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(71) Applicant: **Maletti S.p.A.**
42019 Scandiano (RE) (IT)

(72) Inventor: **MALETTI, Guido**
42019 Scandiano (RE) (IT)

(74) Representative: **Manzella & Associati**
Via dell'Indipendenza, 13
40121 Bologna (IT)

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(54) **LIFTING SUPPORT DEVICE FOR A CHAIR**

(57) The lifting support device for a chair (1), in particular for hairdresser salons, comprises a base (2), a mobile support frame (3) predisposed to be mounted on a seat (4) of the chair (1), a lifting assembly (7) associated

with the support frame (3) to perform a variation in the height of the seat (4), control means (9) for controlling such variation.

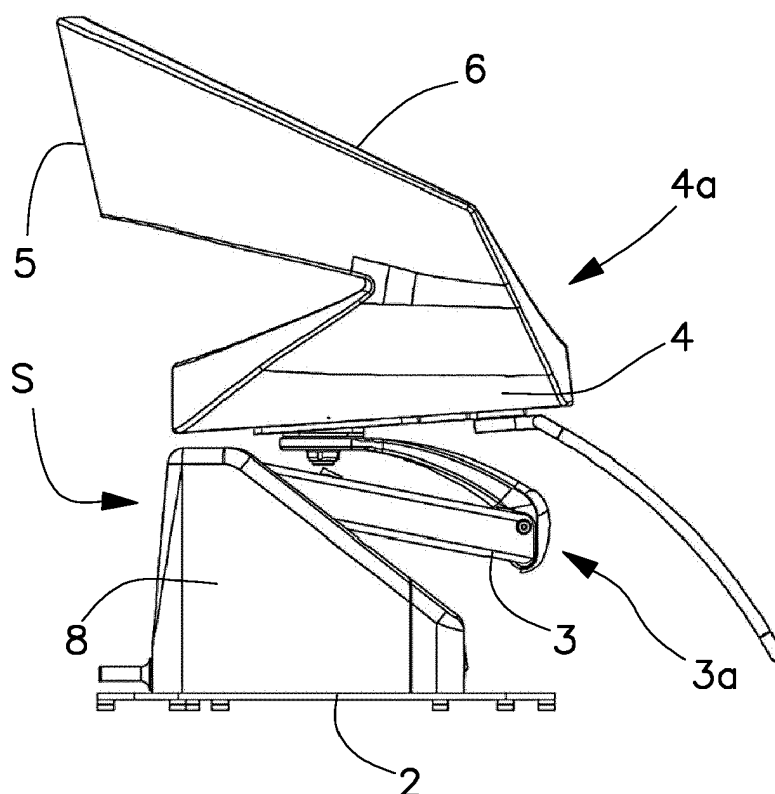


Fig.1

Description

Technical Field

[0001] The present invention concerns a lifting support device for a chair, in particular a hairdresser chair, and a chair provided with such lifting support device.

Background Art

[0002] It has been known the use of chairs, in particular in hairdresser salons, provided with a seat and a backrest, preferably padded, supported by a suitable support frame. The hairdresser can make the customer sit on the chair seat, in order to carry out the required treatment operations, such as cutting or washing the hair.

[0003] Such known chairs are usually adjustable in height, to compensate for the difference in height that can exist between one customer and the other, as well as between different operators.

[0004] To this end, hairdresser chairs so far known are equipped with lifting assemblies predisposed to allow an adjustment in height of the seat.

[0005] However, known chairs provided with such lifting assemblies do not fully meet the ergonomic needs of the specific field, as the attained height excursions are limited. More precisely, such excursions do not permit to compensate for the variation in height that is presently going on in the population, particularly in the population who frequently attend hairdresser salons.

[0006] In addition, known types of lifting assemblies may require an excessive effort from the operator to adjust the seat height and/or control the respective actuators. Some lifting assemblies can work differently, upwards and downwards, with different results, for example unsatisfactory downwards, for example to the disadvantage of ergonomics and/or safety.

Disclosure

[0007] The task of the present invention is to solve the aforementioned problems, by devising a lifting support device for a chair, in particular for a hairdresser chair, which meets the ergonomic needs of users and operators.

[0008] Within such task, it is a further scope of the present invention to provide a hairdresser chair ergonomic and safe in any operating condition, for both the operator and the user.

[0009] A further scope of the invention is to provide a support device for a chair and a hairdresser chair of simple constructive and functional conception, of versatile use, surely reliable functioning and relatively economic cost.

[0010] The cited scopes are reached, according to the present invention, by the lifting support device for a chair according to claim 1, as well as by the chair according to claim 7.

[0011] The lifting support device for a chair, in particular for hairdresser salons, comprises a base, an extensible mobile support frame, predisposed to be mounted on a seat of a chair, a lifting assembly associated with the support frame, to carry out a height variation of the support frame, control means for controlling such variation.

[0012] According to a feature of the invention, the support frame comprises an articulated system having at least a first arm and a second arm articulated to each other to move from a folded configuration to an extended one.

[0013] The lifting assembly further comprises an exclusively electric motor member connected with a sliding rod predisposed to operate the same sliding rod which is articulated in turn between the first arm and the second arm, alternately between a retracted position, corresponding to a configuration of maximum fold of the support frame, and an extracted position, corresponding to a configuration of maximum extension of the support frame itself.

[0014] Preferably, the motor member transmits motion to the sliding rod through transmission means.

[0015] Preferably, the motor member operates in rotation a respective motor shaft arranged according to a substantially horizontal axis.

[0016] Preferably, said transmission means comprise gears of the worm gear type so as to convert the rotation motion of said motor shaft into a linear motion of said sliding rod.

[0017] Preferably, said transmission means do not include belt or chain means. In this way, the space required by the lifting assembly is optimized, this latter turning out to be compact.

[0018] The lifting support device also includes a rechargeable battery power system, which does not require any special modifications in the installation environment.

[0019] The rechargeable battery power system comprises a rechargeable battery, housed on said base, in a housing zone adjacent to said electric motor member for powering said electric motor member, and a control panel equipped with means for activating the charging of a rechargeable battery, and with means for connecting with a power supply source, the panel being arranged in front of an extractable drawer placed on said base so as to allow inspection of the battery itself.

[0020] This arrangement of the control panel is particularly advantageous because it allows for easy inspection of the battery and additional electrical connections being in the housing area and to quickly access the battery charging connection and activation means to recharge the battery in case of necessity. Therefore, the time required to activate the power supply system, its maintenance and/or replacement is optimized, with a consequent advantage in terms of comfort of use of the device.

[0021] The battery is advantageously removable from the device, to be inspected or replaced when needed.

[0022] Preferably, the support frame comprises an articulated parallelogram, configured for maximum and optimal excursion of the lifting device.

