



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 614 449 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
11.01.2006 Bulletin 2006/02

(51) Int Cl.:
A63B 21/062 (2006.01)

(21) Application number: **05014584.6**

(22) Date of filing: **06.07.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK YU

(72) Inventors:
• **Eriksson, Christer**
SE-821 51 Bollnäs (SE)
• **Eriksson, Benny**
SE 821 35 Bollnäs (SE)

(30) Priority: **07.07.2004 SE 0401784**

(74) Representative: **Fröderberg, Anders Oskar**
Dr Ludwig Brann Patentbyrå AB,
P.O. Box 171 92
104 62 Stockholm (SE)

(71) Applicant: **Overseas Trade Limited**
London W1F 7LD (GB)

(54) **Blocking device**

(57) The invention relates to a blocking device for training machines of the type that includes a set of weights comprising a plurality of weights arranged on each other, the blocking device (1) comprising two front branches (2, 3), which are separable against the action of a spring force and which are arranged to co-operate

with grips in a lever included in the set of weights. According to the invention, the blocking device (1) comprises a handle (6) connected to at least one branch (2) and means (8, 14) arranged to, in co-operation with the lever, separate the branches (2, 3) upon axially applied tensile and/or pressure forces.

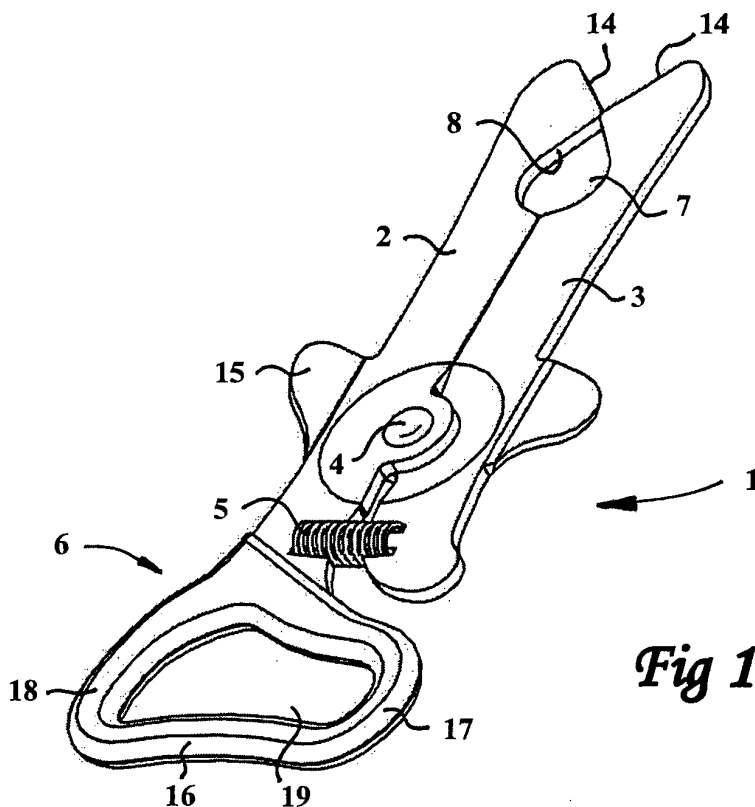


Fig 1

EP 1 614 449 A1

Description

Technical Field of the Invention

[0001] The present invention relates to a blocking device for training machines of the type that includes a set of weights comprising a plurality of weights arranged on each other, the blocking device comprising two front branches, which are separable against the action of a spring force and which are arranged to co-operate with grips in a lever included in the set of weights.

Background of the Invention and Prior Art

[0002] Training machines of the above-mentioned type comprising sets/packages of weights having a plurality of loose weights piled on each other, have for a long time been and still are the most functional and most used machines for muscular training. Apart from a great selection of multifunction machines, today there is also access to specially designed machines adapted for the training of individual muscles or muscle groups in the entire body. Common to the training machines is, however, that a training person often desires to change the load resistance a great number of times in each machine in order to, during the entire training session, obtain a suitable load in each individual exercise, and that the training machines most often are used by a great number of training persons having different load wishes. This is realised by the use of a blocking device that in a simple way is insertable in several places in the set of weights with the purpose of all weights located above the blocking device collectively having to follow the lever when this is lifted as a consequence of a training repetition executed in the training machine.

