



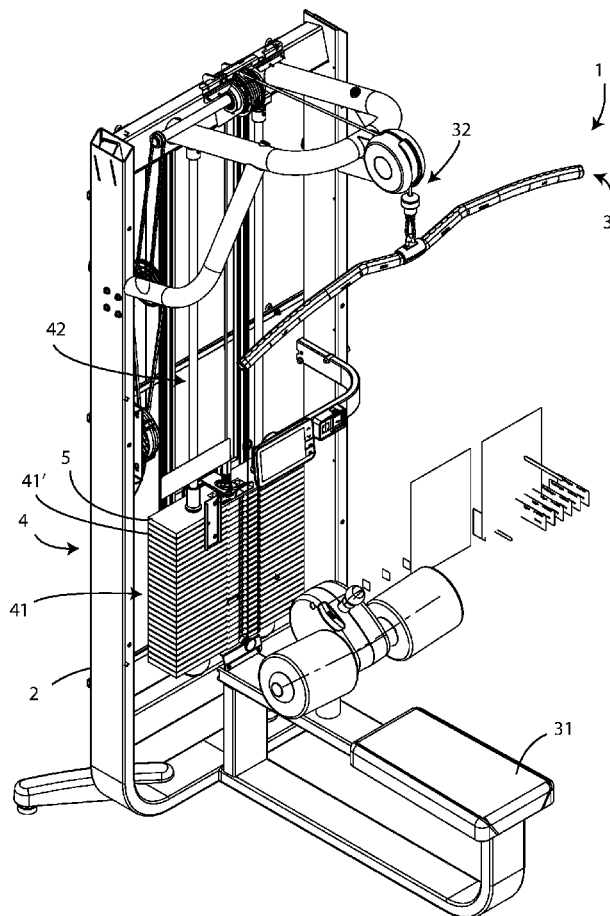
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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2017/0095686 A1**
(43) **Pub. Date:** **Apr. 6, 2017**(54) **SYSTEM FOR ADJUSTING A LOAD FOR GYMNASTIC MACHINES AND TENSIONING AND RETURNING DEVICE OR SAID SYSTEM FOR ADJUSTING**(52) **U.S. Cl.**
CPC *A63B 21/063* (2015.10); *A63B 21/062* (2013.01); *A63B 21/154* (2013.01); *A63B 21/151* (2013.01)(71) Applicant: **TECHNOGYM S.P.A.**, CESENA FC (IT)(72) Inventors: **Rocco Andrea GALANTE**, CESENA FC (IT); **Simone CASAGRANDE**, CESENA FC (IT); **Filippo CRUDI**, CESENA FC (IT)(21) Appl. No.: **15/284,272**(22) Filed: **Oct. 3, 2016**(30) **Foreign Application Priority Data**

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A63B 21/062 (2006.01)
A63B 21/00 (2006.01)(57) **ABSTRACT**

A system for adjusting a load movable along a vertical direction for gymnastic machines provided with a frame, said system comprising a supporting member of said mobile load, provided with a plurality of adjustment holes, said movable load consisting of a plurality of weights arranged stacked and selectable, a selector member to be inserted in one of said adjustment holes of said supporting member, in order to select a group of said weights, adjusting said movable load and a string having an end fixed to said selector member, said system comprising tensioning means of said string, to keep said string in tension when said selector member is inserted in one hole of said plurality of adjustment holes, and to return said selector member when it is disengaged from said plurality of adjustment holes. The system also concerns a tensioning and returning device.