[0023] The invention also relates to a hairdresser chair comprising a seat mounted on said lifting support device.

[0024] Advantageously, said seat is mounted rotatably on the support frame around a substantially vertical axis so as to enable an operator to correspondingly direct the user sitting on the seat while performing the required treatment operations.

[0025] Preferably, the seat is hinged about a pin inserted into a respective insertion element carried by the support frame.

[0026] Advantageously, the chair provides a series of stop seats obtained on a support portion integral with said insertion element, said seats being provided at pre-determined angular distances.

[0027] Preferably, the angular distances are regularly distributed around the pin.

[0028] Preferably, the chair comprises stop means integral with said seat, operated by respective elastic means predisposed to intercept respective stop seats so as to temporarily block the rotation of said seat.

[0029] The chair allows adjusting its height of a maximum excursion, that is greater than that allowed by the lifting systems of the known type and to change the seat orientation according to the needs of the user and of the operator in charge of the operations required, thus meeting the ergonomic needs of both the user and the operator.

[0030] In addition, the chair, thanks to the battery power supply system of the lifting support device, can be easily moved to any location of the beauty salons.

Description of Drawings

[0031] Details of the invention shall be more apparent from the detailed description of a preferred embodiment of the lifting support device for a hairdresser chair according to the invention, illustrated for indicative purposes in the attached drawings, wherein:

Figures 1 and 2 show a schematic side view of the hairdresser chair including the lifting support device according to the invention, respectively in a condition of maximum lowering and of maximum lifting;

Figure 3 shows a side view of a portion of the chair shown in figures 1 and 2, without the protection casing, in a lowered position;

Figures 4 and 5 respectively show perspective views, front and rear, of the lifting support device according to the invention, in a folded configuration, i.e., lowered;

Figures 6 and 7 respectively show a side and perspective view of the same lifting support device, in an extended configuration, i.e., lifted;

Figures 8, 9, 10 and 11 respectively show a perspective view according to opposite corners of the chair

according to the invention, in the above-mentioned lowered and lifted configurations.

Best Mode

[0032] With particular reference to such figures, the lifting support device for a chair 1 according to the invention is indicated in its entirety with S.

[0033] The lifting support device S for a chair 1 comprises a base 2 intended to be installed in use on the floor, and a support frame 3.

[0034] The chair 1 further comprises a seat 4 mounted on the support frame 3 and preferably associated with a backrest 5 and possibly with a pair of armrests 6 to allow a comfortable support for a user.

[0035] According to a preferred embodiment, the seat 4 is mounted in rotatable manner on the support frame 3.

[0036] Preferably, the seat 4 is hinged around a pin 31 inserted into a respective insertion element 32 carried by the support frame 3.

[0037] The seat 4 is preferably mounted on the support frame 3 and is rotatable about a substantially vertical axis, so as to enable the operator to correspondingly align the user sitting on the chair 1 during the treatment required, such as cutting hair or making a hairstyle.

[0038] Preferably, preferential stop positions may be provided at certain angular distances, blocking seat rotation 4 around the pin 31. For example, stop means integral to the seat 4 may be provided, for example in the shape of balls or grains, operated by respective elastic means, predisposed to intercept respective stopping seats 33 obtained at a support portion integral with the cited insertion element 32, at said angular distances, to temporarily block the rotation of the seat 4. Such angular distances can be regularly distributed around the pin 31, for example at a distance of 90° (see Figure 3).

[0039] The support lifting device S therefore comprises a lifting assembly 7 acting on the support frame 3 to perform a variation in the height of the seat 4 of the chair 1, when this is positioned on the floor of a beauty salon (see Figures 3 to 8).

[0040] The lifting assembly 7 is preferably protected by a covering element 8, preferably made of plastic or other suitable material, predisposed to protect the lifting assembly 7 for safety as well as for aesthetic reasons.

[0041] The lifting assembly 7 is operated by control means 9 to arrange the seat 4 at a desired height, between a lowered configuration 4a, at a minimum height, to a raised configuration 4b, at a maximum height (see Figures 1 and 2).

[0042] The lifting assembly 7 comprises an electric motor member 10 and a sliding rod 11 operated by the electric motor member 10 through transmission means, alternately mobile in any position comprised between a retracted configuration 11 a, corresponding to the cited lowered configuration 1 of the chair, and an extracted configuration 11 b, corresponding to the cited raised configuration of the chair 1 (see Figures 4 and 5).

[0043] Preferably, the transmission means further include a friction member, predisposed to disengage the transmission, in case of high dynamic stress on the mechanical parts of the lifting assembly 7, for example, for safety reasons, if an obstacle arises when folding the support frame 3.

[0044] The sliding rod 11 can slide inside a casing 12 fixed rotatably to the base 2 about a hinging pin 13 directed in use, for example, in substantially horizontal manner.

[0045] More precisely, the electric motor member 10 operates in rotation a respective motor shaft 14 arranged according to an axis, preferably, substantially horizontal. The cited transmission means, that preferably comprise gears of the type of a toothed wheel associated with a worm gear, transform the cited rotation motion of the motor shaft 14 into a linear motion of the sliding rod 11. The lifting assembly 7 is then very compact and cheap.

[0046] Preferably, the cited transmission means can be of the worm gear type with recirculating balls.

[0047] Preferably, the transmission means do not include belt or chain means for transmitting motion from the electric motor 10 to the sliding rod 11. In this way, the space required by the transmission means is further optimized and the lifting assembly 7 turns out to be more compact.

[0048] The longitudinal axis of the sliding rod 11 preferably lies on a plane orthogonal to the rotation axis around which the drive shaft 14 is operated, so as to produce the lifting and lowering of the seat 4 of the chair 1, maintaining a substantially horizontal orientation, to allow a stable support for the user, as described below.

[0049] The lifting assembly 7 is advantageously powered by exclusively power supply means.

[0050] To such scope, preferably alongside the motor member 10 a housing zone for power and supply members of the lifting assembly 7 is provided, in a very compact manner.

[0051] More precisely, such zone comprises seats which may house preferably a battery 15 electrically connectable with the motor member 10 and with any other possible loads of use of the chair 1, as described below.

[0052] The battery 15 is preferably of rechargeable type, through means of electrical connection, of the type of an electrical socket 15a, which can be operated by operation means of the type of a special button 15b. The electrical socket 15a and the button 15b can be arranged on a control panel 16, for example placed in front of the base 2 (see Figures 8 to 11) and then easily accessible.

[0053] Preferably, the panel 16 is mounted on the front of a removable drawer, to allow inspection of the battery 15 itself and of other electrical connections within the assembly.

