of the water.

8. The apparatus according to claim 7, **characterized in that** said means for controlling the quality of the treatment water are connected electronically with respect to one or more remote monitoring and control stations.

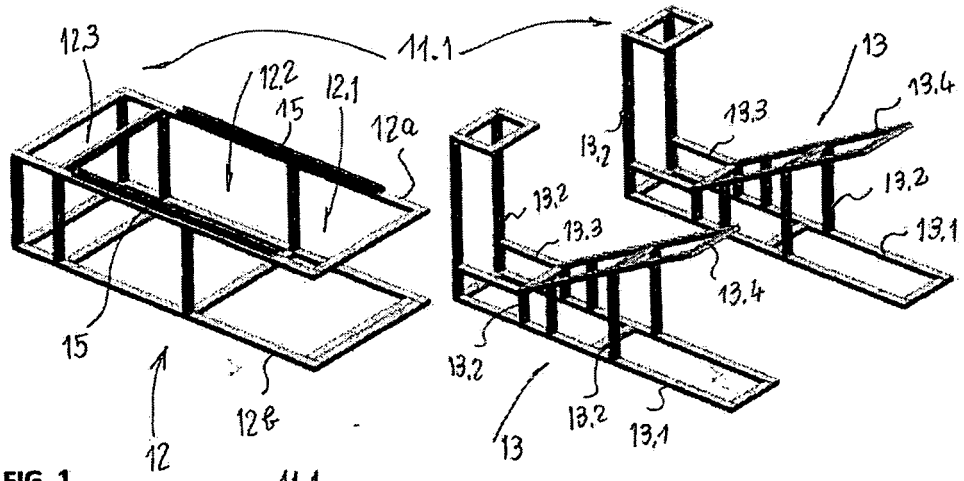

12.3
11.1
12.2
12.1
15
12a
13
13.4
13.3
13.2
13.2
13.3
13.2
13.1
13.4
15
12
12b
13.2
13
13.2
13.1