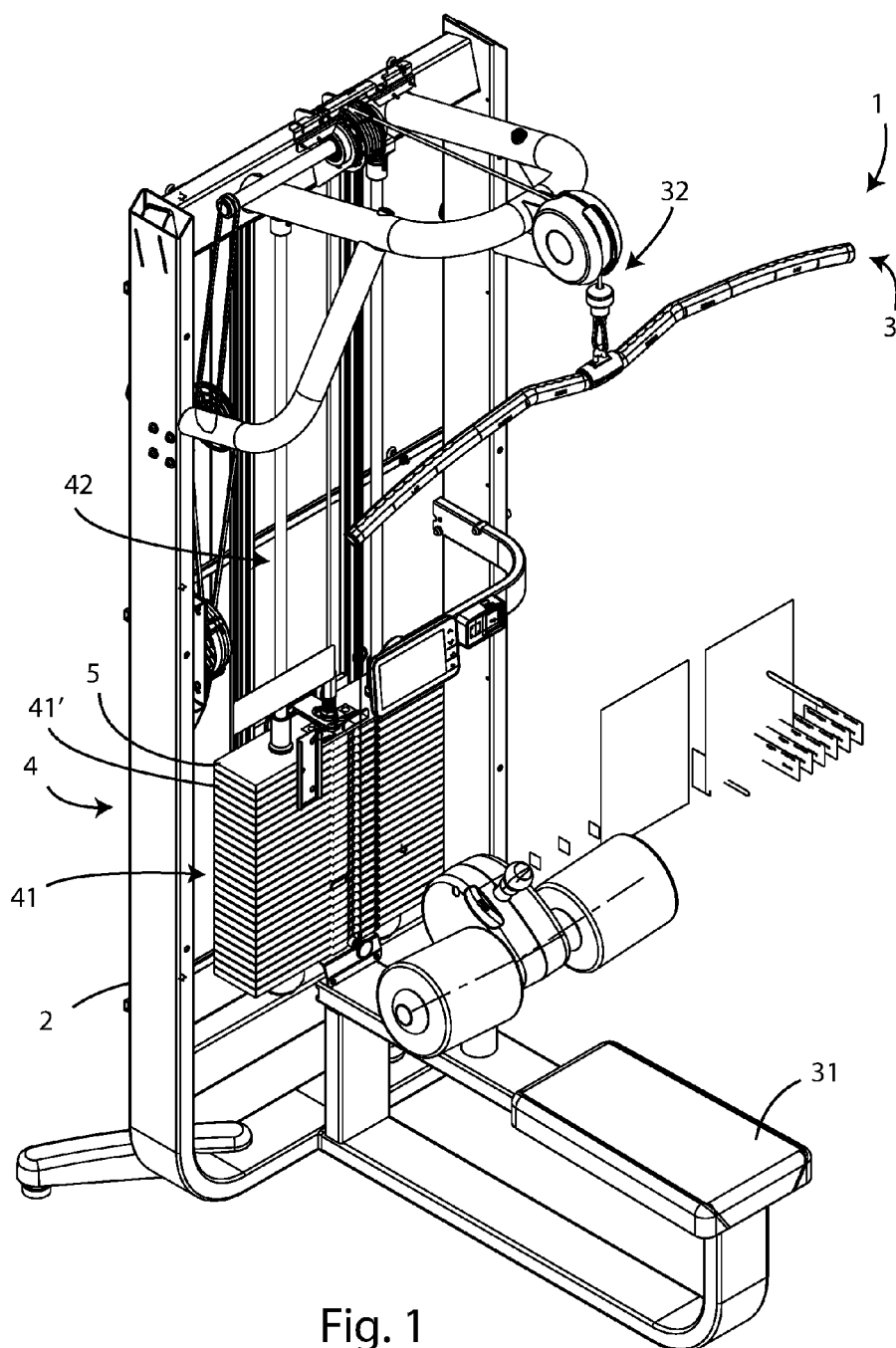


Fig. 1

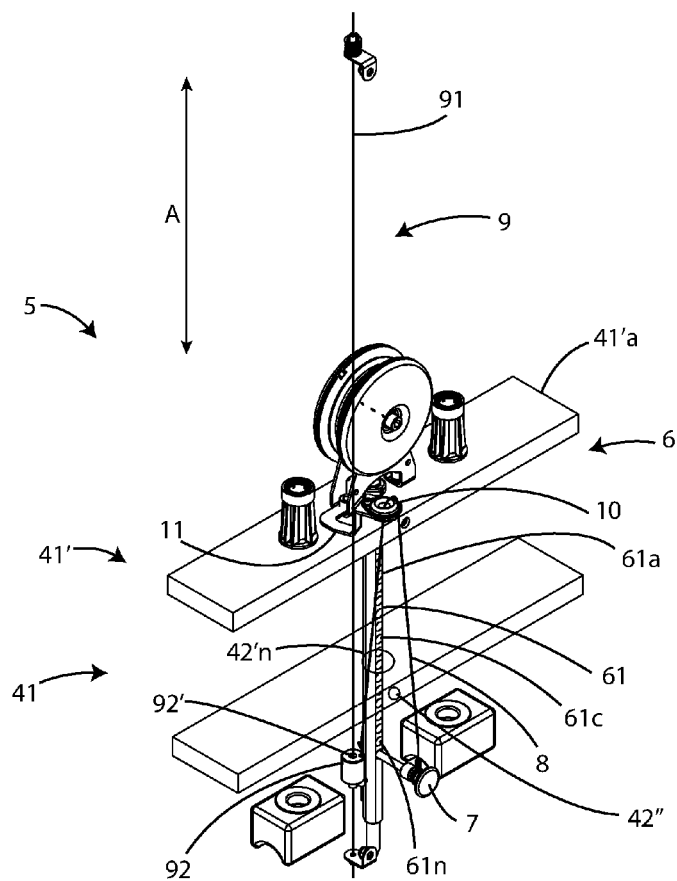


Fig. 2

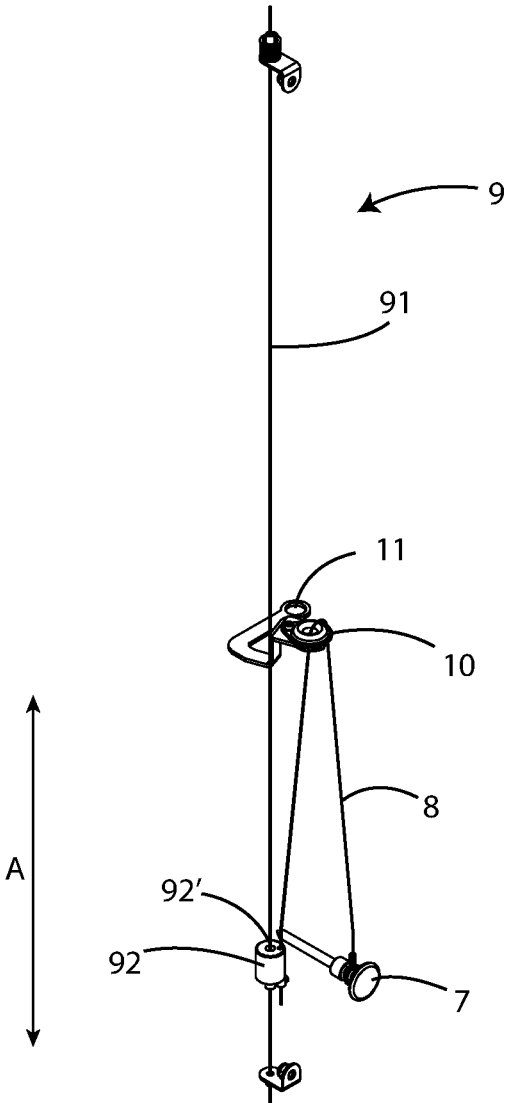


Fig. 3

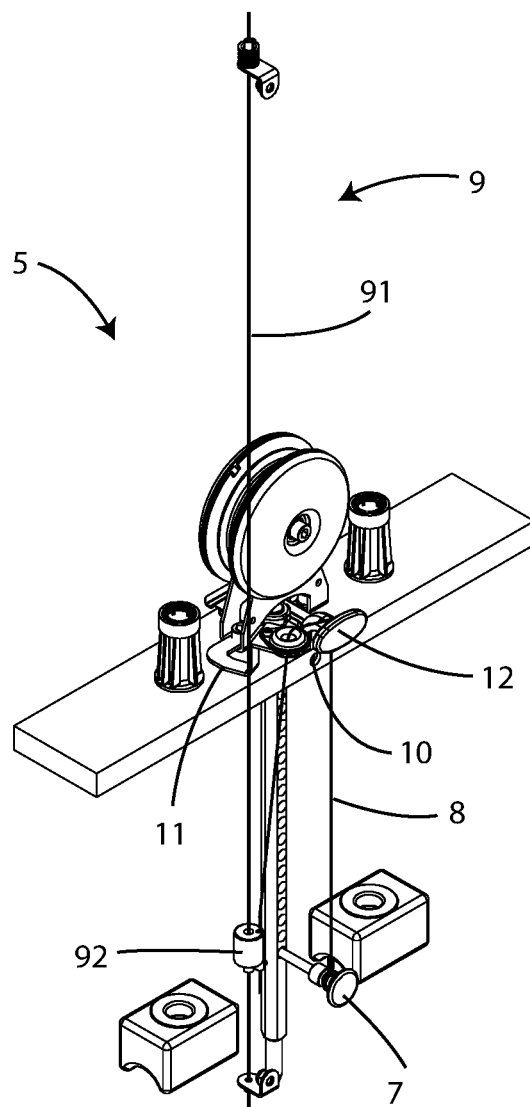


Fig. 4

**SYSTEM FOR ADJUSTING A LOAD FOR
GYMNASTIC MACHINES AND TENSIONING
AND RETURNING DEVICE OR SAID
SYSTEM FOR ADJUSTING**

[0001] The present invention relates to a system for adjusting a load for gymnastic machines.

[0002] The present invention relates also to a tensioning and returning device or said adjusting system.

[0003] More specifically, the invention concerns a system of the above type, studied and realized in particular for adjusting the weight of the load group or weights pack of an exercise machine for the execution of exercises.

[0004] In the following, the description will be directed to exercise machines for strength training of the type comprising a resistance unit of gravitational type, but it is clear that the same should not be considered limited to this specific use.

[0005] As is well known, there are exercise machines to perform exercises in gyms, sports centers or medical rehabilitation centers, based on a load lifting group.

[0006] Said machines, also known as to strength training machines, essentially comprise a frame and a drive assembly, installed on the frame, on which a user can act to perform the exercises.