[0054] This arrangement of the panel 16 is particularly advantageous as the operator, in addition to easily inspecting the battery 15 and other electrical connections, has immediate access to the electrical socket 15a and to the button 15b, which allows to quickly connect the

socket to a power source for charging the battery 15 or activate charging by the button 15b.

[0055] The battery 15 is advantageously removable from the device to be inspected or replaced when needed.

[0056] In addition, a control unit 17 connected with the cited control means 9 is advantageously housed on the base 2 to control the motion of the sliding rod 11 in the lifting and lowering (see Figure 5), or extending and folding steps of the support frame 3.

[0057] For example, said control means 9 may comprise a tilting element not shown in the Figures, for example having the shape of a pedal, hinged to a control pin 9a fixed to the base 2, advantageously in rear position, and associated with switch members, preferably of electric type, predisposed to operate the lifting of the seat 4, at one side of the pin 9a, and the lowering, at the opposite side. Consequently, such switch members operate the rotation of the motor shaft 14 of the motor member 10 in one direction or in the opposite direction.

[0058] The lifting assembly 7 performs the lifting and lowering of the seat 4 through the articulation to the support frame 3 coupled with the seat 4.

[0059] The support frame 3 shapes an articulated system comprising a first arm 18 articulated to the sliding rod 11 of the lifting assembly 7 and a second arm 19 coupled with the seat 4 at a zone opposite to the user's support area.

[0060] The first arm 18 preferably comprises a leverage 20, configured so as to allow the transmission of a lifting and lowering motion, i.e. a translation motion, of the seat 4 in the same vertical direction. To this purpose, the leverage 20 is preferably of the articulated parallelogram type.

[0061] More specifically, the leverage 20 comprises a first lever 21 and a second lever 22 arranged parallel and hinged, at one end, to a fixed structure 2a integral with the base 2, for example a panelling comprising a pair of parallel brackets. In particular, the first lever 21 and the second lever 22 are articulated to the structure 2a at a first fulcrum 23 and at a second fulcrum 24, respectively. At the opposite side, the same levers 21, 22 are articulated to the second arm 19 at a third fulcrum 25 and at a fourth fulcrum 26, respectively (see Figures 3 and 4).

[0062] It should be noted that the first fulcrum 23 and the second fulcrum 24 are aligned in a preferably vertical direction. Furthermore, on the opposite side of the leverage 20, the third fulcrum 25 and the fourth fulcrum 26 are also aligned in a direction parallel to the alignment direction of the first fulcrum 23 and of the second fulcrum 24, so as to actually create an articulated parallelogram.

[0063] In the illustrated case, the first lever 21 is made up of a pair of integral rods (see Figure 4), but further shapes may be provided.

[0064] The second lever 22 is advantageously made up of a box-shaped member 27, made in such a manner so as to have high strength against bending and, for example, of metal sheet. The box shape thus contributes

allowing wide possible excursions of the articulated system described.

[0065] The leverage 20 is articulated to one end of the sliding rod 11 at an articulation pin 28, parallel to the axes of said fulcrums 23, 24, 25, 26 of the articulated parallelogram.

[0066] In this way, extracting the sliding rod 11 from the casing 12 causes the rotation of the leverage 20 and thus of the first lever 21 and of the second lever 22, which maintain the parallel arrangement around the respective fulcrums 23, 24, 25, 26. These latter, thanks to the articulated parallelogram articulation, constantly maintain the same alignment preferably respectively vertical.

[0067] The second arm 19, by virtue of said articulation to the fulcrums 25, 26, maintains the same orientation during both lifting and lowering steps, correspondingly of extension and folding of the support frame 3.

[0068] The insertion element 32 is preferably arranged, in use, on a horizontal plane so as to keep the seat 4 fixed to it horizontally.

[0069] The second arm 19 may preferably have a curved shape, for greater mechanical resistance to bending stress, as well as for aesthetic reasons.

[0070] The second arm 19, which is visible in use in the area below the chair 1, is preferably made of light metallic material, for example aluminium, by melting, so as to allow a finishing aesthetically pleasing, for example polished. This makes superfluous any additional covering elements of the second arm 19, reducing the number of components of the lifting assembly 7 and, therefore, the production costs. The overall structure is also extremely compact.

[0071] The functioning of the hairdresser chair according to the invention is readily apparent from the foregoing description.

[0072] In a preparation step, the operator can connect the chair 1 to the power supply, which supplies the electric motor member 10, or act on the control panel 16 to activate the battery charging 15, so as to make sure that the chair 1 is ready to use.

[0073] When a user sits on the chair 1, it is possible to operate, by means of the control means 9, the lifting or lowering thereof, by adjusting the height of the seat 4 to the user's height, for his comfortable support, and especially to the height of the operator, so that he can easily perform the treatments required, especially on the user's hair.

[0074] In practice, the operator can easily act on the control means 9, with one foot, for example by orientating the tilting lever around the control pin 9a, positioned behind the same chair, so as to easily adjust the height of the seat 4 to suit his needs.

[0075] More specifically, in the case of lifting, the operator causes, by rotating the control lever associated with the pin 9a, the rotation of the motor shaft 14 of the motor member 10 in one direction, while in the case of the lowering, the operator causes, by rotating the same control lever 9 in the opposite direction, the rotation of

the same motor member 10 in the opposite direction.

[0076] An accurate adjustment is allowed, thanks to the lifting assembly 7 and to the transmission performed by the support frame 3 which, thanks to the specific kinematic chain shaped thereupon, keeps the seat 4 in horizontal position at any height of the lifting or lowering.

[0077] The present invention thus achieves the purpose of providing a lifting support device for a chair, particularly for hairdressers, which is easy to use and allows for an effective adjustment of the height of the seat 4 of the same chair.

[0078] In particular, thanks to presence of the articulated system of the support frame 3, the chair 1, on which the device according to the invention is mounted can be adjusted to a height of a maximum excursion exceeding that allowed by the lifting systems of known type. More specifically, the excursion of the lifting or, in any case, of the displacement, in particular of the sliding, obtainable with the lifting assembly 7 of the device according to the invention, may reach up to about 370 mm, preferably up to 350 mm. This allows to meet a wide variety of needs, in particular up to 95% of the needs associated with height variability of customers.

[0079] Another feature of the chair is that the combination of the lifting assembly 7 with the support frame 3 allows, when in the retractable position corresponding to the maximum folding configuration of the support frame 3, to reach a minimum height, lower than the one allowed by the lifting systems of known type. It is specified that the "height" of the chair is considered to be the distance between the connection portion of the frame 3 with the seat 4 and the floor, in particular between the support portion integral with the insertion element 32 and the floor on which the chair is installed. By way of example, a minimum height value reached by the chair is about 345 mm.

[0080] The chair therefore allows for a wide range of heights starting from a minimum height, at the maximum folding configuration, which is reduced compared to the known chairs, with a benefit in terms of meeting the needs related to the variability of customer height and operators involved in the treatments.