[0003] At the same time as the load is desired to be simple to change, the blocking device should, however, safely be held in place on the location that is intended to prevent injuries on muscles and machines. Injuries that easily arises if the blocking device comes out of the engagement with the lever, which entails that the load on heavily strained muscles suddenly ceases and the weights fall down in the machine. A blocking device of the type initially mentioned that solves this in a satisfactory way is shown in SE 459 156. Said publication shows a blocking device having two branches, which are turnable around a common hinge in such a way that the parts of the branches located in front of the hinge are spaced apart when the parts of the branches located behind the hinge are pressed together. Thus, a disadvantage is that the training person has to apply a transverse gripping force on the blocking device before the same can be inserted into or pulled out of the set of weights in order to thereby change the load.

[0004] This seems to be entirely problem-free for a person having full moving ability, when pressing together of the fingers of the hand does not involve any problem. For persons having physical handicap in the hands, pressing

together of the fingers only may, however, be extremely difficult, and therefore, for many persons, pressing together a spring-loaded blocking device becomes an impossible task to carry out.

Objects and Features of the Invention

[0005] The present invention aims at obviating the above-mentioned shortcomings of previously known blocking devices and at providing an improved blocking device, which is particularly suitable for persons having physical handicap. Thus, a primary object of the invention is to provide a blocking device, which easily can be handled without great mobility in the fingers being required. Another object of the invention is to provide a blocking device, which can be inserted into and pulled out of a set of weights solely by applying a pressure force and a tensile force, respectively, on the same. An additional object of the invention is to provide a blocking device, which allows simple handling and reliable function at the same time as the risk of squeezing has been reduced considerably.

[0006] According to the invention, at least the primary object is attained by means of the blocking device defined by way of introduction, which is characterized in that the same comprises a handle connected to at least one branch and means arranged to, in co-operation with the lever, separate the branches upon axially imposed tensile and/or pressure forces. Preferred embodiments of the blocking device according to the invention are further seen in the dependent claims 2-9, as well as in the following, detailed

description of preferred embodiments.

Brief Description of the Drawings

[0007] In the drawings:

- Fig. 1 is a perspective view of a blocking device according to the invention with the branches in a collected position,
- Fig. 2 is a view corresponding to figure 1 of a blocking device with the branches in a separated position, and
- Fig. 3 is a perspective view of a part of a training machine with the blocking device in co-operation with a set of weights, in which a number of weights are removed.

Detailed Description of Preferred Embodiments of the Invention

[0008] In figures 1 and 2, a blocking device or a weight fork is shown, generally designated 1, which comprises two branches 2, 3, which are mutually turnably arranged around a hinge 4. Furthermore, the branches are separable against the action of a spring force, which in the

example is provided by a spring element 5. In addition, the blocking device 1 comprises a rear part, which comprises a handle 6. In the embodiment of the invention shown, the spring element 5 consists of a compression spring, which acts between the branches 2, 3 and which is situated between the hinge 4 and the handle 6, whereupon the front ends of the branches 2, 3, located in front of the hinge 4, are actuated to aim toward each other. The spring element 5 may, for instance, instead consist of a tension spring situated in front of the hinge 4. In the example shown, the hinge 4 consists of a pin, which is turnably arranged in hole-provided ears connected to the branches 2, 3.

[0009] In the area of the front ends of the branches 2, 3, the same have opposite recesses 7 in the branch edges facing each other. Jointly, the recesses 7 have the shape of a drip, i.e., an essentially circular shape that is drawn out in the forward direction in such a way that a sliding surface 8 is formed in each recess 7 in the front part of the recess 7. Furthermore, this first pair of sliding surfaces 8 run together in the forward direction at an angle to each other that should be less than 150° , preferably this angle should be acute.