[0007] Said machines also include a load group, having an adjustable load, connected by means of suitable connecting members to said drive assembly, and means for adjusting the load itself. Said load is normally constituted by a plurality of weights or blocks, typically arranged stacked one on the other, vertically movable. Said adjusting means instead comprise a load support member, known as "cruise", having a first weight or "brick" coupled to an elongated member, arranged vertically, parallel to the movement of the load, also known as "dip", provided with a plurality of holes.

[0008] The stacked weights or bricks are also perforated, and said dip is inserted through said holes.

[0009] The adjustment means also comprise a pin insertable through a further hole on the bricks, so as to engage with one of said holes of the dip. In this way, a weight is adjusted for the execution of the exercise given by the sum of bricks arranged above the pin. In such a way, the user performs the exercise with the suitably adjusted load.

[0010] To avoid that the pin to get lost, it is typically connected to the machine, in particular to the cruise, by means of a lanyard.

[0011] However, the lanyard remains slack when selecting the weight closer to the attachment point of the lanyard itself. This implies that lanyard may fit between the weights or get stuck, with the risk of breaking.

[0012] Therefore, in order to limit this problem, the use of elastic spiral lanyards is known, which allow varying its own length, thus remaining less slack.

[0013] However, these lanyards over time tend to lose their elasticity due to use, so as to be too slack and worn.

[0014] In the light of the above, it is, therefore, object of the present invention to propose a load regulation system for exercise machines capable to overcome the prior art limitations of the systems according to the prior art.

[0015] It is further object of present invention to provide a regulation system that is less subject to wear during the use of the exercise machine.

[0016] It is therefore specific object of the present invention a system for adjusting a load movable along a vertical direction for gymnastic machines provided with a frame,

said system comprising a supporting member of said mobile load, provided with a plurality of adjustment holes, said movable load consisting of a plurality of weights arranged stacked and selectively selectable, a selector member intended to be inserted in one of said adjustment holes of said supporting member, in order to select a group of said weights, adjusting said movable load, and a string having an end fixed to said selector member, said system being characterized by comprising tensioning means of said string, to keep said string in tension when said selector member is inserted in one hole of said plurality of adjustment holes, and to return said selector member when it is disengaged from said plurality of adjustment holes.

