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(54) Fitness equipment for carrying out exercises involving the muscles and the articulations of the legs

(57) A fitness equipment for carrying out exercises involving the muscles and the articulations of the legs comprising a base (1), a box-type shoe body (2), for housing a user's foot (4) and pivoted to the base (1) in correspondence to its own tip (2b) around a horizontal axis (6). Besides a strap (11) for fastening the foot (4) to the shoe (2), springs (8) are provided between the base (1) and the shoe (2), for hindering the rotation of the shoe (2) around said axis (6) from a substantially vertical non-working position.

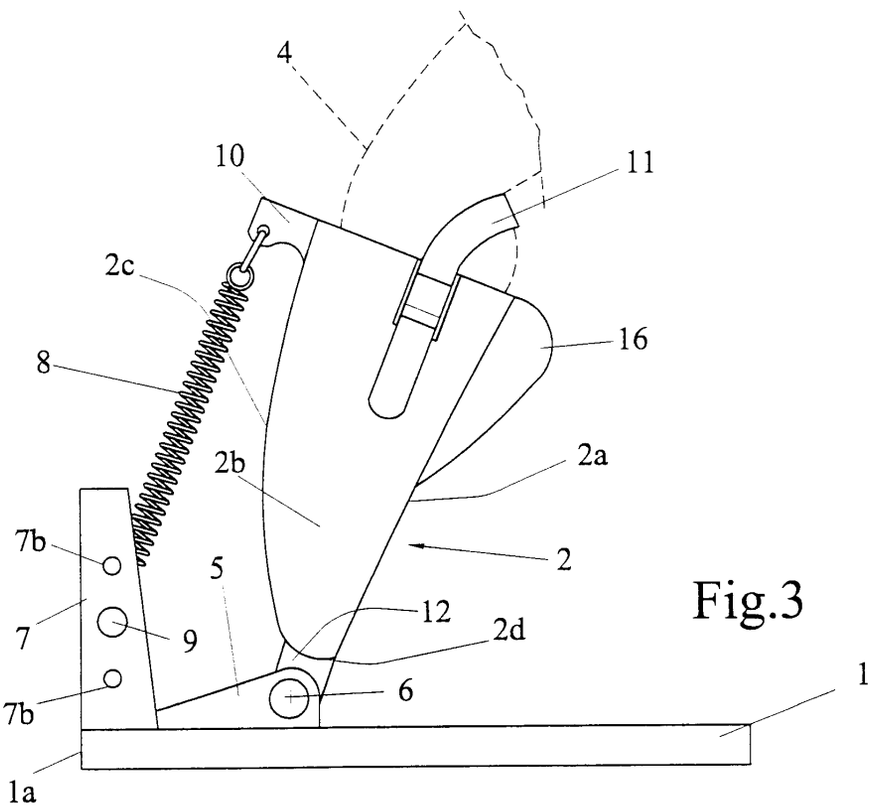

Fig.3

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Description

[0001] The present invention relates to the fitness field. More specifically, it concerns an equipment for carrying out exercises involving the muscles and the articulations of the legs, namely those of the foot and of the ankle.

[0002] The articulations of the foot and of the ankle are man's basic ones and a defective operation thereof can impair the overall balance of the gait and of the posture. As a result, incorrect gait and posture can easily cause aching pathologies of the knee, of the hip joint and of the vertebral column, due to myofascial dysfunctions.

[0003] Furthermore, a better mechanical condition of the ankle makes easier for the body to quickly adapt itself to the position changes, i. e. strengthens the balance capability. In fact, the talocrural articulation, that is to say the ankle, is definitely that which, being directly in contact with the ground, is concerned to a greater extent with the transmission of nerve impulses informing the body about the variations of the ground itself.

[0004] The correct operation and health of the feet and of the ankles are tightly linked with a sufficient degree of strength and mobility of the relevant articulations. The development of said qualities is particularly important in all the sports, and, more generally speaking, in those expressive activities requiring a solid athletic background.

[0005] In such field, only in the latest few years it has been understood that the articular mobility, the muscular elasticity and the balance control are essential in order to achieve top level athletic performances and are as important as the qualities specifically required by the different sports and traditionally trained by the athletes, e. g. strength, power, speed and resistance. The above is true in particular for what concerns the sports and the expressive activities in which a great articular flexibility is required, as hurdle-race, high jump, long jump, swimming, diving, gymnastics, dancing etc..

