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

(11) **EP 3 603 600 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
19.05.2021 Bulletin 2021/20

(21) Application number: **18777057.3**

(22) Date of filing: **27.03.2018**

(51) Int Cl.:
A61H 1/02 *(2006.01)* ***A63B 23/08*** *(2006.01)*
A61H 1/00 *(2006.01)*

(86) International application number:
PCT/ES2018/070254

(87) International publication number:
WO 2018/178470 (04.10.2018 Gazette 2018/40)

(54) APPARATUS FOR EXERCISING THE LOWER LIMBS OF THE HUMAN BODY

VORRICHTUNG ZUM TRAINIEREN DER UNTEREN GLIEDMASSEN DES MENSCHLICHEN KÖRPERS

APPAREIL D'EXERCICE POUR LES EXTRÉMITÉS INFÉRIEURES DU CORPS HUMAIN

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **29.03.2017 ES 201700308**

(43) Date of publication of application:
05.02.2020 Bulletin 2020/06

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Description

OBJECT OF THE INVENTION

[0001] The present invention, as expressed in the title of the present specification, relates to an apparatus for exercising the lower limbs of the human body, with the object of reactivating and improving blood circulation, improving the cardiovascular system and, in general, the health of the user.

[0002] The apparatus is especially applicable for elderly people and sick people who have impaired motor capacity in their lower limbs, as well as people who are confined to beds, since the apparatus can be adapted to a chair or hospital bed.

TECHNICAL PROBLEM TO BE RESOLVED AND BACKGROUND OF THE INVENTION

[0003] As is known, physical exercise is fundamental for maintaining a good state of health, such that although certain work activities entail the necessary practice of physical exercise, there are still more and more people who must stay seated at their workplace, during practically the entirety of the workday, performing a job that is exclusively intellectual, with practically no physical exercise, especially in their lower limbs.

[0004] This lack of physical exercise negatively affects the health of the person over time, producing situations of discomfort, tiredness, back, neck, leg pain, etc.

[0005] These situations can be resolved by performing physical exercise outside of the work day, such that certain people dedicate time every day, as is advisable, to walking, running, practising certain sports which require daily training or going to the gym, while other people perform physical exercise, basically, on free days when they have more free time and, finally, many people, due to a lack of time or motivation, do not perform any physical exercise.

[0006] Furthermore, we can indicate that, with the practice of the simple exercise of walking being one of the most recommended, those that practice it are very few. Alternatively, many people regularly attend a gym in order to perform very intense exercise by means of the use of different specific apparatuses focused on strengthening the body and the limbs, both upper and lower.

[0007] In any case, during the work day, the lack of specific means which enable the use thereof, not to improve, but rather to maintain the physical state, are focused on passive means, such as static footrests on which the feet are allowed to rest in order to adopt a more comfortable and correct position. One element existing in the market, although not very common, consists of dynamic footrests, which enable the feet to rest and transmit a movement to them.

[0008] Thus, we can cite patent documents ES2178590, EP1350500 of the same holder as the present invention, which describe a footrest for exercising the legs while a user is in a seated position and which is essentially based on a pair of supports for the feet to rest on and to which a reciprocating movement is transmitted. This invention, however, due to the configuration and structure thereof, although very useful, produces certain noises and vibrations which are very annoying for the user and their surroundings. Even more so, when the user is at the workplace, which makes the use thereof not very suitable.

DESCRIPTION OF THE INVENTION

[0009] With the aim of reaching the objectives and preventing the aforementioned drawbacks, the present invention describes an apparatus for exercising the lower limbs of the human body which, from a motor unit, transmits a reciprocating movement to a pair of supports on which rest the feet of a user. The apparatus comprises a greased closed compartment which houses the motor unit, seated on a rubber seat plate secured to the base of the apparatus, the drive shaft of which is defined by a worm that meshes with a gear wheel. In turn, the gear wheel is joined eccentrically to one end of a first rod which, on the other end is joined, so as to rotate, at one end of a second rod. In turn, on the other end, it is securely joined to one end of a third rod which, on the other end, is joined to one end of a fourth rod which, on the other end is secured to one of the arms of a pair which, so as to rotate about a central shaft, are secured by securing shafts, located at the ends, to respective supports on which rest the feet of the user.

[0010] Each of the supports has a first hub which houses the central shaft with the interposition of a pair of first radial bearings and which is seated on a first axial bearing which is, in turn, seated on a first radial projection located in the vicinity of one end of the central shaft. This end of the central shaft is extended with a threaded segment which crosses through a seat and is secured by means of a nut, the seat being secured to the base of the apparatus.

[0011] In the same manner, each end of each arm has a second hub which houses a securing shaft with the interposition of a second radial bearing and which is seated on a second axial bearing which is seated on the upper base of a second radial projection of the securing shaft. This second radial projection, by the lower base thereof, is seated on the very arm, while the securing shaft is extended, crossing through the arm, in a threaded segment which is secured by means of a nut.

[0012] The second hubs of the pair of arms and the first hubs of the pair of supports have an internal setback whereon respective retaining washers are seated together with elastic rings, securing the securing shafts and the central shafts.