[0017] Further according to the invention, said tensioning means comprise a tensioning device having a guide, connectable to said frame of said gymnastic machine, and a counterweight movable slidably along said guide, to which said string is fixed.

[0018] Preferably according to the invention, said guide is a wire, arranged substantially parallel to said vertical direction, having the ends fixed to said frame, said counterweight having a through hole through which said cable is inserted.

[0019] Still according to the invention, said tensioning device comprises at least one return element of said string, such as a ring or the like.

[0020] Further according to the invention, said at least one return element is fixed to said supporting member by a bracket or the like.

[0021] Preferably according to the invention, said at least one return element is arranged in such a way that said string is tilted with respect to said guide, when it is tensioned, so as to form a "V" with said guide.

[0022] Still according to the invention, said tensioning means comprise a winder spring of said string.

[0023] Further according to the invention, said supporting member comprises an elongated element parallel arranged and movable with respect to said vertical direction, said plurality of adjustment holes being obtained on said elongated element, a first weight of said plurality of weights being integral with said elongated element, and each one of said weights have a first through hole, through which said elongated element is insertable, and a second through hole, substantially perpendicular to said first through hole, arranged so that when said weights are stacked and said elongated element is inserted in said first through holes, each of said second through hole of each one of said weights is arranged in correspondence of a respective adjustment hole of said elongated element.

[0024] Preferably according to the invention, said system comprises a lever movably coupled with said movable load, and said string is kept in tension by said tensioning means and by said lever.

[0025] It is further object of the present invention a tensioning and returning device for a system for adjusting a movable load of a gymnastic machine characterized by comprising a selector member capable to adjust said movable load, a string having an end fixed to said selector member, a guide substantially vertically arranged, a counterweight slidably movable along said guide, to which said string is fixed.

[0026] Further according to the invention, said device comprises at least one return element of said string, such as a ring or the like.

[0027] Preferably according to the invention, said at least one return element is arranged so that said string is tilted, when it is tensioned, with respect to said guide, so as to form a “V” with said guide.

[0028] Still according to the invention, said counterweight has a through hole and said guide is a cable inserted in said through hole. Further according to the invention, said device comprises a bracket or the like to fix said return element to said gymnastic machine.

[0029] The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

[0030] FIG. 1 shows an overview of a gymnastic machine provided with a load setting of a system for exercise machines according to the present invention;

[0031] FIG. 2 shows a perspective front view of a first embodiment of the adjustment system, object of the present invention;

[0032] FIG. 3 shows a perspective front view of some elements of the adjustment system according to FIG. 2;

[0033] FIG. 4 shows a perspective front view of a second embodiment of the control system, object of the present invention.

[0034] In the various figures, similar parts will be indicated by the same reference numbers.

[0035] FIG. 1 shows an exercise machine, generally indicated by the reference number 1, provides with the system for adjusting a load for gymnastic machines object of the present invention.

[0036] The gymnastic machine 1 essentially comprises a frame 2, a drive assembly 3, installed on said frame 2, a loading unit 4 and an adjusting system 5 of the load.

[0037] The drive unit 3 is equipped, in this case, with a seat 31 and groups of levers 32, for the execution of the exercises by a user.

[0038] The loading unit 4, arranged on said frame 2, comprises a movable and adjustable load 41, connected by means of suitable connection members 42 to the levers 32 of said actuation assembly 3.

[0039] The moving load 41 comprises a plurality of weights or bricks 41', stacked one on the other, vertically movable in a vertical direction A.

[0040] Said adjusting system 5 comprises a support member 6 of the movable load 41, known as “cruise”, having a first weight or brick 41'a of said movable load 41 and an elongated member 61, arranged vertically, parallel to the movement of the movable load 41 (i.e. to said vertical direction A), also known as “dip”, provided with a plurality of adjacent holes 61a, 61b, . . . , 61N obtained on the lateral surface.

[0041] Each one of said plurality of stacked weights 41' has a first through hole 41'n, so that said dip 61 can be inserted through said through holes 41'n.