[0081] Moreover, thanks to the presence of the lifting assembly 7, with exclusively electric drive, the installation of the chair 1 is very simple.

[0082] The chair 1 can also be moved easily and perfectly into any beauty salon location, thanks to the battery power supply, located under seat 4. In fact, the chair 1 can advantageously be freed from external power sources, simply by activating the operation with the rechargeable battery 15.

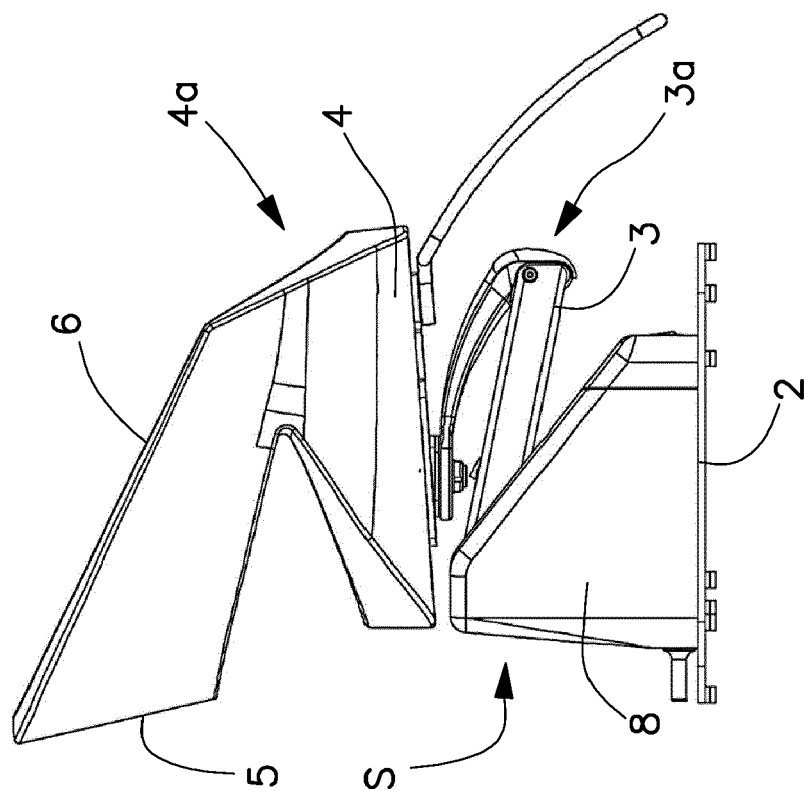
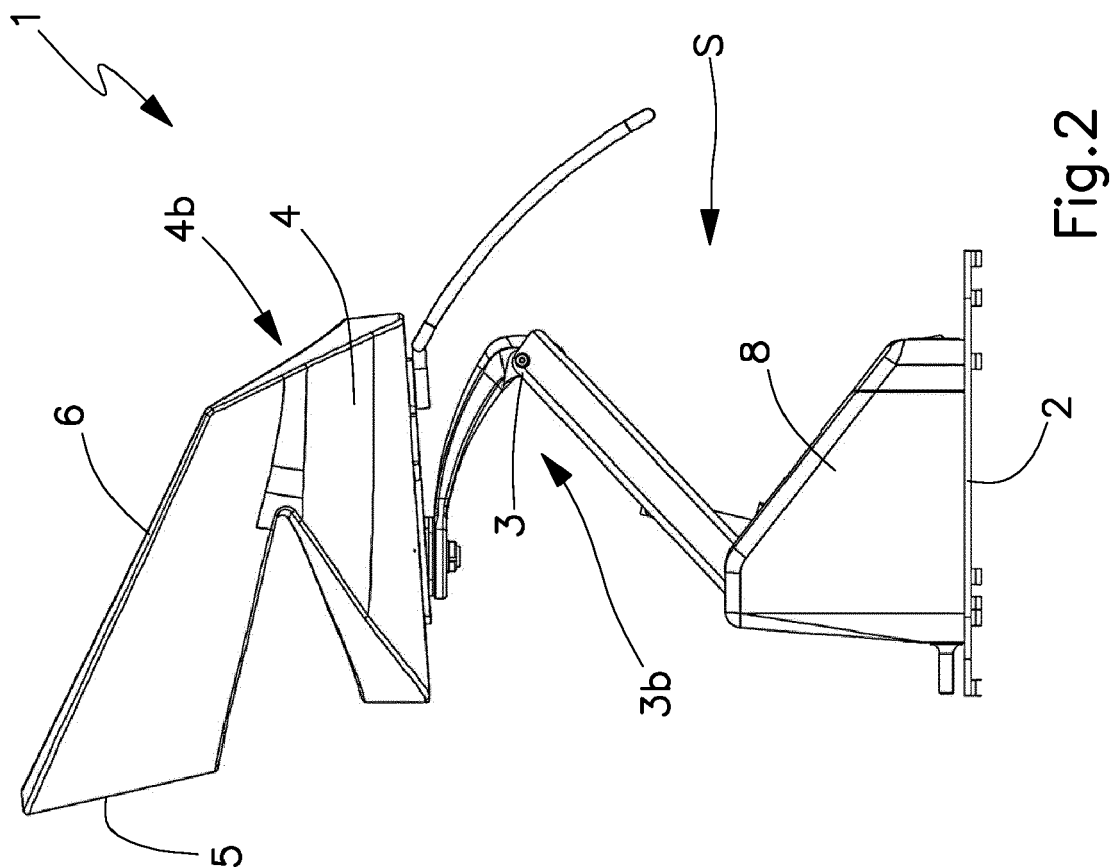
[0083] In practice, the used materials as well as the size and shape may vary according to the needs.

[0084] Should the technical characteristics mentioned in the claims be followed by reference signs, such reference signs were included for the sole purpose of increasing the understanding of the claims and thus they shall not be deemed limiting the scope of the element identified

by such reference signs by way of example.

