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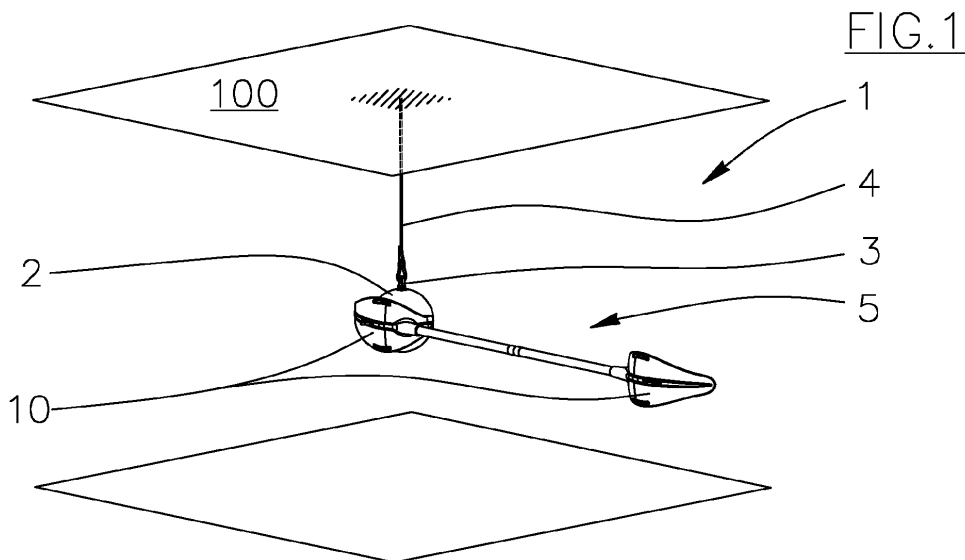
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(54) **TRAINING EQUIPMENT**

(57) A training equipment comprises:
 - a weight (2);
 - a connection means (3) constrained to the weight (2);
 - a suspension means (4) of the weight (2), secured at an end to the connection means (3) and at another end to a support element (100), and which keeps the weight (2) suspended and free to oscillate in correspondence of a use condition (U) of the equipment (1);

- a grasp means (5) which interacts with the weight (2) for the movement thereof by a user in the use condition (U).

The grasp means (5) comprises at least one blade (10), having a rear surface (11b) and a front surface (11a), with the front surface (11a) defining a concavity (15) almost complementary to at least a portion of the weight (2).



(52) Cooperative Patent Classification (CPC): (Cont.)
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Description

[0001] The present invention refers to the field of gymnastic equipment, and it relates, in particular, to a training equipment.

[0002] It's known that in the field of gymnastics and sports the use of a training tool comprising a weight having one or more layers of external coating of a semi-rigid material, for example rubber and/or vinyl polymers, and having an internal cavity housing a quantity of fluidic and/or solid material, such as water, sand or metal balls, such as to provide the weight with a certain mass.

[0003] The weight is assigned to be grasped, lifted, moved, thrown or used in various gymnastic activities by one or more users, during the performance of specific physical exercises aimed at improving muscle strength, agility, reflexes.

[0004] The weight can be equipped with handles welded to it or removably fixed to it, such as to allow a user to grasp the weight more firmly.

[0005] Furthermore, there are known training equipments comprising the weight and further tools for performing physical exercises. For example, a known barbell is fixed to its each end a weight, assigned to be employed in weightlifting and movement exercises.

[0006] Document US20160016032A1 describes an exercise device comprising an anchor member formed of inelastic straps connected in a "T" shape; the lower end is closed in a ring for attaching a weight, and respective handles are attached to the two upper ends for a user to grip the device and lift the weight.

[0007] Document US20170182348A1 discloses an exercise apparatus having a support member hanging from a support at one end and connected to the center of a rigid member at the opposite end. The apparatus also has a handle whose ends are connected to the ends of the rigid member by means of an elongated flexible member.

[0008] Document US20170087435A1 describes a vertically adjustable double end bag system suspended from a fixed support by means of one or two flexible cords or of substantially fixed length.

[0009] Document US10675501B2 discloses an adjustable exercise suspension system comprising a suspension strap assembly with adjustable length attached at one end to a fixed overhead support structure and at an opposite end to a weight. The strap assembly has a plurality of straps detachably interconnected. The weight keeps the suspension assembly under tension, and it can be moved manually by a user during the exercise routine along curved trajectories along a plane. The suspension assembly guides the weight along stable trajectories, minimizing the risk of injury for the user. The resistance of the system varies according to the mass of the weight that is hung to the suspension strap assembly.

[0010] Document WO2010048660A1 describes an exercise system for strength, stability and motor control training, particularly suitable for stabilizing muscles and

for coordinated multi-planar movements of the body.