[0042] Said adjusting system 5 also comprises a selector member or pin 7, insertable into a second through hole 42'n formed on said weights or bricks 41', so as to engage with one of the holes 61a, 61b, . . . , 61N of said dip 61, corresponding to said second hole 42'n of a brick 41'. In this way, a total weight is adjusted for the execution of the exercise, given by the sum of the weights 41' stacked above the one said pin 7 is inserted therein. The user can then perform the exercise with the movable load 41 appropriately adjusted.

[0043] Normally the bricks 41' have all the same weight, with the exception of the first brick 41'a, which has a weight equal to half of each of said bricks 41'.

[0044] For example, if each one of the blocks 41' weighs 5 kg, the first brick 41'a will have a weight of 2.5 kg.

[0045] Said pin 7 is connected to said support member 6 of the load 41 by means of a lanyard 8, which has a first end fixed to said pin 7 and a second end fixed to tensioning means described below.

[0046] Referring to FIGS. 2 and 3, it is observed that said adjusting system 5 comprises means for tensioning the lanyard 8, to prevent that the same lanyard 8 can intertwine with parts of the gymnastic machine 1. In particular, in the present embodiment, said tensioning means comprise a tensioning device 9 of said lanyard 8, adapted to keep it in tension when the pin 7 is inserted into one of the adjustment holes 61a, 61b, 61N, and return it when it is extracted.

[0047] Said tensioning device 9 comprises a guide or cable 91, which is arranged substantially parallel to said vertical direction A, having a first and a second end, both fixed to said frame 2 of said gymnastic machine 1.

[0048] Said tensioning device 9 also comprises a counterweight 92, having a through hole 92', which said cable 91 passes therethrough. Said counterweight 92 can slide on said cable 91 and movable according to the vertical direction A.

[0049] The second end of said lanyard 8 is fixed to said counterweight 92.

[0050] Referring in particular to FIG. 2, it is observed that said tensioning device 9 also comprises a return element 10 of said lanyard 8, which in this embodiment is a ring that is fixed to said support member 6, in particular to said first brick 41'a, by means of a bracket 11 or the like.

[0051] Said lanyard 8, therefore, is fixed to said pin 7 at a first end and to said counterweight 92 at second end, passing through said return ring 10.

[0052] When said pin 7 is inserted into a hole of said plurality of adjustment holes 61a, 61b, . . . , 61N, said lanyard 8 is preferably inclined with respect to said guide 91, so as to form a “V” with it.

[0053] FIG. 4 shows a second embodiment of said adjusting system 5, in which a lever 12 is provided, also referred to as “knight”, removably coupled with said first weight or brick 41'a, so as to exclude or include in the movable load 41.

[0054] Said lever 12 is used by the user to exclude or include said brick 41'a in the setting of the movable load 41 for performing an exercise.

[0055] In this way, the user can adjust a load, both according to intervals equal to the weight of the single brick 41', and according to intervals equal to half of the weight of a single brick 41'.

[0056] In this second embodiment of said adjusting system 5 said lanyard 8 is also returned by said lever 12. In particular, the lanyard 8, fixed at a first end to said pin 7 and at said second end to said counterweight 92, is returned both by said transmission ring 10 and with the lever 12.

[0057] In a possible further embodiment of said adjusting system 5, not shown in the figures, said tensioning means comprise a spring-winder of said lanyard 8, so as to return it when it is disengaged from one of the adjustment holes 61a, 61b, . . . , 61N.

[0058] The operation of the adjusting system 5 described above is as follows.

[0059] When a user wishes to perform exercises by the exercise machine 1, he sits on that seat 31 and adjusts the

moving load **41** necessary for carrying out the exercise. To this end, he inserts said pin **7** in an adjustment hole **61a**, **61b**, . . . , **61N**, in order to select a group of bricks **41'** corresponding to the weight required for the execution of the exercise.

[0060] The counterweight **92**, pulled by the lanyard **8**, slides upwards vertically according to the vertical direction A along said cable **91**. The lanyard **8** is kept under tension. Furthermore, the lanyard **8**, passing through said transmission ring **10**, is generally subject to a limited wear.

[0061] After adjusting the moving load **41**, the user performs the exercise by acting on said actuating unit **3**, in particular on said groups of levers **32**.