[0006] The so-called "stretching" exercises are especially important in order to strengthen the articulations of the foot and of the ankle. Through these exercises, a stretching of the articulation supporting muscular structure is achieved, with the purpose of enhancing the elasticity of the muscles and their capability of extending and relaxing, and consequently of increasing the articular mobility. Such exercises have a fundamental importance as for both prevention and rehabilitation are concerned. As a matter of fact, after an injury an athlete has to regain the withdrawals of the muscles and of the sinews due to the damage he has suffered and to the consequent inactivity period.

[0007] At present, the stretching exercises involving the articulations of the ankle and of the foot are carried out using fixed structures, typically wall bars and frames, and thus without the assistance of an equipment specifically designed to the purpose. The main negative consequence of it is that frequently one does not succeed in assuming autonomously the correct positions and in performing the suitable movements in order to ensure a full effectiveness of the exercise. Therefore, the assistance of a helper/trainer is often necessary, even to an expert athlete, because incorrect actions, besides failing in bringing the pursued benefits, can be very detrimental to the articulations.

[0008] It has also to be considered that the lack of a specific equipment restrains the possibility of carrying out exercises through which, in a dynamic way, both the flexibility and the steadiness of the articulations of the ankle and of the foot can be improved contemporaneously and with the same efficiency.

[0009] In light of the above, there is a strong need in the field for a new fitness equipment specifically designed for carrying out the mentioned stretching exercises of the articulations of the ankle and of the foot. However, this need has to be satisfied taking into account that such an equipment has necessarily to be compact, easy to handle, and structurally simple, namely in connection with possible home-fitness uses, that is for carrying out - at home and autonomously - low effort exercises.

[0010] The main object of the present invention is to provide a new fitness equipment which, through an original combination of components, is suitable to fully satisfy the above mentioned need.

[0011] A particular object of the present invention is to provide a fitness equipment of the above mentioned kind, which is structurally simple, easy to handle and generally small sized.

[0012] These objects are accomplished with the fitness equipment according to the present invention, comprising a base, a box-type shoe body, for housing a user's foot and pivoted to the base in correspondence to its own tip around a horizontal axis, and elastic means placed between the base and the body, for hindering the rotation of said body around said axis.

[0013] Further features and advantages of the fitness equipment for carrying out exercises involving the muscles and the articulations of the legs according to the invention will be apparent with the following description of a non-limiting, exemplifying embodiment thereof, made with reference to the attached drawings wherein:

- figure 1 shows a side view of the fitness equipment according to the invention, in a non-working configuration;
- figure 2 is a top plan view of the fitness equipment of figure 1;
- figure 3 shows a side view of the fitness equipment of figure 1, in a working position.

[0014] With reference to the above figures, the equipment according to the present invention comprises a base 1, for instance a quadrilateral plate, to which a box-type shoe body 2 - hereinafter referred to as "shoe" for

the sake of simplicity - is pivoted around an horizontal axis 6. Shoe 2 is generally wedge-shaped with a substantially quadrilateral cross section, and comprises a sole wall 2a, vertical side walls 2b and a top wall 2c, joining in a tip 2d which is pivoted along axis 6 and forming a seat 3 open on the side opposite to tip 2d itself.

[0015] In greater detail, two parallel ridges 5, protruding upwards from base 1, extend along a relatively small portion of the overall length of base 1, measured from, and orthogonally to, a short side la thereof. The ends of ridges 5 far from side la are pivotally connected to respective tabs 12, projecting from tip 2d of shoe 2. In this way axis 6 extends between ridges 5, in a way parallel to side la and relatively close thereto.

[0016] Seat 3 is suitable for housing almost completely a foot 4 of a user, drafted in figure 3 with a dashed line. A strap 11, provided with a conventional (not described) length regulating system, extends backwards between the two side walls 2b of shoe 2, for engaging with the back of the heel of foot 4, when this is housed within seat 3, and consequently for preventing it from sliding out, as will result clearer hereinafter.