Claims

1. Lifting support device for a chair, in particular for hairdresser salons, comprising a base (2), a mobile support frame (3) predisposed to be mounted on a seat (4) of said chair (1), a lifting assembly (7) associated with said support frame (3), to perform a height variation of said mobile support frame (3), control means (9) for controlling said variation, said support frame (3) comprising an articulated system provided with at least a first arm (18) and a second arm (19) articulated to each other, said lifting assembly (7) comprising an electric motor member (10) connected to a sliding rod (11), predisposed to operate said sliding rod (11) articulated to one between said first arm (18) and said second arm (19), alternately between a retracted position (11a) corresponding to a configuration of maximum folding (3a) of said support frame (3) and an extracted position (11b) corresponding to a configuration of maximum extension (3b) of said support frame (3) **characterized in that** it comprises a rechargeable battery (15) housed on said base (2) in a housing zone adjacent to said electric motor (10) to supply power to said electric motor (10) and **in that** it comprises a control panel (16) provided with operation means (15b) for recharging said battery (15) and connection means (15a) for connecting to an electrical power source, housed in front of a removable drawer placed on said base (2) so as to permit the inspection of the battery (15) itself.
2. Device according to claim 1, **characterized in that** said battery (15) is removable from said base (2).
3. Device according to claim 1 or 2, **characterized in that** it comprises a control unit (17) housed on said base (2), to control the operation of said motor member (10).
4. Device according to any one of the preceding claims, **characterized in that** said sliding rod (11) is operated by said electric motor (10) through transmission means comprising a gear transmission of the worm gear type.
5. Device according to any one of the preceding claims, **characterized in that** said first arm (18) is articulated to said sliding rod (11), and said second arm (19) can be coupled with said seat (4) from a side opposite to a support side of said seat (4).
6. Device according to claim 5, **characterized in that** said first arm (18) shapes an articulated parallelogram.
7. Hairdresser chair comprising a seat (4) mounted on a lifting support device according to any one of the preceding claims.
8. Hairdresser chair according to claim 7, **characterized in that** said seat (4) is mounted rotatably on said support frame (3) around a substantially vertical axis so as to enable an operator to align correspondingly the user sitting on said seat (4) during the execution of the treatment operations required.
9. Hairdresser chair according to claim 8, **characterized in that** said seat (4) is hinged around a pin (31) inserted into a respective insertion element (32) carried by said support frame (3).
10. Hairdresser chair according to claim 9, **characterized in that** it comprises a series of stop seats (33) obtained at predetermined angular distances on a support portion integral with said insertion element (32).
11. Hairdresser chair according to claim 10, **characterized in that** it comprises stop means, integral with said seat (4), operated by respective elastic means, predisposed to intercept respective stop seats (33) so as to temporarily block the rotation of said seat (4).