FIG. 1

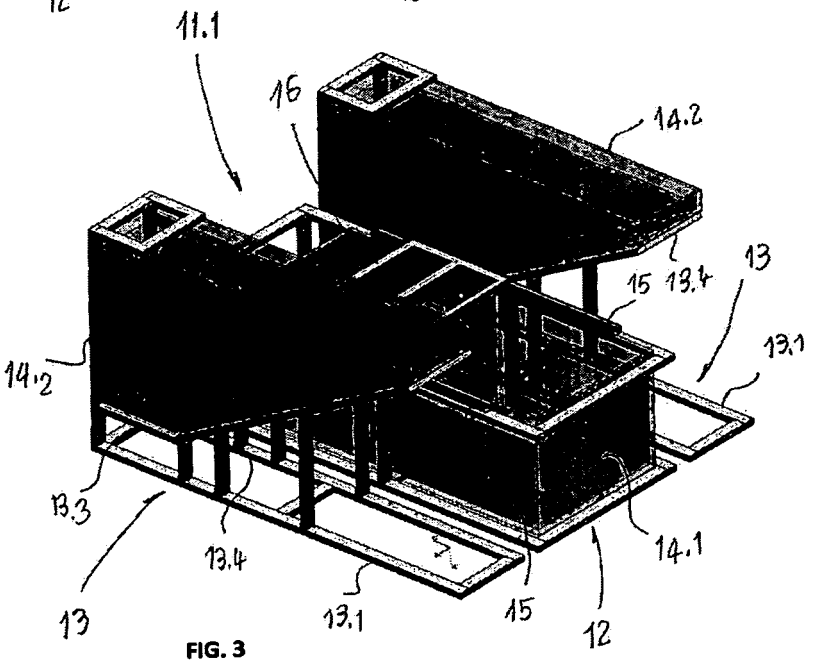

11.1
16
14.2
13
15
13.4
13.1
14.2
13.3
13.4
14.1
13
13.1
15
12

FIG. 3

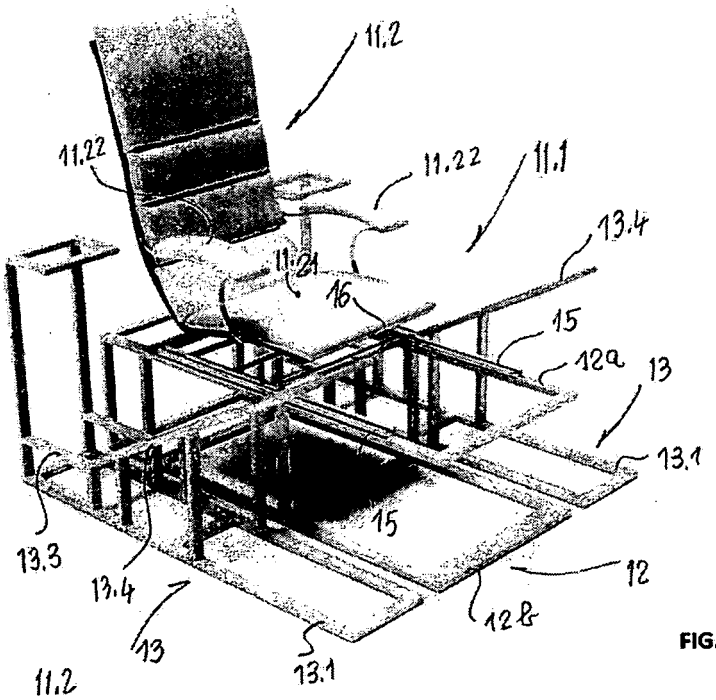

11.2
11.22
11.22
11.1
13.4
11.21
16
15
12a
13
13.1
15
13.3
13.4
13
13.1
12
12b

FIG. 2

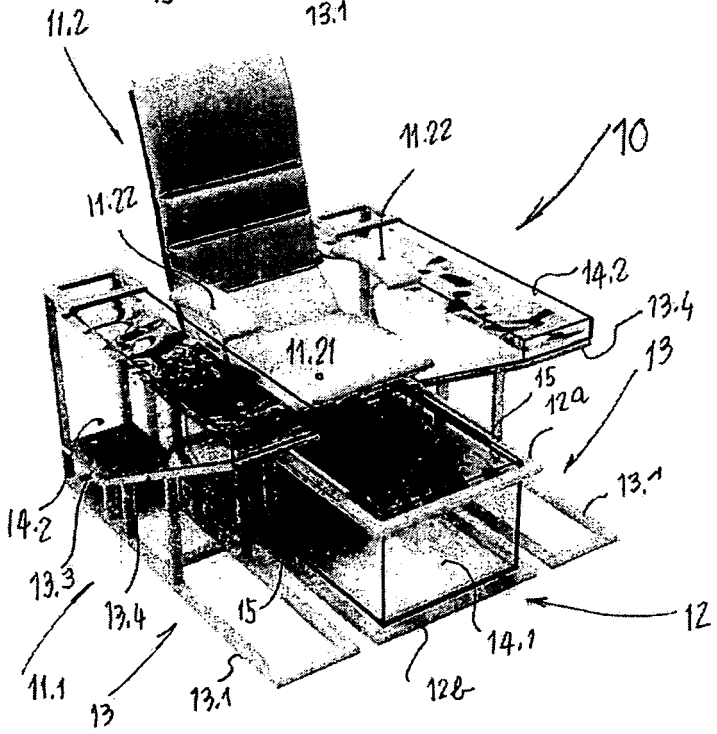

11.2
11.22
10
11.22
14.2
13.4
11.21
15
12a
13
13.1
14.2
13.3
13.4
15
12
14.1
11.1
13
13.1
12b