[0010] Now reference is made also to figure 3. The recesses 7 are intended to co-operate with a weight lever or weight collector 10 included in a set of weights 9, more precisely by coming into engagement with grooves or grips 11 arranged axially separated along the length extension of the lever 10. Such a set of weights 9 consists of a plurality of loose weights 12 piled on each other, which are arranged to slide and be guided along guides or sliding bars 13. The blocking device 1 is insertable between two adjacent weights in order to co-operate with the lever 10 with the purpose of, in a safe and reliable way, forcing all weights located above the blocking device 1 to collectively follow the lever 10 and run along the guides 13 when the lever 10 is lifted in any way as a consequence of a training repetition executed in the training machine. The distance between the respective grip 11 may vary as long as the distances correspond to the thicknesses of the individual weights 12. The guides 13 are comprised in a stand (not shown) that constitutes or forms part of a training machine, which may be wall mounted as well as freestanding.

[0011] Furthermore, the branches 2, 3 are also provided with a second pair of sliding surfaces or chamfered edges 14, arranged in front of the recess 7 of the respective branch 2, 3. The second pair of sliding surfaces 14 converge in the backward direction at an angle to each other that should be less than 150° , preferably this angle should be acute. Furthermore, each sliding surface in the second pair 14 should be longer than 15 mm in order to position the blocking device 1 in relation to the lever 10 upon insertion of the same in the set of weights 9 and cause the branches 2, 3 at abutment against the lever 10 to be spaced apart when an axial pressure force is applied to the handle 6. In an analogous way, the sliding surfaces 8 of the recesses 7 have the purpose of, at abut-

ment against the lever 10, separating the branches 2, 3 when an axial tensile force is applied to the handle 6 in order to pull out the blocking device 1 from the set of weights 9. It should be pointed out that the sliding surfaces 8, 14 do not need to be completely straight, but may advantageously be somewhat curved in order to obtain smoother transitions between the same.

[0012] In the preferred embodiment of the blocking device according to the invention shown in the figures, one of the branches 2 is longer than the other seen in the backward direction from the hinge 4. In the example shown in figure 1, the handle 6 is fixedly connected to the longer branch 2 only, the second, short branch 3 only being actuatable in the axial direction by means of the hinge 4. The second pair of sliding surfaces 14 and the first pair of sliding surfaces 8 allow the lever 10 to force apart the front ends of the branches 2, 3, such as has been described above, i.e., get the second, short branch 3 to turn around the hinge 4, when pressure and tensile forces, respectively, are applied to the handle 6 (see figure 2). It should be pointed out that the branches 2, 3 have to be capable of being separated so much that the grips 11 of lever 10 can be inserted into and brought out of the front ends or jaws of the blocking device 1.

[0013] Now reference is made once again to figure 3, in which a part of a training machine is shown. In the figure, a number of weights are removed in order to show how the blocking device 1 and the lever 10 co-operate. The weight plates 12 are provided with slide bushes (not shown) in order to decrease the friction between the weights 12 and the guides 13. The slide bushes are preferably manufactured from nylon and each one has a collar that abuts against the top side of the respective weight plate. The collar works as a distance sleeve between the individual weights 12 in order to enable introduction of the blocking device 1 into the gap that is formed between two adjacent weights 12. Furthermore, the slide bushes also have an absorbing effect against noise and impacts, which protects the hearing of the training persons and the weights 12 from being impaired and damaged, respectively, when the same are dropped against each other. The gap between two adjacent weights is desired to be as small as possible in order for the total height of the set of weights 9 to be as small as possible, and that is why the branches 2, 3 of the blocking device 1 have to be thin in order to be insertable into said gap, however the same must not be so thin that they are deformed by the load they are subjected to during training. In order for the blocking device 1 to have good strength and manage the space limitation, it is suitable to make the branches from metal, or some other material having similar, requisite properties.