[0013] The supports on which rest the feet of the user have a perimeter projection whereon an accessory element can be coupled configured with a general layout

similar to that of the support and provided with an L-shaped projection on the perimeter defining a female mortise for fitting the perimeter protrusion of the supports. In the external base thereof and in the vicinity of one of the smaller sides, it is equipped with a curved protrusion on which rest the feet of the user. On both larger sides it has a pair of slitted orthogonal projections facing each other in pairs for the incorporation of a strip of Velcro® therethrough for the grip of the feet of the user.

[0014] The apparatus, in the external resting base thereof can have a first pair of secured blocks and a second pair of adjustable blocks, such that, if the user uses footwear with heels, they are in a more comfortable position.

BRIEF DESCRIPTION OF THE FIGURES

[0015] To complete the description of the invention, and for the purpose of helping to make the characteristics thereof more readily understandable, according to a preferred exemplary embodiment thereof, a set of drawings is included where, by way of illustration and not limitation, the following figures have been represented:

- Figure 1 shows a plan view of the apparatus for exercising of the invention wherein the upper cover has been removed in order to display the elements that comprise it.
- Figure 2 shows a view of the motor unit and the different rods responsible for the transmission of the movement to the supports on which rest the feet of the user.
- Figure 3 shows a side view of the apparatus for exercising wherein the side cover has been removed in order to display the elements that comprise it.
- Figure 4 shows an enlarged view of the mechanism marked in Figure 3.
- Figure 5 shows a plan view of an accessory element for placement on each of the resting supports in order to place the feet of a user.
- Figure 6 shows a side view of the apparatus for exercising adapted to an chair.
- Figure 7 shows an enlargement of the apparatus for exercising adapted to the chair shown in Figure 6.
- Figure 8 shows a side view of the apparatus for exercising with an inclination mechanism.

[0016] A list of the references used in the figures is provided below:

1. Motor unit.
2. Seat plate
3. Worm.
4. Gear wheel.
5. First rod.
6. Second rod.
7. Third rod.
8. Fourth rod.
9. Arms.
10. Supports.
11. Securing shafts.
12. Central shafts.
13. First hub.
14. First radial bearing.
15. First axial bearing.
16. First radial projection.
17. First elastic ring.
18. First retaining washer.
19. Seat.
20. Base of the apparatus.
21. Second hubs.
22. Second radial bearing.
23. Second axial bearing.
24. Second radial projection.
25. Second elastic ring.
26. Second retaining washer.
27. Protrusion.
28. Accessory element.
29. Projection.
30. Curved protrusion.
31. First flange.
32. Second flange.
33. Skirt.
34. Secured blocks.
35. Adjustable blocks.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0017] Considering the numbering adopted in the figures and, as shown in Figure 1, the apparatus for exercising of the invention comprises a closed compartment which houses a motor unit (1) the base of which is seated on a seat plate (2) preferably made of rubber, with the object of absorbing the vibrations and noises that it produces when in movement, elements which are annoying both for the user of the apparatus and for the people in their surroundings. The rubber seat plate (2) is secured by means of screws to the base of the motor unit (1) and the base of the apparatus (20).

[0018] Thus, as shown in Figure 1 and more clearly in Figure 2, the closed compartment houses the drive shaft of the motor, defined by a worm (3) that meshes with a gear wheel (4). From an eccentric point of the gear wheel (4) four rods (5, 6, 7, 8) are joined consecutively by the ends thereof, as shown in Figure 2. The first rod (5) is articulated to the wheel (4) and to the second rod (6). The second rod (6) is integrally joined to the third rod (7) and both are able to rotate around a secured pin that joins it. Thus, the rotating movement of the wheel (4) is converted into an angular reciprocating movement in the third rod (7). The fourth rod (8) is articulated to the third rod (7) by one of the ends thereof.

[0019] The closed compartment incorporates grease immersing the worm drive shaft (3), the gear wheel (4) meshed with it, the first rod (5), the second rod (6) and

the shaft that joins it to the third rod (7), which enables the noise that could be produced to be reduced as much as possible, enables better operations of the motor unit (1) and prevents the accumulation of dirt.

[0020] As shown in Figure 3, the apparatus also comprises two parallel supports (10) on which rest the feet of the user which are each joined to the ends of a pair of parallel arms (9) by means of respective securing shafts (11) which are able to rotate. The arms (9) are secured by respective central shafts (12) to the casing of the apparatus, such that they are able to rotate.

[0021] As seen in Figure 1, the movement of the supports (10) is performed by means of the joining of the fourth rod (8), by the free end thereof, to one of the arms (9) by an area close to one of the ends thereof.

[0022] Thus, when the motor activates the rotation of the worm drive shaft (3), it causes the rotation of the gear wheel (4) and, with it, the movement of the rods (5, 6) which cause the reciprocating rotation, according to the shown angle X-X, of the third rod (7). The angular reciprocating movement of the third rod (7) is converted into an alternating movement of the fourth rod (8) which, through the arms (9), is converted into an alternating movement of the supports (10) which makes it so that, due to the securing of the central shafts (12), while one of the supports (10) moves in one direction, the other support moves in the opposite direction.

[0023] The securing of the ends of the arms (9) in the supports (10) produces friction when it moves which is normally accompanied by noise. One of the objects of the present invention is to prevent these noises.