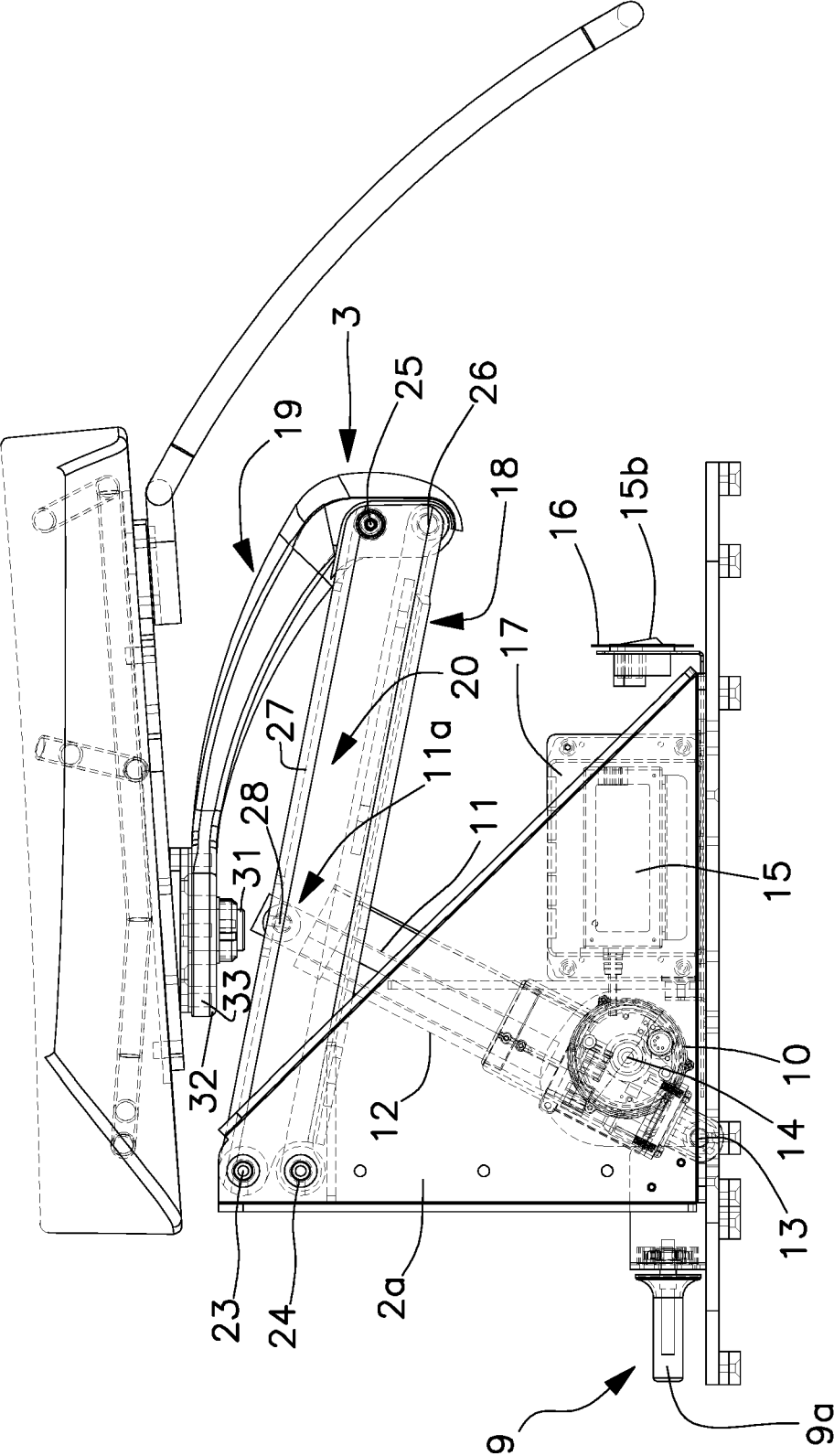


Fig.3

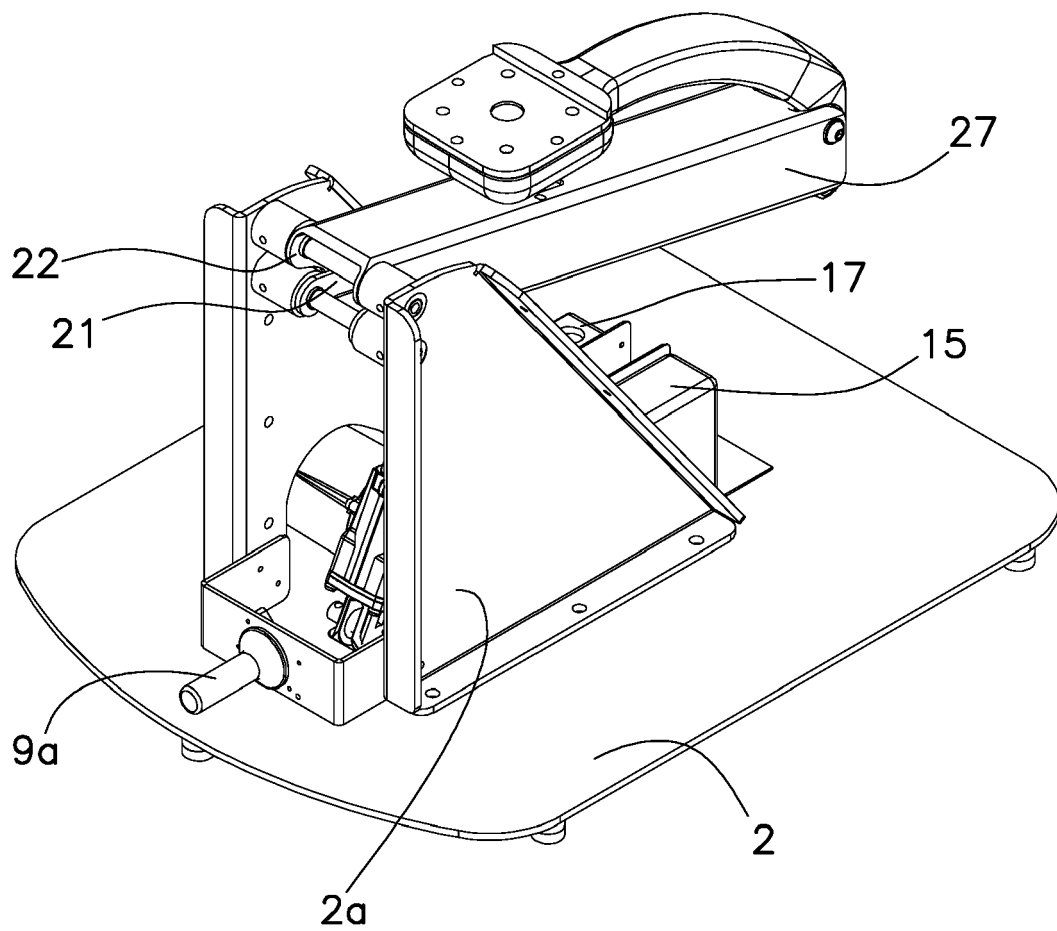


Fig.4