[0017] Two uprights 7 also protrude from base 1, along a line parallel to pivotal axis 6 of shoe 2, and namely along side la of base 1. Uprights 7 are each substantially adjacent to a corresponding end of a ridge 5, and they have a substantially U-shaped cross section, thus forming respective grooves 7a facing ridges 5 (and therefore shoe 2).

[0018] A couple of helicoidal springs 8 extend between uprights 7 and top wall 2c of shoe 2. Each spring 8 is pivotally connected at a first end to an axle 9, supported horizontally by the respective upright 7 within its groove 7a, and at the other end by a wing 10 projecting outwards from top wall 2c of shoe 2, close to its free edge. As a result, springs 8 elastically hinder the rotation of shoe 2 from a non-working position, shown in figures 1 and 2, in which shoe 2 is kept in a substantially vertical position, the springs being partially placed within grooves 7a of uprights 7. Abutment means, not shown, may be associated to base 1, in correspondence with pivotal axis 6, for stopping shoe 2 in the non-working position.

[0019] The fitness equipment according to the present invention works in the following way. As already mentioned, the user settles a foot 4 within seat 3 of shoe 2, placed in the non-working position, and fastens it by arranging and adjusting strap 11. In such condition, he/she will make shoe 2 rotate and keep it rotated for a certain time, overcoming the elastic hindering action exerted by springs 8. In order to accomplish this result, he/she will necessarily have to strain the muscles and the articulations of the limb, with a stretching action which involves the ankle and the articulations of the tarsus and of the metatarsus.

[0020] The stretching action which is obliged and guided by the equipment can be exploited in a number of different specific exercises, by means of which specific muscular and articular groups, as well as of sinews and ligaments, can be strained in a controlled manner. In fact, the position of the leg involved can be varied, e. g. it can be bent or stretched; furthermore, the foot can be bent so as to stretch the muscles of its top part, as shown in figure 3, or those of its sole part.

[0021] Shoe 2 is preferably provided with a foot-supporting movable block 13, slidable in an adjustable way along the inside of sole wall 2a, so that it can fit all the foot sizes. In the depicted embodiment a screwed bolt 14 extends from sliding block 13 within a slot, not visible, formed longitudinally in sole wall 2a of shoe 2.

[0022] A wing nut 15 engages with bolt 14 and is screwed tight against the outside of sole wall 2a in order to set block 13 into position. Longitudinal ridges 16 extend outwards from sole wall 2a, having the function of abutment elements of shoe 2 against base 1 and also preventing impacts, with consequent possible damages, between base 1 and screwed bolt 14 as a result of the rotation of shoe 2 around pivotal axis 6.

[0023] Therefore, the fitness equipment according to the invention allows an improvement of the flexibility as well as of the steadiness of the articulations of the ankle and of the foot, acting in a dynamic way by means of exercises which are specifically aimed at enhancing the flexibility, the elasticity and the strength of the ankle and of the articulations of the tarsus and of the metatarsus.

[0024] Moreover, the stretching action of the ankle and of the foot does not involve only the flexor and extensor muscles of the ankles and of the toes, but also the front muscles of the thigh, as well as the articulation of the knee, namely the capsula and the ligaments. As the leg is stretched, a conscious alignment action of the malleoluses, the knee and the pelvis can be carried out. Thus, the use of the fitness equipment according to the invention does not involve only the articulations of the foot, but also directly the hip joints and the knees.

[0025] It has to be pointed out that the kind of action which can be carried out with the equipment, and the flexibility of the ankle which can be achieved as a result of said action, can be particularly exploited in all the expressive and sports activities - e.g. dancing, gymnastics and diving - in which the capability of curving the ankle to a great extent is very important also for esthetical reasons.

[0026] The kind and the extent of the effort required to the user will be varied, on the basis of the specific needs, by compelling him/her to keep shoe 2 rotated to a certain slant and for a pre-determined time. In order to assist said adjustment, the equipment may advantageously allow, as in the depicted embodiment, the displacement of the connection of springs 8 to uprights 7, providing a number of holes 7b for supporting axles 9 at different heights. Thanks to this, and also to the fact that springs with suitable features can be chosen, the elastic hindering action can be adapted to the different needs, taking into account that the equipment can be used by athletes, for enhancing the strength and the elasticity of

the articulation but also for prevention and rehabilitation purposes, and generally speaking in the home-fitness field.