[0024] To do so, as shown in Figure 3 and more clearly in the enlargement of Figure 4, the arms (9) incorporate a first hub (13) which houses a pair of first radial bearings (14) which fit into the central shaft (12), passing through the first hub (13). In turn, the first hub (13) is seated on a first axial bearing (15) which is arranged on a first radial projection (16) incorporated by the central shaft (12). This, in turn, rests on a seat (17) which is secured to the internal base (20) of the apparatus by means of screws.

[0025] The end of the central shaft (12) which is close to the radial projection (16) is threaded and crosses through the seat (19) in order to be secured by means of a nut which is housed in a gap made in the seat (19) for this purpose.

[0026] The central shaft (12) is secured to the arm (9), by the opposite end thereof, by having a first elastic ring (17) and a first retaining washer (18).

[0027] Moreover, the joining of the arms (9) to the resting supports (10) is made by means of second hubs (21). Each of the second hubs (21) houses a second radial bearing (22) wherein a securing shaft (11) fits and is seated on a second axial bearing (23) which is arranged on a second radial projection (24) incorporated by the securing shaft (11) with the object of supporting the weight of the legs of the user and reducing the consumption of the motor, as well as reducing noise.

[0028] According to Figure 4, it can be seen how the mentioned securing shafts (11) are coupled to the ends of the pair of arms (9) and are anchored by respective nuts, while on the other end the cited securing shafts (11) incorporate second elastic rings (25) which through second retaining washers (26) are secured to supports (10) on which rest the feet of the user. In this figure it is seen how the retaining washers (26) are seated on a small setback had by the second hubs (21), just like the first hub (13).

[0029] As seen in Figure 3, the supports (10) on which rest the feet of the user have in the upper base and on the perimeter a small protrusion (27), such that when the apparatus is going to be adapted to a reclining chair, as seen in Figure 6, or to a hospital bed, an accessory element (28) will be placed which is based on a platform with dimensions similar to the supports (10) and equipped with an L-shaped perimeter projection (29) defining a female mortise which will receive the protrusion (27), as seen in Figure 7, being secured and able to be disassembled.

[0030] Likewise, as shown in Figure 5, the cited accessory element (28) has on the external face thereof and in the vicinity of one of the smaller sides a curved protrusion (30) wherein the user, when they are in a lying position, will be able to place their heel to rest the foot and, with a strip with Velcro® or similar, secure the foot of the user, which represents a significant advantage. To do so, the accessory element (28) has on both larger sides, at least, one slitted projection, in an orthogonal position, which, in one preferred embodiment, are present in pairs facing each other through which respective strips of Velcro® will pass with the object of tying down the feet of the user.

[0031] The adaptation of the apparatus for exercising to a reclining chair is performed by means of a right-angled structure, such that by a first flange (31) it is secured to the skirt (33) of the reclining chair and by a second flange (32) the apparatus for exercising is assembled, as shown in Figures 6 and 7, it being able to be seen how the right-angled structure has a mechanism which enables the tilting of both flanges (31, 32) between each other in order to adapt it to the needs of the user.

[0032] In Figure 7, the apparatus for exercising is seen in detail with the right-angled structure for adaptation to be assembled in a reclining chair or a hospital bed, the motorised tilting mechanism being shown between the conventional flanges (31, 32). Likewise, we can see how the apparatus for exercising has incorporated the accessory element (28) in the supports (10).

[0033] Moreover, the resting base of the apparatus for exercising has a pair of secured blocks (34) arranged on the side closest to the user when in use and a pair of adjustable blocks (35) which, for example, can be threaded screws, located on the opposite side farthest from the user such that if the user uses footwear with heels they can adjust the inclination of the apparatus making the use thereof more comfortable. This is shown in Figure 8, wherein the curved protrusion has been removed for

greater clarity. The two adjustable blocks (35) can be based on threaded screws. The secured blocks (34) and the adjustable blocks (35) are preferably antislip.

[0034] Figure 6 shows a real application of the invention where the apparatus for exercising the lower limbs object of the invention has been adapted to a reclined chair that has a tilting back and a skirt (33). The back of the chair further incorporates at least on one of the sides, although preferably on both sides, an apparatus for exercising the upper limbs which is protected by document ES2499815 of the same holder as the present invention.

[0035] Finally, it must be taken into account that the present invention must not be limited by the embodiment herein described. Other arrangements may be carried out by those skilled in the art based on the present description. Accordingly, the scope of the invention is defined by the following claims.

Claims

1. An apparatus for exercising the lower limbs of the human body, wherein a reciprocating movement is transmitted from a motor unit (1) to a pair of supports (10) on which the feet of a user rest, wherein the apparatus comprises:

   - a closed compartment incorporating grease which houses the motor unit (1), seated on a rubber seat plate (2) secured to the base of the apparatus (20), a drive shaft of which is defined by a worm gear (3) that engages with a gear wheel (4) which is joined eccentrically by means of a shaft to one end of a first rod (5) which, on the other end is joined, able to rotate, at one end of a second rod (6) which, in turn, on the other end, is securely joined to one end of a third rod (7) which, on the other end, is joined to one end of a fourth rod (8) which, on the other end is secured to an arm (9) from a pair of arms (9) able to rotate about a central shaft (12) and both arms (9) of the pair being secured by securing shafts (11), which are located at the ends, to respective supports (10)
   wherein,
   - each of the supports (10) has a first hub (13) which houses the central shaft (12) with the interposition of a pair of first radial bearings (14) and which is seated on a first axial bearing (15) seated on a first radial projection (16) located in one end of the central shaft (12), end which is extended with a threaded segment which crosses through a seat (19) and is secured by means of a nut, the seat (19) being secured to the base of the apparatus (20);
   - each end of each arm (9) has a second hub (21) which houses a securing shaft (11) with the interposition of a second radial bearing (22) and which is seated on a second axial bearing (23) seated on the upper base of a second radial projection (24) of the securing shaft (11) which lower base is seated on the corresponding arm (9) and the securing shaft (11) is extended crossing through the arm (9) in a threaded segment and is secured by an additional nut;
   wherein,
   - the second hubs (21) of the pair of arms (9) and the first hubs (13) of the pair of supports (10) have an internal setback whereon respective retaining washers (18, 26) are seated together with elastic rings (17, 25), securing the securing shafts (11) and the central shafts (12).

2. The apparatus for exercising the lower limbs of the human body, according to claim 1, **characterised in that** the supports (10) have a perimeter protrusion (27) and the apparatus comprises an accessory element (28) configured with a general layout similar to that of the support (10) and provided with an L-shaped projection (29) on the perimeter defining a female mortise for fitting the perimeter protrusion (27) of the support (10) and so be able to couple the accessory element (28) to the apparatus while, in the external base thereof, the accessory element (28) is equipped with a curved protrusion (30) in one of the smaller sides and on both larger sides it has a pair of slitted orthogonal projections facing each other in pairs.

3. The apparatus for exercising the lower limbs of the human body, according to claim 1, **characterised in that** the apparatus, in the external resting base thereof, has a pair of secured blocks (34) and a second pair of adjustable blocks (35).

4. The apparatus for exercising the lower limbs of the human body, according to claim 1 or 2, **characterised in that** it has a strip of mechanical adhesive with hooks and loops passing through the slits of the orthogonal projections facing each other on both sides of the accessory element. (28).

Patentansprüche

1. Vorrichtung zum Trainieren der unteren Extremitäten des menschlichen Körpers, wobei eine Pendelbewegung von einer Motoreinheit (1) auf ein Paar von Trägern (10) übertragen wird, auf denen die Füße eines Benutzers ruhen, wobei die Vorrichtung umfasst:

   - ein geschlossenes Fach zur Aufnahme von Fett, das die Motoreinheit (1) aufnimmt, sitzend auf einer Gummiaufnahmeplatte (2), fixiert an der Basis der Vorrichtung (20), deren Antriebs-

welle durch ein Schneckenrad (3) definiert ist, das in Eingriff mit einem Zahnrad (4) steht, das exzentrisch durch eine Welle mit einem Ende einer ersten Stange (5) verbunden ist, die am anderen Ende drehbar mit einem Ende einer zweiten Stange (6) verbunden ist, die wiederum am anderen Ende fest mit einem Ende einer dritten Stange (7) verbunden ist, die am anderen Ende mit einem Ende einer vierten Stange (8) verbunden ist, die am anderen an einem Arm (9) von einem um eine Mittelwelle (12) drehbaren Paar von Armen (9) fixiert ist, wobei beide Arme (9) des Paares durch Fixierwellen (11), die an den Enden angeordnet sind, an jeweiligen Trägern (10) fixiert sind,
wobei
- jeder der Träger (10) eine erste Nabe (13) aufweist, welche die Mittelwelle (12) mit der Einfügung eines Paares von ersten Radiallagern (14) aufnimmt und die auf einem ersten Axiallager (15) auf einer ersten radialen Auskragung (16), angeordnet in einem Ende der Mittelwelle (12), sitzt, und die mit einem Gewindesegment verlängert ist, das eine Aufnahme (19) quert und durch eine Mutter fixiert ist, wobei die Aufnahme (19) an der Basis der Vorrichtung (20) fixiert ist;
- jedes Ende von jedem Arm (9) eine zweite Nabe (21) aufweist, die eine Fixierwelle (11) mit der Einfügung eines zweiten Radiallagers (22) aufnimmt und die auf einem zweiten Axiallager (23) auf der oberen Basis einer zweiten radialen Auskragung (24) der Fixierwelle (11) sitzt, deren unteren Basis auf dem entsprechenden Arm (9) sitzt, und die Fixierwelle (11) den Arm (9) in einem Gewindesegment querend verlängert ist und durch eine zusätzliche Mutter fixiert ist;
wobei
- die zweiten Naben (21) des Paares von Armen (9) und die ersten Naben (13) des Paares von Trägern (10) einen internen Rücksprung aufweisen, auf dem jeweilige Haltescheiben (18, 26) zusammen mit elastischen Ringen (17, 25) zum Fixieren der Fixierwellen (11) und der Mittelwellen (12) sitzen.

2. Vorrichtung zum Trainieren der unteren Extremitäten des menschlichen Körpers nach Anspruch 1, **dadurch gekennzeichnet, dass** die Träger (10) einen Umfangsvorsprung (27) aufweisen und die Vorrichtung ein mit einer Gesamtanordnung ähnlich der des Trägers (10) versehenes und mit einem L-förmigen Vorsprung (29) am Umfang zum Definieren eines Hohllochs zum Einsetzen des Umfangvorsprungs (27) des Trägers (10) und somit zum Ermöglichen des Koppelns des Zubehörelements (28) mit der Vorrichtung ausgestattetes Zubehörelement (28) umfasst, wobei in der äußeren Basis von diesem das Zubehörelement (28) mit einem gekrümmten Vorsprung (30) an einer der schmaleren Seiten ausgestattet ist und an beiden breiteren Seiten ein Paar von geschlitzten orthogonalen zueinander in Paaren zeigenden Auskragungen aufweist.