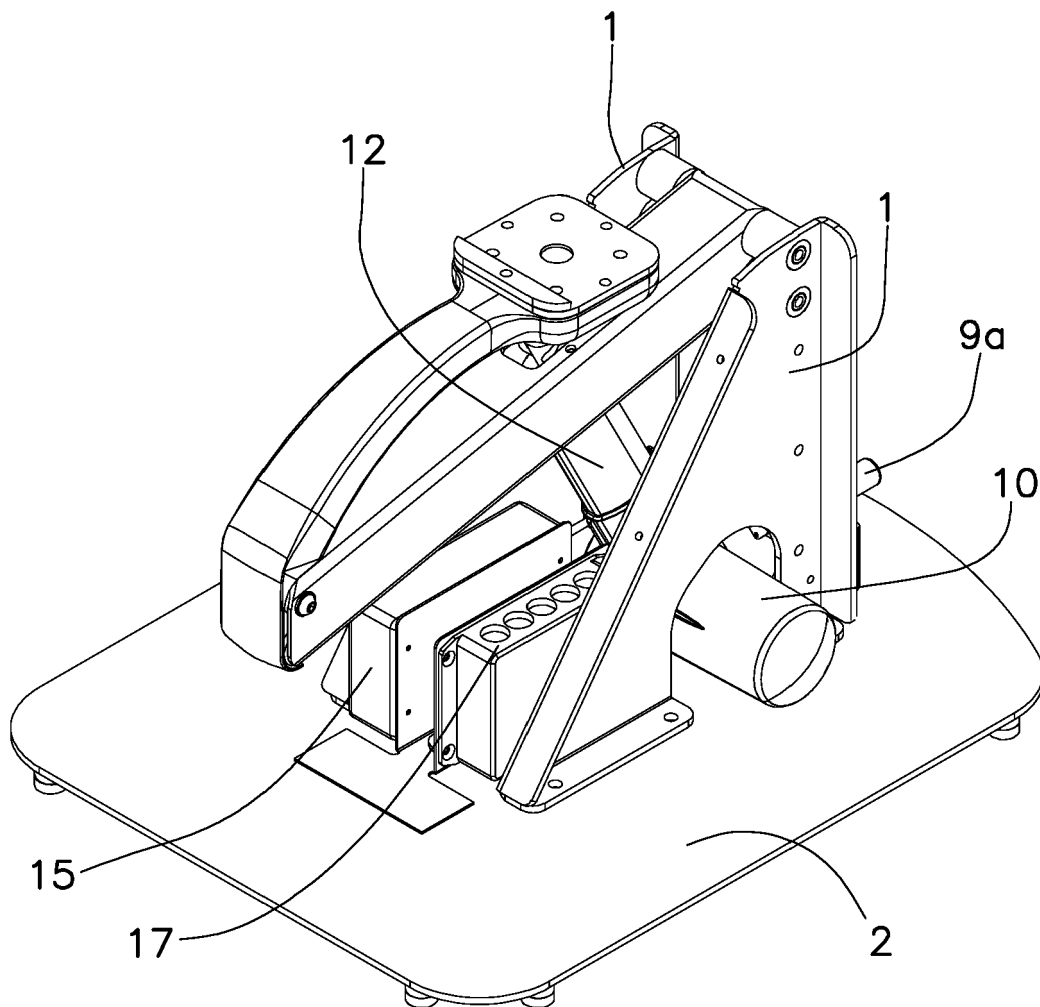
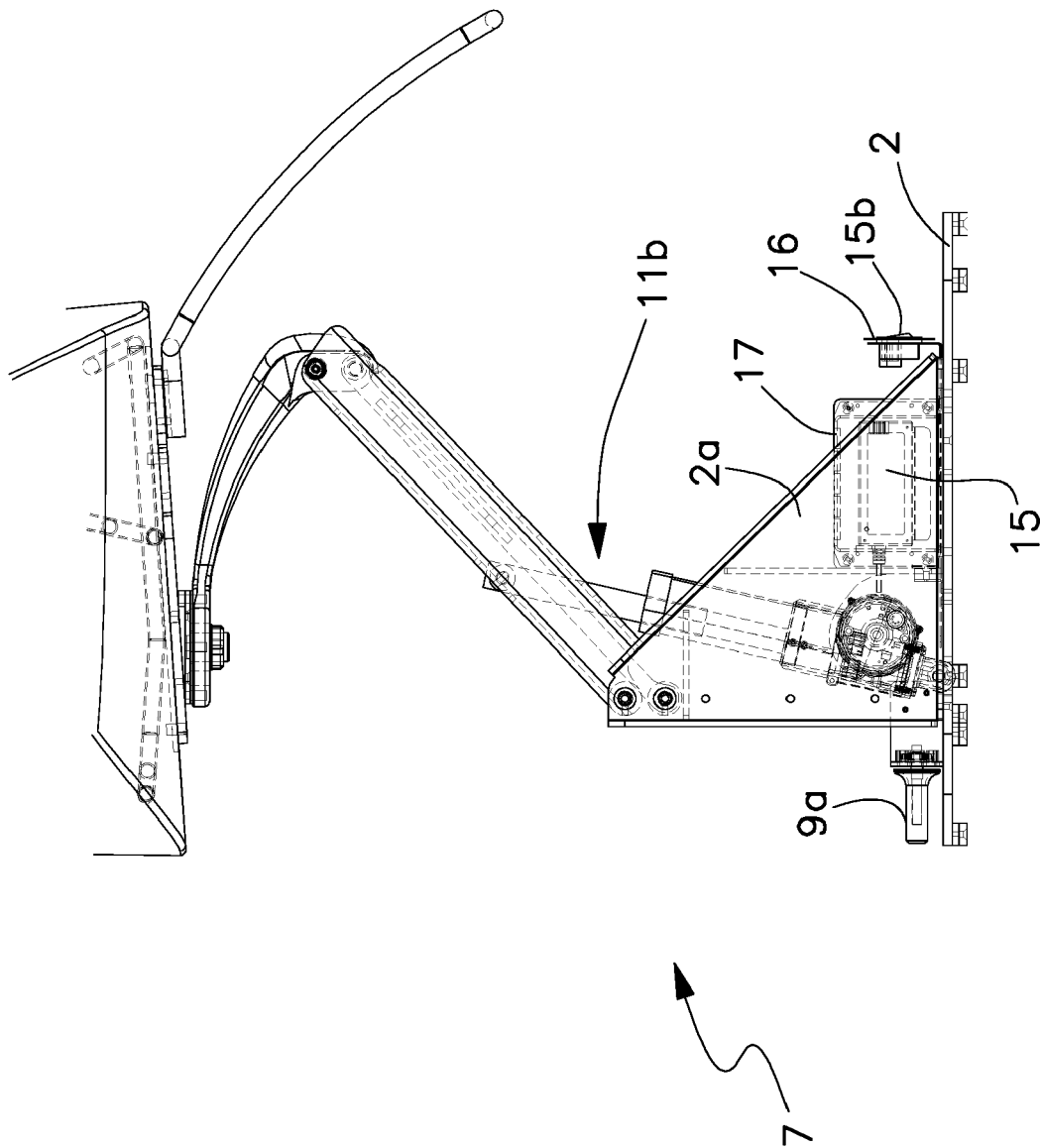
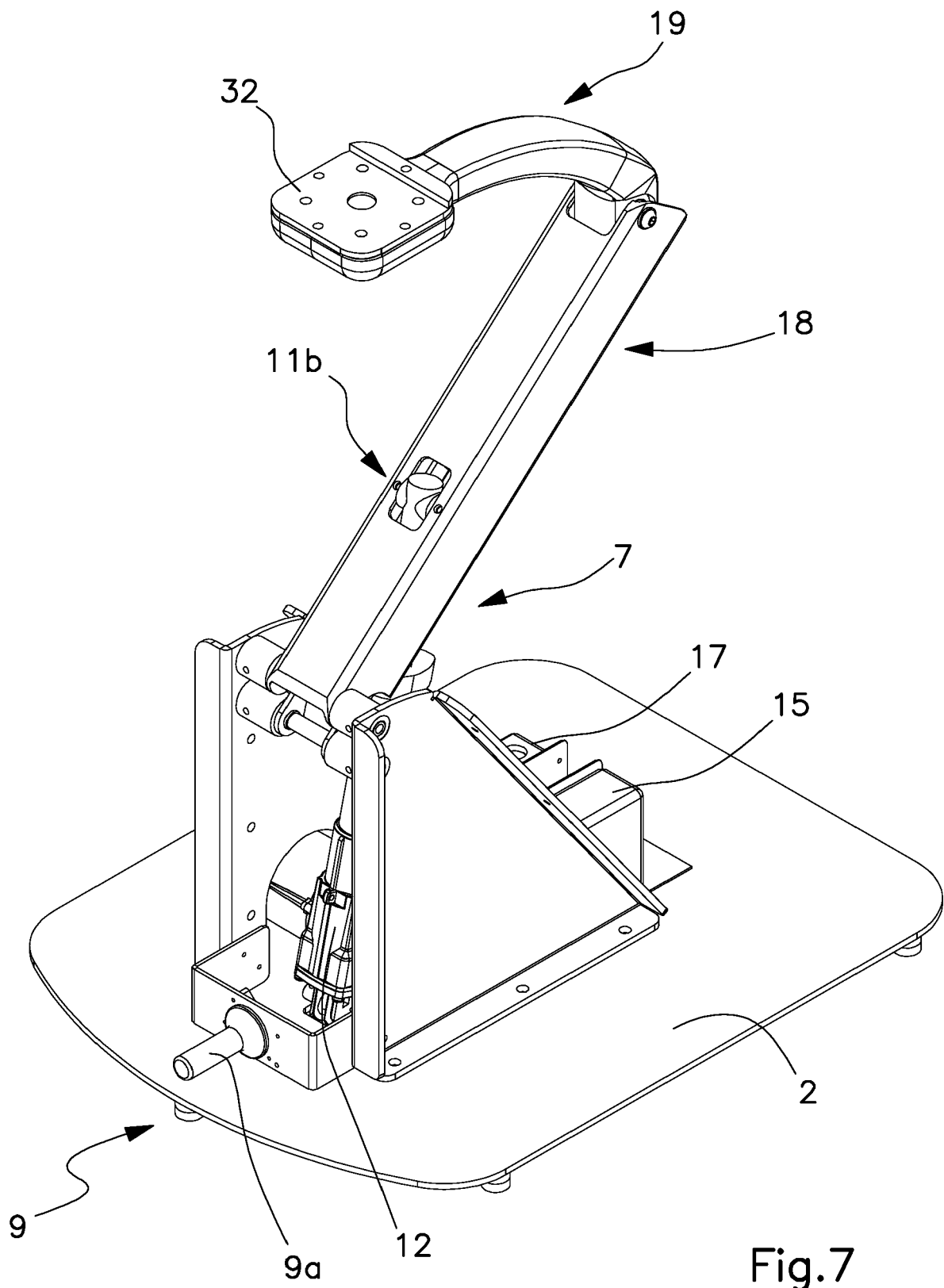