[0027] The use in this field is especially profitable, due to the fact that the equipment is easy to use, very versatile, small and compact. Namely, the user itself can plan the training program taking into account his/her own specific needs, simply with the help of a handbook (possibly accompanied or replaced by a video tape), describing and showing how the exercises have to be carried out correctly.

[0028] Advantageously, base 1 and shoe 2 can be made of a plastic material, so that the equipment is very light, easy to handle and can be produced at a low cost. However, base 1 can be weighed down by means of metal inserts.

[0029] Variations and modifications can be made to the fitness equipment for carrying out exercises involving the muscles and the articulations of the legs according to the present invention, without departing from the scope of the invention as defined in the appended claims. In particular, equivalent means for elastically hindering the rotation of shoe 2 can replace springs 8.

Claims

1. A fitness equipment characterised by the fact that it comprises a base (1), a box-type shoe body (2), for housing a user's foot (4) and pivoted to said base (1) in correspondence to its own tip (2b) around a horizontal axis (6), and elastic means (8) placed between said base (1) and said body (2), for hindering the rotation of said body (2) around said axis (6).

2. The fitness equipment according to claim 1, wherein said elastic means (8) extend between a top wall (2c) of said shoe body (2) and said base (1), and they keep said body (2), when not operated, in a substantially vertical non-working position.

3. The fitness equipment according to claims 1 or 2, wherein from said base (1) two uprights (7) protrude, placed along a line parallel to said pivotal axis (6) of said body (2), said elastic means (8) comprising respective springs (8) pivotally connected to said uprights (7) and said body (2).

4. The fitness equipment according to claim 3, wherein said uprights have a substantially U-shaped transversal cross section, defining a groove (7a) facing said shoe body (2), said springs (8) being pivotally supported at a first end by axles (9) extending within said grooves (7a).

5. The fitness equipment according to any of the previous claims, wherein a block (13) for supporting the sole of said foot (4) is placed within said shoe body (2), said block being adjustably slidable along the longitudinal axis of said shoe body (2).

6. The fitness equipment according to any of the previous claims, comprising means (11) for fastening said foot (4) within said shoe body (2).

7. The fitness equipment according to claim 6, wherein said means (11) for fastening said foot (4) within said -shoe body (2) comprise an adjustable strap (11) extending between the sides (2b) of said shoe body (2).

8. The fitness equipment according to any of the claims from 3 to 7, wherein a number of holes (7b) are formed along each of said uprights (7), for the engagement of respective axles (9) pivotally supporting said springs, whereby the distance between said axles (9) and said base can be adjusted.

9. The fitness equipment according to any of the claims from 3 to 8, wherein said base has a substantially quadrilateral top plan outline, said uprights (7) being placed along a side (1a) of said base (1), said pivotal axis (6) of said shoe body (2) being placed relatively close to said side with regard to the overall length of said base (1) measured orthogonally to said side (1a).

10. The fitness equipment according to any of the previous claims, wherein said base (1) comprises abutment means for stopping said shoe body (2) in said non-working position.