[0062] Accordingly, said selected moving load **41** moves vertically according to the vertical direction A by means of said connecting members **42**. During exercises the lanyard remains always in tension and never slack.

[0063] When the user has finished the exercise, he removes said pin **7** from the adjustment hole, in which it was previously inserted, accordingly said counterweight flows downwardly along said cable **91**, by gravity, so as to return said pin **7**, by means of said lanyard **8**, to said transmission ring **10**.

[0064] In this way, said lanyard **8** remains in tension when the user selects the load required to perform the exercise, by inserting said pin **7** in one of said adjustment holes **61a**, **61b**, . . . , **61N**. When the user extracts the pin **7** from the adjustment hole **61a**, **61b**, . . . , **61N**, pin **7** itself is returned toward said transmission ring **10** by said lanyard **8**.

[0065] As it is obvious from the above description, adjustment system **5** allows to keep always in tension the lanyard **8**, which is connected to said pin **7**, when it is inserted or extracted in/from one of the adjustment holes **61a**, **61b**, . . . , **61N**. In this way, preventing said lanyard **8** from twisting around to the movable load **41** is possible.

[0066] An advantage of the present invention is that the parts of said tensioning and return device are subject to little wear.

[0067] The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

1. System for adjusting a load movable along a vertical direction for gymnastic machines provided with a frame, said system comprising:

- a supporting member of said mobile load, provided with a plurality of adjustment holes, said movable load consisting of a plurality of weights arranged stacked and selectively selectable,
- a selector member intended to be inserted in one of said adjustment holes of said supporting member, in order to select a group of said weights, adjusting said movable load, and
- a string having an end fixed to said selector member, said system being characterized by comprising tensioning means of said string, to keep said string in tension when said selector member is inserted in one hole of said plurality of adjustment holes, and to return said selector member when it is disengaged from said plurality of adjustment holes.

2. System according to claim 1, characterized in that said tensioning means comprise a tensioning device having:

a guide, connectable to said frame of said gymnastic machine, and

a counterweight movable slidingly along said guide, to which said string is fixed.

3. System according to claim 1, characterized in that said guide is a wire, arranged substantially parallel to said vertical direction, having the ends fixed to said frame, said counterweight having a through hole through which said cable is inserted.

4. System according to claim 2, characterized in that said tensioning device comprises at least one return element of said string, such as a ring or the like.

5. System according to claim 1, characterized in that said at least one return element is fixed to said supporting member by a bracket or the like.

6. System according to claim 4, characterized in that said at least one return element is arranged in such a way that said string is tilted with respect to said guide, when it is tensioned, so as to form a "V" with said guide.

7. System according to claim 1, characterized in that said tensioning means comprise a winder spring of said string.

8. System according to claim 1, characterized:

in that said supporting member comprises an elongated element parallel arranged and movable with respect to said vertical direction, said plurality of adjustment holes being obtained on said elongated element, a first weight of said plurality of weights being integral with said elongated element, and

in that each one of said weights have a first through hole, through which said elongated element is insertable, and a second through hole, substantially perpendicular to said first through hole, arranged so that when said weights are stacked and said elongated element is inserted in said first through holes, each of said second through hole of each one of said weights is arranged in correspondence of a respective adjustment hole of said elongated element.

9. System according to claim 1, characterized:

in that it comprises a lever movably coupled with said movable load, and

in that said string is kept in tension by said tensioning means and by said lever.

10. Tensioning and returning device for a system for adjusting a movable load of a gymnastic machine characterized by comprising:

- a selector member capable to adjust said movable load,
- a string having an end fixed to said selector member,
- a guide substantially vertically arranged, and
- a counterweight slidingly movable along said guide, to which said string is fixed.

11. Device according to claim 1, characterized by comprising at least one return element of said string, such a ring or the like.

12. Device according to claim 1, characterized in that said at least one return element is arranged so that said string is tilted, when it is tensioned, with respect to said guide, so as to form a "V" with said guide.

13. Device according to claim 10, characterized in that said counterweight has a through hole and said guide is a cable inserted in said through hole.

14. Device according to claim 11, characterized by comprising a bracket or the like to fix said return element to said gymnastic machine.