[0011] The main disadvantage of the known equipment consists in the fact that the weight must be kept raised from the ground during the performance of the various exercises, thus involving a considerable and additional effort from the user.

[0012] Another disadvantage of the known equipment is that the physical movements that can be performed by the user while using the weight are limited due to the mass of the weight and due to the need to keep the latter raised from the ground.

[0013] Said prior art documents and known equipment do not comprise nor render obviously deducible the combination of features which are comprised in the principal claim of the present invention.

[0014] An object of the present invention is to propose a training equipment comprising a weight that remains autonomously raised from the ground during use.

[0015] Another object is to propose a training equipment comprising means, intended for the movement of the weight, the use of which requires strength and motor coordination of the user.

[0016] A further object is to propose an equipment that allows the user to perform a great variety of physical movements and to train in a large number of different exercises.

[0017] The characteristics of the invention are highlighted below with particular reference to the accompanying drawings in which:

- Figure 1 illustrates a perspective view of the training equipment object of the present invention;
- Figures 2-4 illustrate perspective views of respective variants of the equipment of Figure 1;
- Figure 5 illustrates a section view of a blade of the grasp means of the equipment of Figure 1;
- Figure 6 illustrates a perspective and partially sectioned view of the blade of Figure 5;
- Figure 7 illustrates an enlarged perspective view of the weight of the equipment of Figure 1;
- Figure 8 illustrates a partially exploded section view of the weight of Figure 7;
- Figure 9 illustrates an enlarged perspective view of the grasp means of the equipment of Figure 1;
- Figure 10 illustrates an enlarged perspective view of the equipment of Figure 4;
- Figure 11 illustrates a partial and enlarged perspective view of a variant of the grasp means of Figure 9;
- Figure 12 illustrates an enlarged perspective view of a variant of the weight of Figure 7.

[0018] With reference to Figures 1-12, numeral 1 indicates the training equipment object of the present invention, which comprises:

- a weight 2;
- a connection means 3 constrained to the weight 2;
- a suspension means 4 of the weight 2, secured at

an end to the connection means 3 and at another end to a support element 100;

- a grasp means 5 which interacts with the weight 2 for the movement thereof by a user in correspondence with a use condition U of the equipment 1.

[0019] The support element 100 is for example a ceiling or a fixed beam above the weight 2; therefore, the suspension means 4 keeps the weight 2 suspended and free to oscillate in the use condition U.

[0020] The user can train by pushing and braking the weight 2 by means of the gripping means 5.

[0021] The weight 2 is preferably made up of an external shell 6 of an almost spherical shape, of variable size similar to that of the usual sports balls or medicine balls, made of rigid or semi-rigid material, for example metal or polymer, and of variable thickness.

[0022] The external shell 6 forms an empty internal volume 7, i.e. filled with air, or housing a predetermined mass 8 of solid and/or fluidic material or having a fluidic behavior, for example water or other liquid, sand, metal or rubber balls, rubber chips, or the like.

[0023] The mass 8 is preferably left free in the internal volume 7, filling it only partially, so that during the movement of the weight 2 the center of mass of the latter changes, making the movements of the weight itself unpredictable for the user.

[0024] One or more openings 9, preferably two, obtained through the external shell 6 put the internal volume 7 in flow communication with the outside of the weight 2, allowing to modify the quantity and type of the mass 8.

[0025] Each opening 9 is closed by a respective closing means 9', which is for example a cap fastened to its respective opening by screwing or interference.

[0026] In a variant thereof, not illustrated, the internal volume 7 is completely filled with the mass 8, for example the weight 2 is a full sphere of almost uniform density. Alternatively, the mass 8 does not fill the internal volume 7 completely, but it is solid and firmly fixed inside the latter.

[0027] The connection means 3 is preferably metallic, for example made of steel, in order to offer greater strength to the stresses undergone by the weight 2 during its use U, and it has a loop 71 externally protruding or enclosed within the external surface of the weight 2 to which the suspension means 4 is fixed.

[0028] The connection means 3 is preferably fixed to the external shell 6 of the weight 2, or alternatively it is fixed to a closing means 9' and then via the latter it is fastened to the weight 2 in correspondence with an opening 9.

[0029] In the preferred embodiment, the suspension means 4 comprises a cable which is flexible, preferably a rope or band of synthetic material and of adjustable length, or rigid, for example a metal rod, or an elastic cord, or a spring, or the like. The suspension means 4 is tied directly to the loop 71 of the connection means 3 or it is fixed thereto in an equivalent way, for example by

means of a carabiner.

[0030] The oscillation period and the trajectory of the center of mass of the weight 2 are essentially determined by the thrust provided thereto by the user, by the length of the suspension means 4, and by the arrangement and nature of the mass 8 in the internal volume 7.