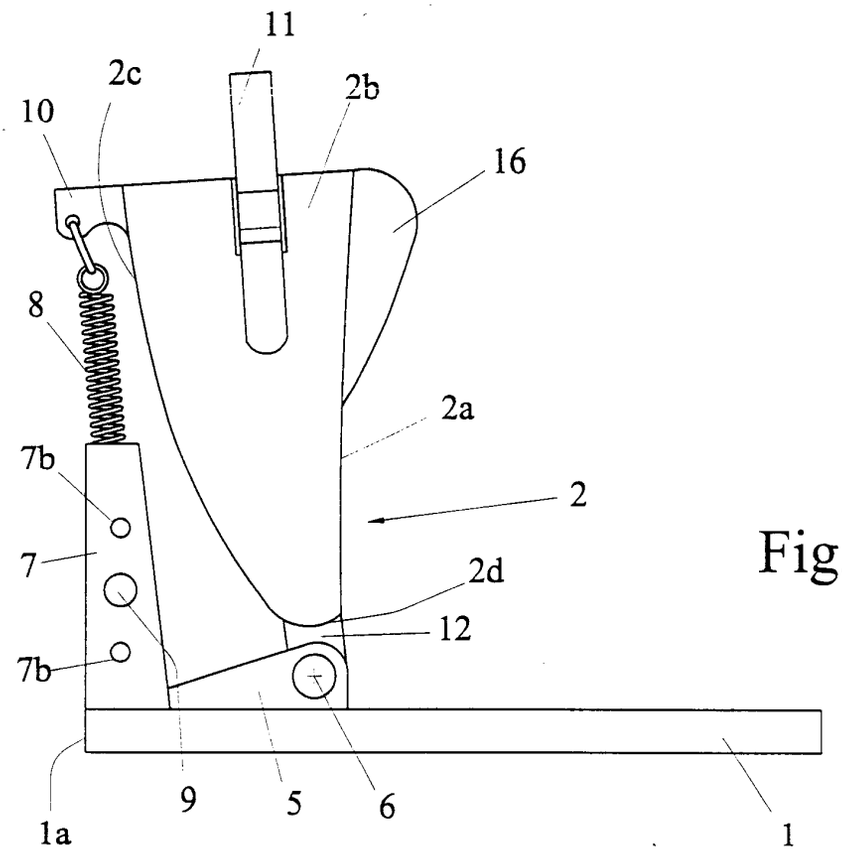
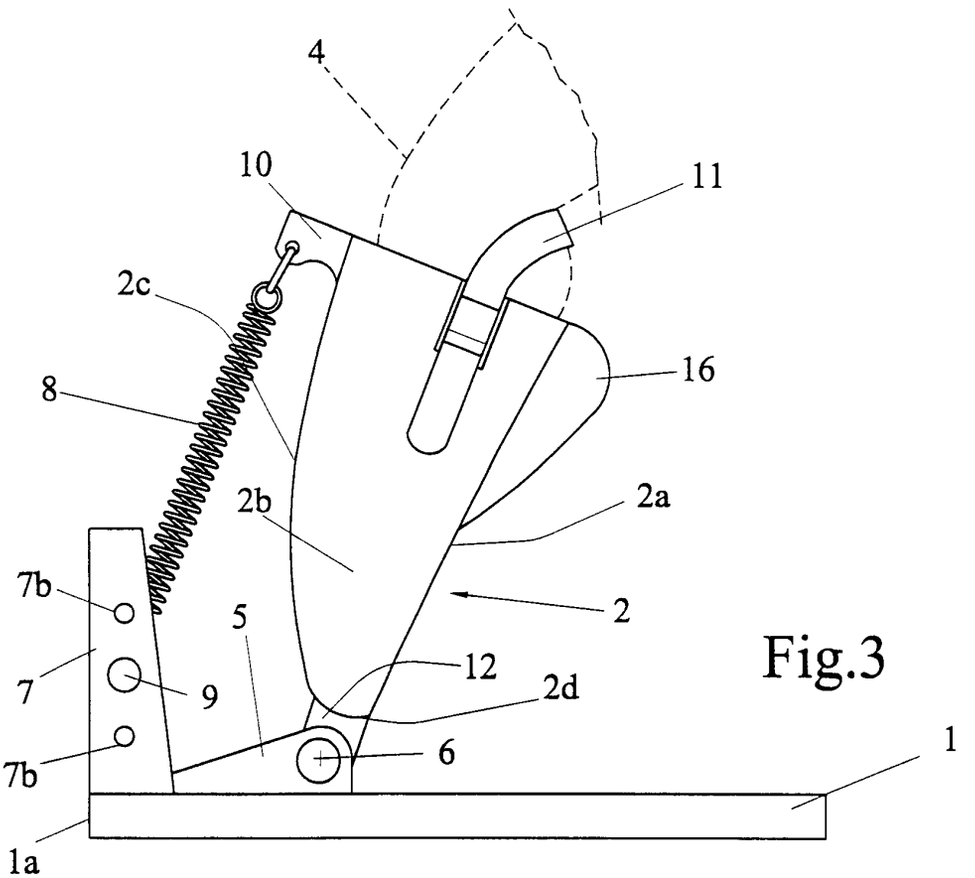