Fig.5

Fig.6





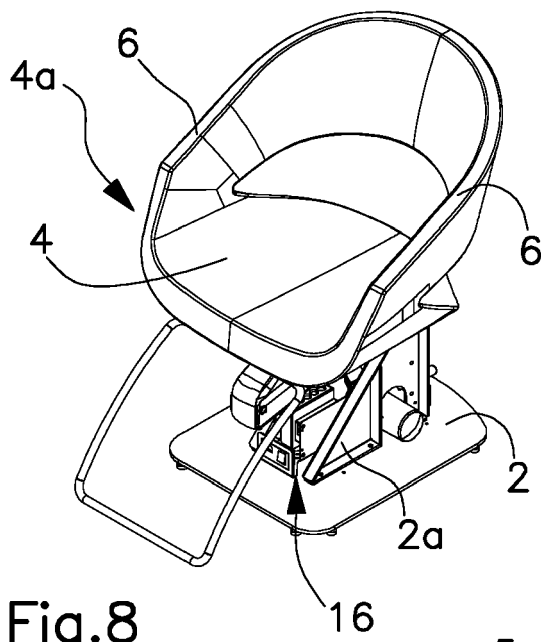


Fig. 8

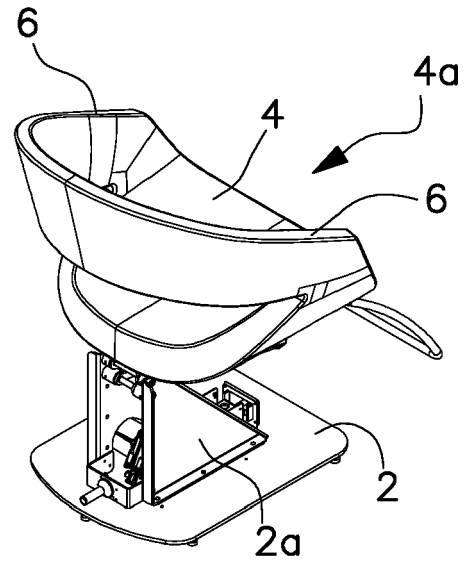


Fig. 9

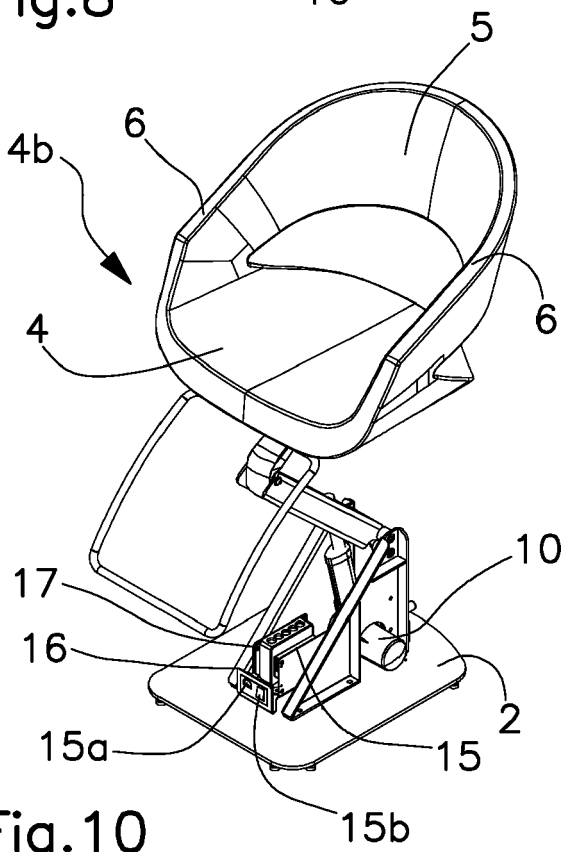


Fig. 10

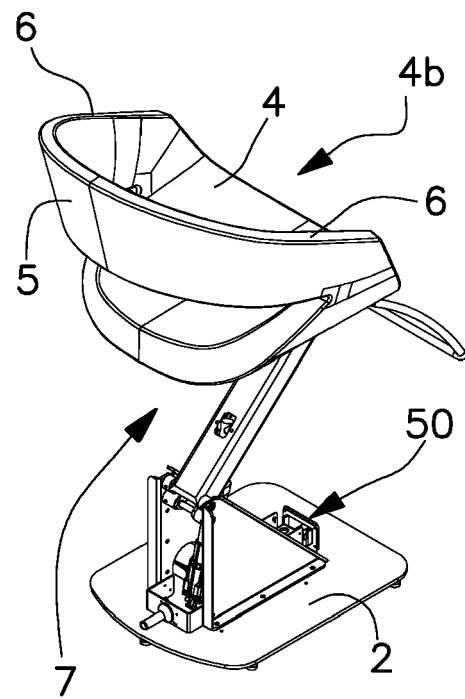


Fig. 11



EUROPEAN SEARCH REPORT

Application Number
EP 17 19 0181

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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 3 874 728 A (WEILAND ROLF-JURGEN) 1 April 1975 (1975-04-01) * column 2, line 40 - column 5, line 22; figures 1-7 *	1-11	INV. A47C1/06 A61G15/02
A	DE 10 2008 018654 A1 (ANDREAS LUPOLD HYDROTECHNIK GM [DE]) 15 October 2009 (2009-10-15) * paragraph [0016] - paragraph [0040]; figures 1-8 *	1	
A	CN 201 274 901 Y (XIAMEN SHUNG HUNG BARBER & BEA [CN]) 22 July 2009 (2009-07-22) * the whole document *	1	
A	GB 1 452 940 A (SIEMENS AG) 20 October 1976 (1976-10-20) * page 1, line 35 - page 3, line 67; figures 1-5 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C A61G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 December 2017	Examiner Lehe, Jörn
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 L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 19 0181

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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25

30

35

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45

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55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3874728 A	01-04-1975	CS 171184 B2	29-10-1976
		DE 2251808 A1	25-04-1974
		FR 2193325 A5	15-02-1974
		GB 1448238 A	02-09-1976
		IT 995995 B	20-11-1975
		JP S629860 Y2	07-03-1987
		JP S4973890 A	17-07-1974
		JP S58160036 U	25-10-1983
		SE 393529 B	16-05-1977
		SU 673145 A3	05-07-1979
		US 3874728 A	01-04-1975
		YU 249973 A	13-11-1981

DE 102008018654 A1	15-10-2009	NONE	

CN 201274901 Y	22-07-2009	NONE	

GB 1452940 A	20-10-1976	GB 1452940 A	20-10-1976
		IT 1003185 B	10-06-1976