[0014] In level with or immediately in front of the hinge 4, the branches 2, 3 may have one or more wings or stop flanges 15, which project from the branches 2, 3 transverse to the extension plane thereof, with the purpose of providing the blocking device 1 a distinct maximum insertion depth, when the wings 15 are pressed against

the front edges of the weights 12, wherein the recesses 7 are in engagement with the lever 10. The distinct insertion depth counteracts that the blocking device 1 is pressed in too far, which reduces the risk of the branches 2, 3 or the hinge 4 being damaged at the same time as a space between the front edge of the weight plates 12 and the wings 15 gives an indication of the recesses 7 of the blocking device 1 not being in engagement with the lever 10 in a satisfying way.

[0015] Now reference is made once again to figure 1. The handle 6 consists of a cross piece 16 and two connecting pieces 17, 18 projecting forward from the cross piece, at least one of which is connected to at least one branch. In a preferred embodiment, the connecting pieces 17, 18 run together while forming a closed, form-stiff ring that in turn is connected to at least one branch 2. The ring surrounds an opening 19, which has a diameter transverse to the length extension of the blocking device and a diameter along the blocking device that is smaller than the transverse diameter, more precisely the opening has a substantially oval basic form. The opening should be dimensioned in such a way that a number of normal-sized fingers, two, three or four, should be possible to be inserted, at which the handle should be wedged up somewhat around the same, i.e., that the blocking device should follow the hand without the fingers having to be closed around the cross piece 16. This is in order to enable a physical handicapped person having limited mobility in the fingers of the hand to use the blocking device 1 and thereby the training machine. Thereby, the transverse diameter should be larger than 40 mm (two fingers). Simultaneously, said transverse diameter should be less than 80 mm (four fingers). In practice, the same may amount to about 60 mm (three fingers). The longitudinal diameter may, in practice, amount to about 20 mm.

[0016] In an alternative embodiment, not shown, one of the connecting pieces 18 is longer than the other, whereupon they, together with the cross piece 16, form a handle 6 that is not closed, the longer connecting piece 18 being connected to at least one branch. In this embodiment, the distance transverse to the length extension of the blocking device 1 between the connecting pieces should be regarded as analogous to the size of the transverse diameter described above, in order to enable, in the similar way, a physical handicapped person to use the blocking device 1.

[0017] The handle 6 can be integrated with one of the branches 2 and then in a suitable way be supplied, for instance, a polyamide coating, preferably by immersing the same in a liquid polyamide mass, which is brought to solidify on the handle 6 after application. Alternatively, the branches 2, 3 may be manufactured separately and a handle 6 separately, whereupon the handle in a suitable way is connected to at least one of the branches. Instead of polyamide, any other suitable material can be used that meets the object of making the handle more grip-friendly at the same time as the same should be wear-resistant.

[0018] In an alternative embodiment, not shown, of the blocking device according to the invention, the branches may essentially be equally long and fixedly connected to the handle. In other words, such a construction lacks a hinge around which the branches can turn, and also a physical, individual spring element in order to urge the front ends of the branches together. In this alternative embodiment of the blocking device according to the invention, instead the branches have waists near the handle, at which the branches can be deflected from each other against the inherent spring force or elasticity of the same.

Feasible Modifications of the Invention

[0019] The invention is not solely limited to the embodiments described above and illustrated in the drawings. Thus, it is not necessary that the branches should enclose the lever but one branch may, for instance, be arranged to be stuck into the corresponding hole in the lever, the other branch coming into engagement with an external groove on the lever or that both branches come into engagement with holes in the lever. The extension plane of the handle and the extension plane of the branches do not have to coincide, even if still preferred, but the handle may be arranged in a plane that is turned at an arbitrary angle in relation to the extension plane of the branches. Furthermore, the hinge and the spring element may be realized in multiple ways, they may, for instance, be integrated in one unit. It should also once again be pointed out that the handle does not need to be in the shape of a closed ring in order to get a form-stiff property, from a manufacturing point of view it may even be preferred that the ring is not closed without because of this losing the stiffness thereof. With form-stiff, it is meant herein a shape that is not changed much when forces are applied to the same, i.e., the shape is allowed to be somewhat elastic without the general idea according to the invention being deviated from. Furthermore, the handle does not have to be fixedly connected to the branches but may be fixedly connected to or constitute a part of the hinge around which the branches are turnably arranged.