11
2c
2b
10
16
8
2a
7b
2
7
2d
12
7b
9
5
6
1a
1

Fig.1


4
10
11
2c
16
8
2b
2a
7b
2
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12
7
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2d
7b
6
1
1a

Fig.3

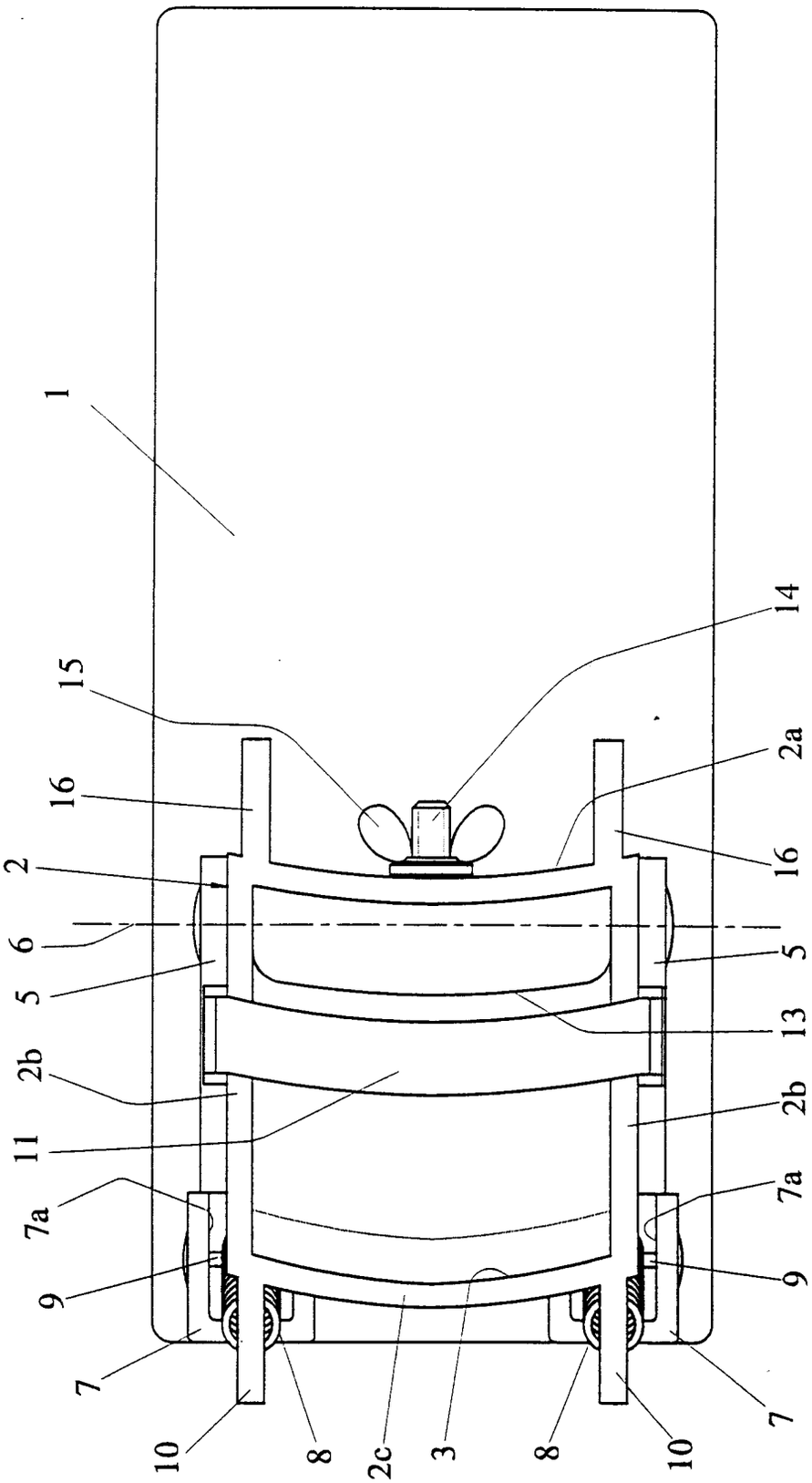

Fig.2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 83 0050

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	22 March 2000	Curzi, D

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 83 0050

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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22-03-2000

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82