3. Vorrichtung zum Trainieren der unteren Extremitäten des menschlichen Körpers nach Anspruch 1, **dadurch gekennzeichnet, dass** die Vorrichtung in der äußeren Tragebasis ein Paar von feststehenden Blöcken (34) und ein zweites Paar von verstellbaren Blöcken (35) aufweist.

4. Vorrichtung zum Trainieren der unteren Extremitäten des menschlichen Körpers nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** sie einen Streifen von mechanischem Haftmittel mit Haken und Schlaufen aufweist, der durch die Schlitze der zueinander zeigenden orthogonalen Auskragungen an beiden Seiten des Zubehörelements (28) geführt ist.

Revendications

1. Appareil d'exercice pour les membres inférieurs du corps humain, dans lequel un mouvement réciproque est transmis d'une unité de moteur (1) à une paire de supports (10) sur laquelle les pieds d'un utilisateur reposent, dans lequel l'appareil comprend :

- un compartiment fermé qui incorpore de la graisse qui loge l'unité de moteur (1), installé sur une plaque de siège en caoutchouc (2) fixée à la base de l'appareil (20), dont un arbre d'entraînement est défini par un engrenage à vis sans fin (3) qui se met en prise avec une roue dentée (4) qui est assemblée de manière excentrique au moyen d'un arbre à une extrémité d'une première tige (5) qui, sur l'autre extrémité est assemblée, pouvant tourner, au niveau d'une extrémité d'une deuxième tige (6) qui, à son tour, sur l'autre extrémité, est fixement assemblée à une extrémité d'une troisième tige (7) qui, sur l'autre extrémité, est assemblée à une extrémité d'une quatrième tige (8) qui, sur l'autre extrémité, est fixée à un bras (9) d'une paire de bras (9) pouvant tourner autour d'un arbre central (12) et les deux bras (9) de la paire étant fixés par des arbres de fixation (11), qui sont positionnés aux extrémités, sur des supports (10) respectifs,
dans lequel :
- chacun des supports (10) a un premier moyeu (13) qui loge l'arbre central (12) avec l'interposition d'une paire de premiers paliers radiaux (14) et qui est installé sur un premier palier axial (15) installé sur une première saillie radiale (16) positionnée dans une extrémité de l'arbre cen-

tral (12), extrémité qui est étendue avec un segment fileté qui traverse un siège (19) et est fixée au moyen d'un écrou, le siège (19) étant fixé à la base de l'appareil (20) ;
- chaque extrémité de chaque bras (9) a un second moyeu (21) qui loge un arbre de fixation (11) avec l'interposition d'un second palier radial (22) et qui est installé sur un second palier axial (23) installé sur la base supérieure d'une seconde saillie radiale (24) de l'arbre de fixation (11), laquelle base inférieure est installée sur le bras (9) correspondant et l'arbre de fixation (11) est étendu à travers le bras (9) dans un segment fileté et est fixé par un écrou supplémentaire ;
dans lequel :
- les seconds moyeux (21) de la paire de bras (9) et les premiers moyeux (13) de la paire de supports (10) ont un revers interne sur lequel des rondelles de retenue (18, 26) respectives sont installées conjointement avec des bagues élastiques (17, 25), fixant les arbres de fixation (11) et les arbres centraux (12).

2. Appareil d'exercice pour les membres inférieurs du corps humain selon la revendication 1, **caractérisé en ce que** les supports (10) ont une saillie périmétrale (27) et l'appareil comprend un élément accessoire (28) configuré avec un contour général similaire à celui du support (10) et prévu avec une saillie en forme de L (29) sur le périmètre définissant une mortaise femelle pour monter la saillie périmétrale (27) du support (10) et pouvoir coupler l'élément accessoire (28) à l'appareil alors que dans sa base externe, l'élément accessoire (28) est équipé d'une saillie incurvée (30) dans l'un des plus petits côtés et sur les deux plus grands côtés, il a une paire de saillies orthogonales fendues se faisant face par paires.

3. Appareil d'exercice pour les membres inférieurs du corps humain selon la revendication 1, **caractérisé en ce que** l'appareil, dans sa base de repos externe, a une paire de blocs fixés (34) et une seconde paire de blocs ajustables (35).

4. Appareil d'exercice pour les membres inférieurs du corps humain selon la revendication 1 ou 2, **caractérisé en ce qu'**il a une bande d'adhésif mécanique avec des crochets et des boucles passant à travers les fentes des saillies orthogonales se faisant face des deux côtés de l'élément accessoire (28).