Claims

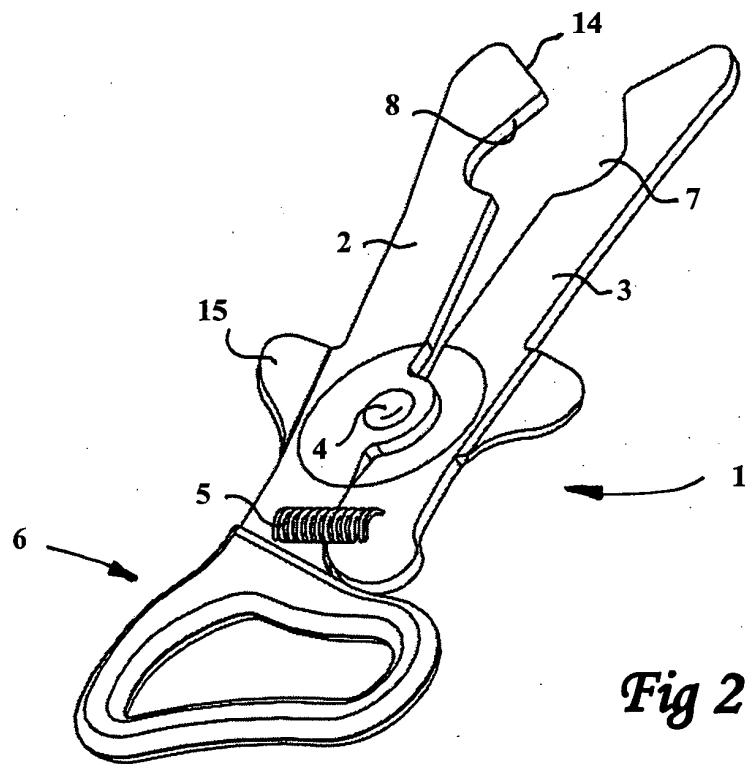
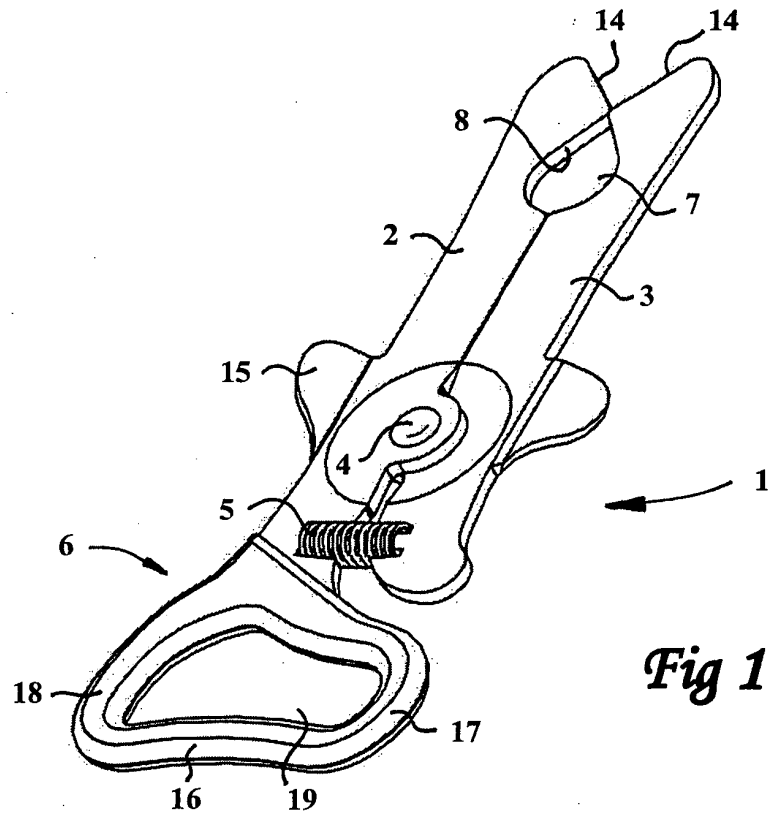
1. Blocking device for training machines of the type that includes a set of weights (9) comprising a plurality of weights (12) arranged on each other, the blocking device (1) comprising two front branches (2, 3), which are separable against the action of a spring force and which are arranged to co-operate with grips (11) in a lever (10) included in the set of weights (9), **characterized in that** the blocking device (1) comprises a handle (6) connected to at least one branch (2) and means (8, 14) arranged to, in co-operation with the lever (10), separate the branches (2,