FIG. 4

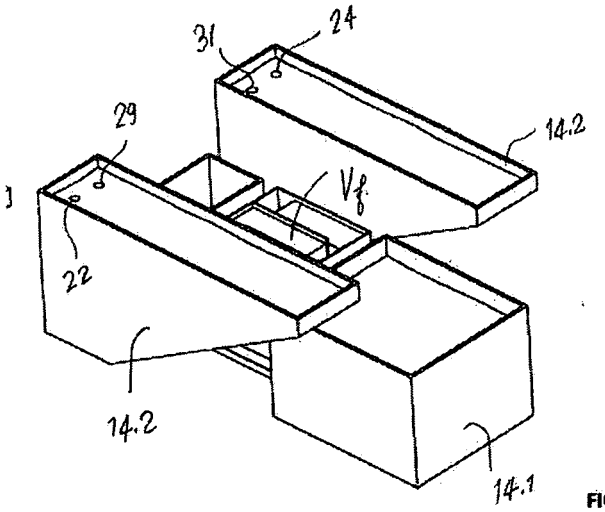


FIG. 5

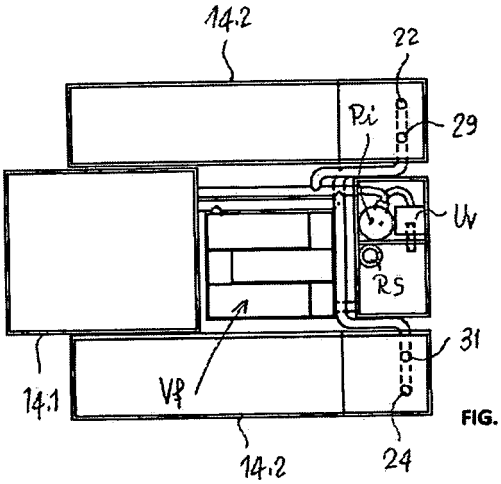


FIG. 6

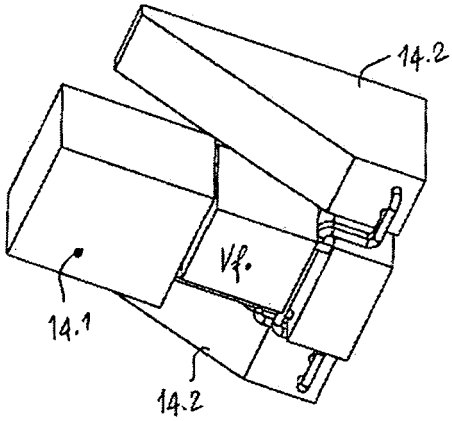


FIG. 7

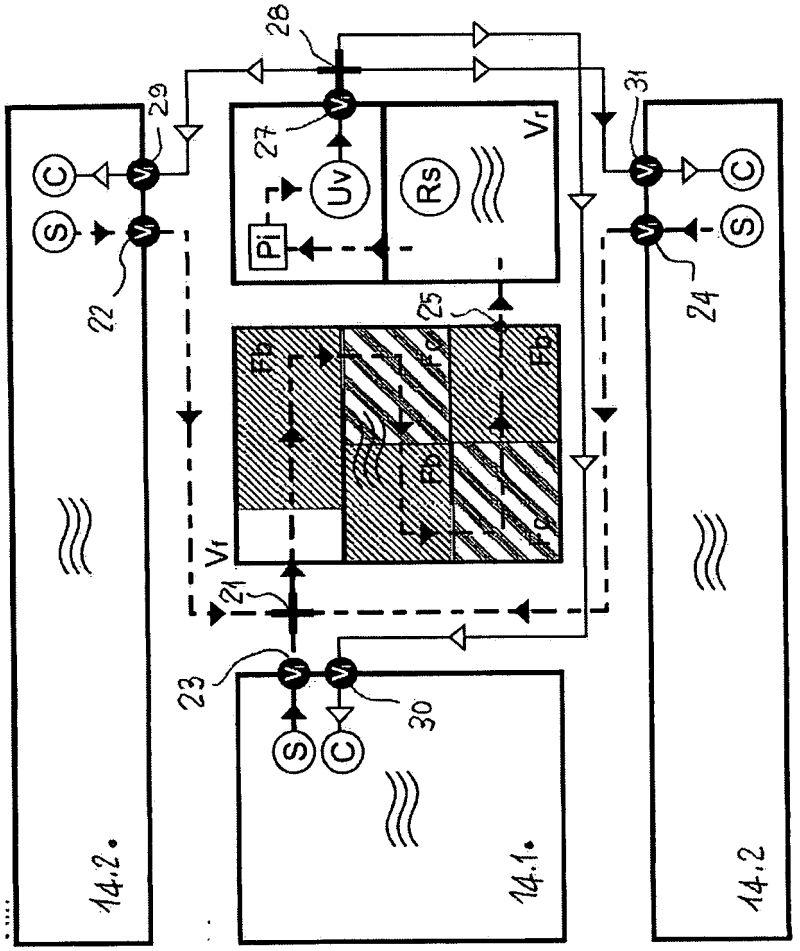

28
29
27
31
Uv
Rs
Pi
Vr
C
S
22
24
25
Eb
Eb
Eb
Eb
Vr
21
23
30
S
C
14.2
14.1
14.2

FIG.8

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EUROPEAN SEARCH REPORT

Application Number
EP 11 00 5384

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2010/139680 A1 (HO JOHN [US] ET AL) 10 June 2010 (2010-06-10) * the whole document *	1	INV. A61H35/00
A	EP 1 398 017 A1 (GULARAS THOMAS [AT]) 17 March 2004 (2004-03-17) * paragraphs [0022], [0029] *	1	
A	US 2004/201262 A1 (MCBRIDE PETER [CA]) 14 October 2004 (2004-10-14) * figure 4a *	1	
A	DE 10 2004 005870 B3 (SUCHEFORT D EMANUEL [DE]) 24 February 2005 (2005-02-24) * paragraph [0002] *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A61H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 October 2011	Knoflacher, Nikolaus

CATEGORY OF CITED DOCUMENTS

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1

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28-10-2011

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