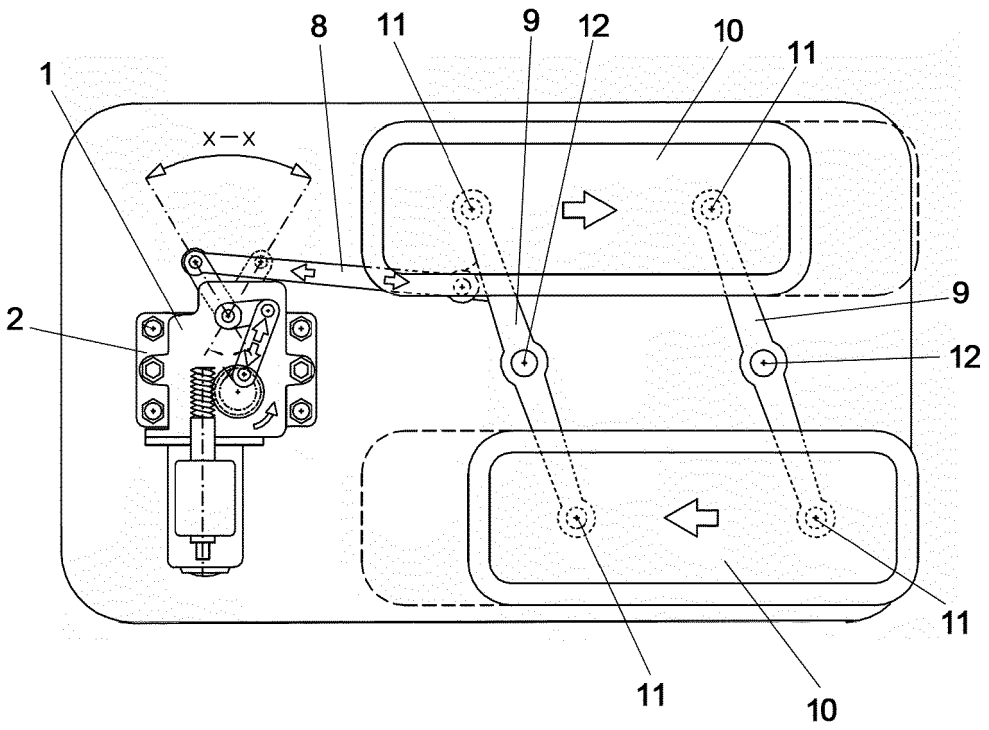

FIG.1

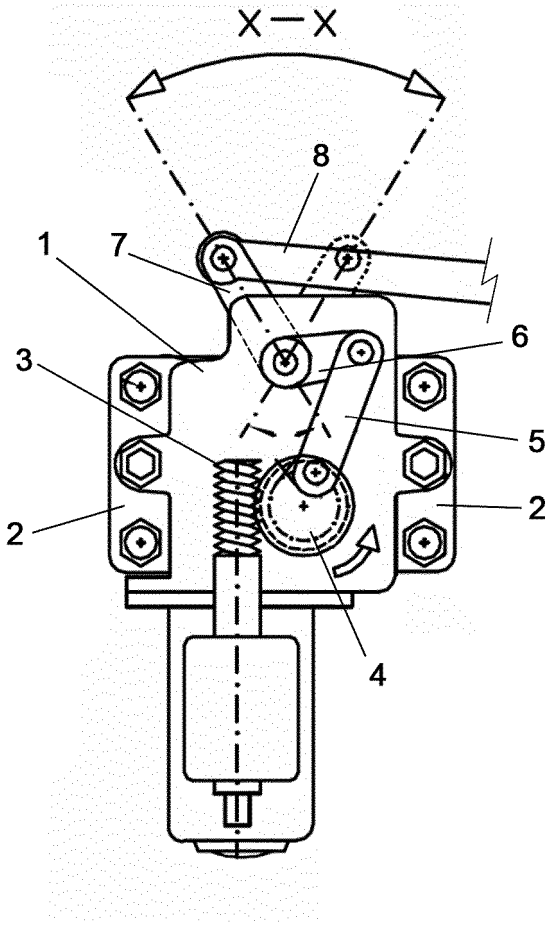

FIG.2

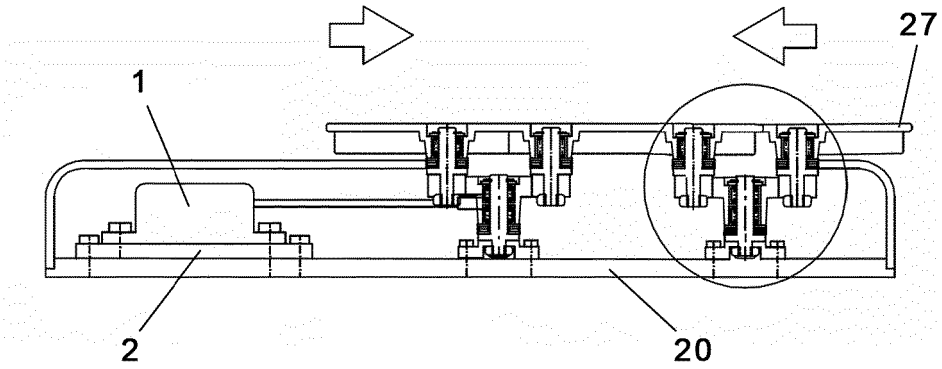

FIG.3