3) upon axially applied tensile and/or pressure forces.

2. Blocking device according to claim 1, **characterized in that** said means (8) comprises a first pair of sliding surfaces included in opposite recesses (7) arranged in the area of the front ends of the branches (2, 3). 5
3. Blocking device according to claim 2, **characterized in that** said means (14) comprises a second pair of sliding surfaces arranged in the front ends of the branches (2, 3) in front of the first pair of sliding surfaces (8). 10
4. Blocking device according to any one of claims 1-3, **characterized in that** the handle (6) is form-stiff and fixedly connected to at least one branch (2). 15
5. Blocking device according to any one of claims 1-4, **characterized in that** the handle (6) includes a rear cross piece (16), which extends transverse to the length extension of the branches (2, 3). 20
6. Blocking device according to claim 5, **characterized in that** the handle (6) is in the shape of a closed, form-stiff ring comprising the rear cross piece (16), as well as two connecting pieces (17, 18), which converge in the forward direction from the cross piece (16). 25
30
7. Blocking device according to any one of the preceding claims, **characterized in that** the handle (6) and the branches (2, 3) extend in a common plane.
8. Blocking device according to any one of the preceding claims, the branches being inter-connected via a hinge (4) and loaded by a spring (5), which aims to bring together the portions of the branches (2, 3) that extend forward from the hinge, **characterized in that**, of the portions of the branches (2, 3) that extend rearward from the hinge (4), one is longer than the other and connected to the handle (6). 35
40
9. Blocking device according to claim 8, **characterized in that** the spring (5) consists of a compression spring located between the hinge (4) and the handle (6). 45

50

55



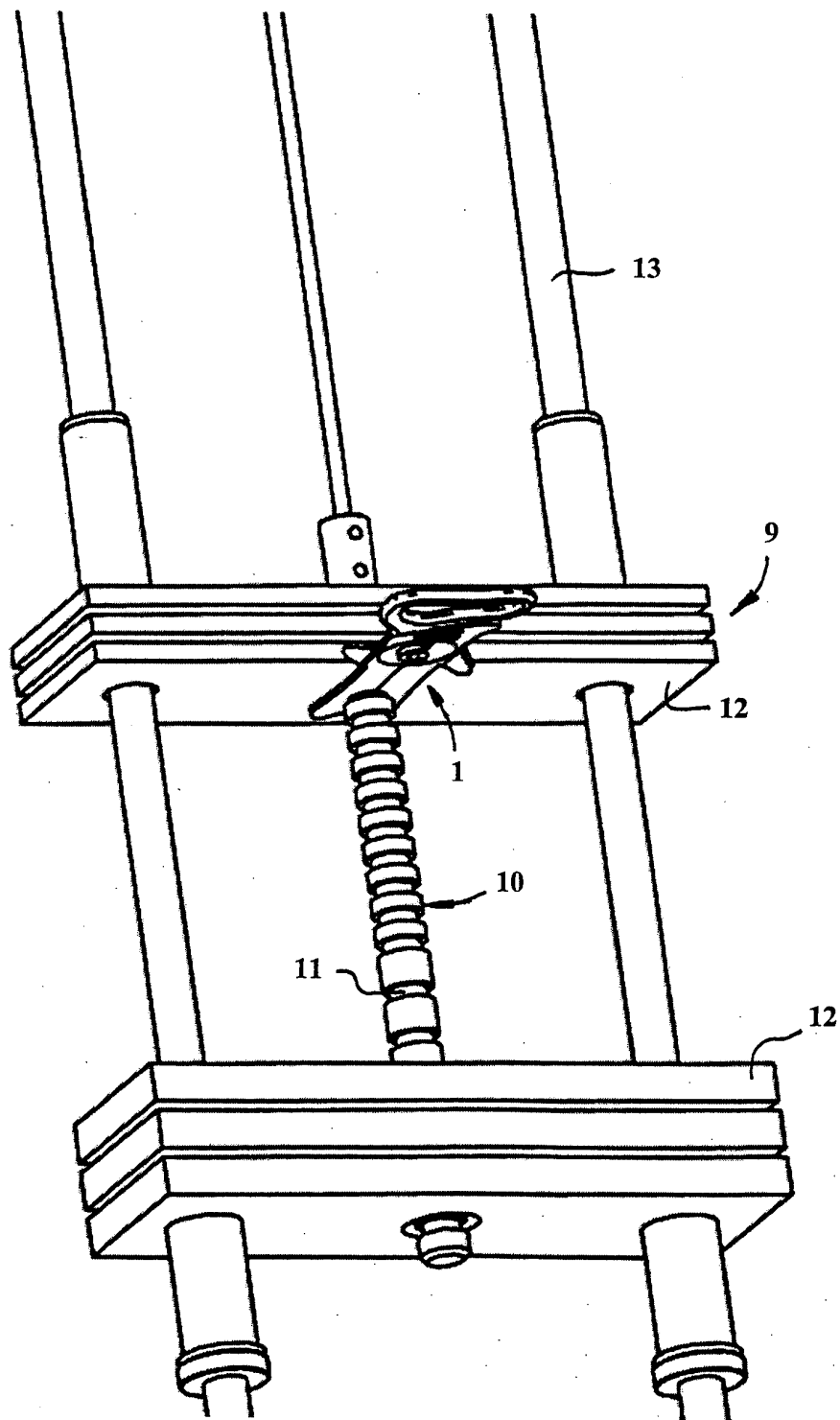


Fig 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 4584

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 01/00919 A (WYBROW, BRIAN, ROBERT, ALFRED) 4 January 2001 (2001-01-04)	1-7	A63B21/062
Y	* abstract * * page 1, line 28 - line 30 * * page 19, line 1 - line 6 * * page 19, paragraph 2 * * figures 29A,29B * -----	8,9	
Y	US 4 953 266 A (TRINKAUS ET AL) 4 September 1990 (1990-09-04) * figure 9 * * column 2, line 50 * * column 2, line 61 - line 65 * -----	8,9	
X,D	SE 459 156 B (HEAVY GYM PRODUCTION AB) 12 June 1989 (1989-06-12) * the whole document * -----	1,2	
A	WO 01/31108 A (READMARK; BARRE, BERTRAND; LEPAGE, FRANCIS) 3 May 2001 (2001-05-03) * figure 1 * -----	8,9	TECHNICAL FIELDS SEARCHED (Int.Cl.7) D06F A45D F16B A63B B25B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 21 September 2005	Examiner Tejada Biarge, D
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

5
EPO FORM 1503 03.82 (P04001)

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

EP 05 01 4584

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-09-2005

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0100919	A	04-01-2001	AU	5553100 A	31-01-2001
			EP	1175526 A1	30-01-2002
			GB	2352269 A	24-01-2001

US 4953266	A	04-09-1990	EP	0359936 A1	28-03-1990
			JP	2107206 A	19-04-1990
			US	5044050 A	03-09-1991

SE 459156	B	12-06-1989	SE	8802477 A	16-06-1989

WO 0131108	A	03-05-2001	FR	2777917 A1	29-10-1999