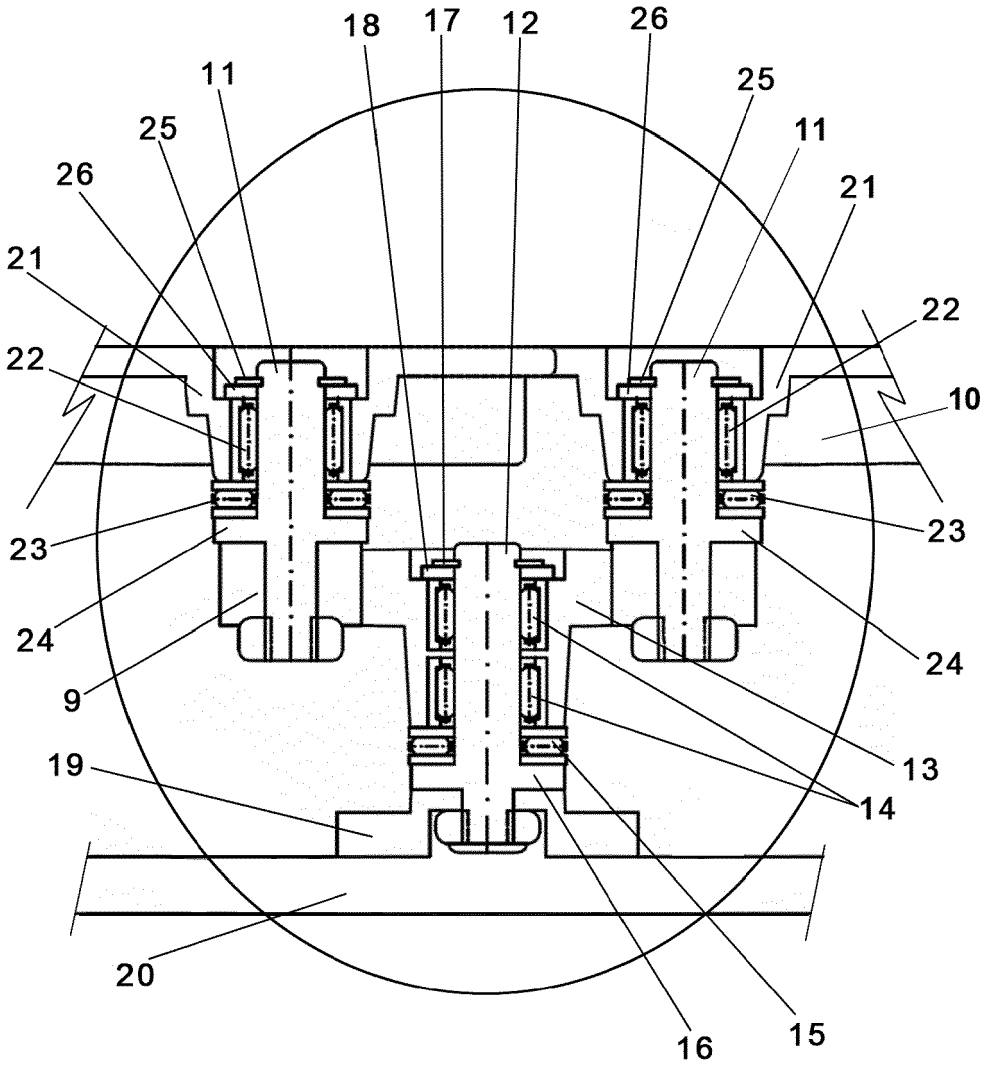

FIG.4

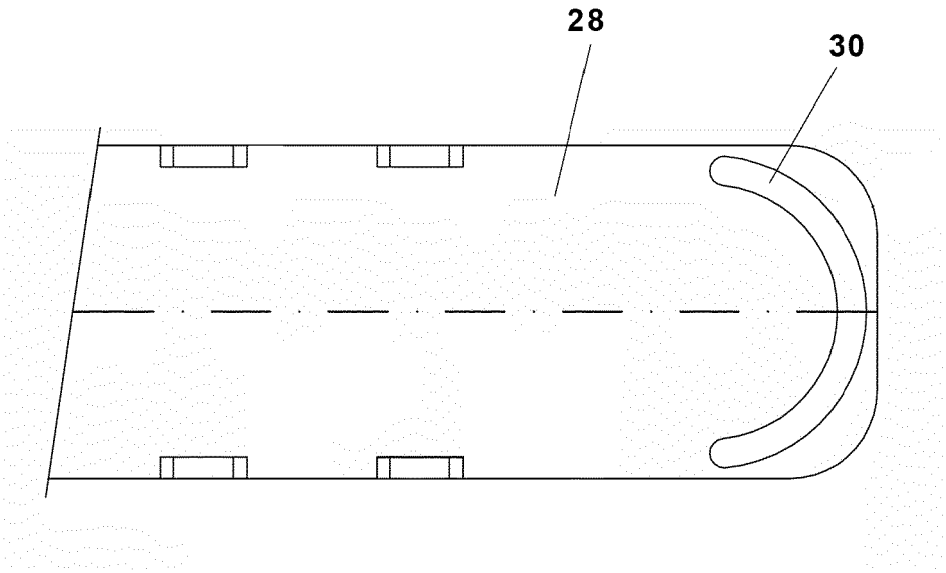

FIG.5

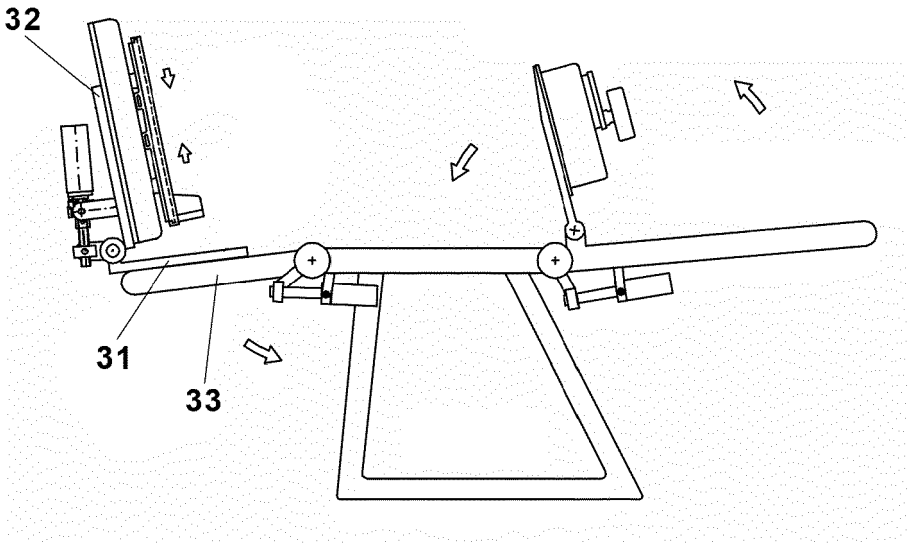

FIG.6

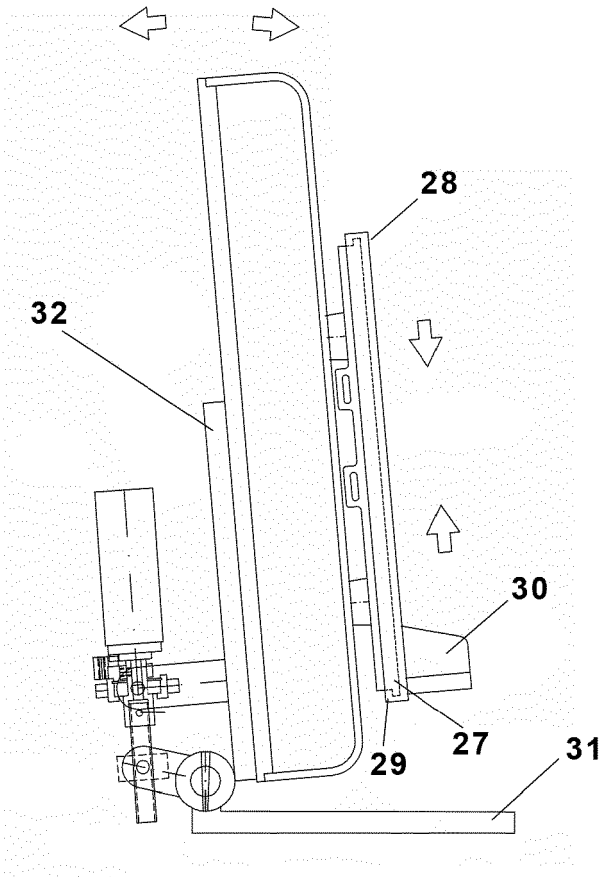

FIG.7

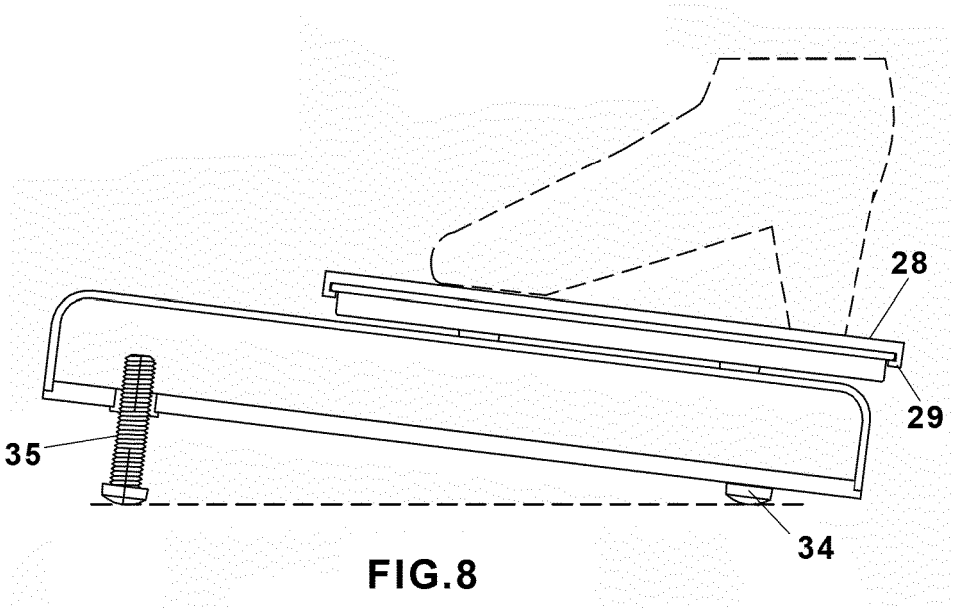

FIG.8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- EP 1350500 A **[0008]**
- ES 2499815 **[0034]**