[0031] By adjusting the length of the suspension means 4 and the quantity and nature of the mass 8, it is possible to vary the amount of effort and the type of physical movement required by the user to push and brake the weight 2.

[0032] The grasp means 5 by means of which the user moves the weight 2 comprises at least a blade 10 with an almost spoon-like shape.

[0033] The blade 10 has a distal end 13, a proximal end 14 opposite the distal end 13, a convex rear surface 11b and a front surface 11a defining a concavity 15 almost complementary to at least a portion of the weight 2 and assigned to partially accommodate the weight 2 for its movement during the use U of the equipment 1. The blade 10 is shaped such that its front projection is almost "pear-shaped", being wider in correspondence with two opposite side portions 12 and narrower at the distal 13 and proximal 14 ends, with the segment joining them being almost orthogonal to the segment joining the side portions 12.

[0034] The distal end 13 is so defined because it is assigned to remain in a distal position with respect to the user in the use condition U. The proximal end 14, on the contrary, has an attachment 14' on the rear surface 11b by means of which the user can maneuver the blade 10, directly or with the aid of a handle means fixed to said attachment 14' as specified hereinafter.

[0035] The proximal end 14 of the blade 10 extends frontally for a better and more enveloping grip on the weight 2.

[0036] The radius of curvature of the concavity 15 is similar to the radius of the weight 2 at its proximal end 14 and progressively increases near the distal end 13. The concavity 15 is thus at least partially complementary to a portion of the weight 2. The particular conformation of the concavity 15 is such that, in correspondence with the use condition U, the proximal end 14 provides a grip on the weight 2 to restrain its oscillation and move it, while the smoothening of the curvature of the concavity 15 in the distal direction towards the distal end 13 allows to accelerate the weight 2 for throwing it.

[0037] The blade 10 is made of a rigid and light material, for example aluminum, plastic, fiberglass, or carbon fiber based.

[0038] Preferably, the blade 10 is provided with an internal cavity 22 extending between the front surface 11a and the rear surface 11b. The internal cavity 22 has a volume which is filled or is assigned to be filled with a material 23 which is fluidic and/or shows a fluidic behavior. Said material 23 is for example water or other liquid, or is made up of sand, marbles, grains or other particles. The material 23 fills the internal cavity 22 only partially,

i.e. it occupies a volume which is less than the volume of the internal cavity 22, in order to provide the blade 10 with a center of gravity which varies almost randomly in correspondence with the use condition U, making the blade 10 unpredictably unstable when moved, and thus forcing the user to exert greater efforts, both in terms of strength and coordination, in governing the grasp means 5 for the movement of the weight 2.

[0039] In a variant thereof, the internal cavity 22 can be filled almost completely with the material 23. In this case the fluidic material 23 acts as a ballast of the grasp means 5, without making the blade 10 unstable.

[0040] To increase the strength of the blade 10, this is equipped with a strengthening spine 72, such as for example a protruding ribbing, which connects the midpoints of the distal 13 and proximal 14 ends along the rear surface 11b. Secondary branches, not illustrated, can originate from said ribbing 72 for a further strengthening effect.

[0041] Almost in the middle of the strengthening spine 72 on the rear surface 11b, the blade 10 has a hooking means 16 with an eyelet to which a resistance element 17 can be fixed in the use condition U, assigned to increase the effort required to the user for the interaction with the weight 2 by means of the blade 10.

[0042] The resistance element 17 preferably comprises an elastic element, such as for example an elastic cord or a spring, having a first end constrained to the hooking means 16, directly or by means of a carabiner, and a second end constrained to a locking element 101 which is fixed with respect to the support element 100.

[0043] Said locking element 101 is for example a wall or a floor.

[0044] Figure 3 illustrates a variant of the equipment 1 in which the resistance element 17 consists of a weight body 25, possibly similar or identical to the weight 2, constrained to the hooking means 16 of the respective blade 10 by means of an anchor means 18, which is for example a rope, or a cable, or a chain, or the like. This weight body 25 is free to oscillate during the movements of the blade 10, randomly modifying the center of gravity thereof, thus making possible for the user to perform exercises of greater difficulty.

[0045] The blade 10 also has two slots 19, each made in a respective side portion 12, assigned to lock a fixing means 20 for a load 21 to the blade itself in a further variant of the equipment 1, illustrated in Figure 11.

[0046] The load 21 is preferably a ball or other body whose size is similar to that of the weight 2 and of variable mass.

[0047] The fastening means 20 is, for example, a double ring strip, with a first ring which presses on a first meridian of the load 21 keeping the latter in contact with the front surface 11a of the blade 10, crosses the slots 19 and closes hook-and-loop on the rear surface 11b, and with a second ring that wraps around a second meridian of the load 21 orthogonal to the first one. The two rings are mutually locked or lockable in correspondence

with their two intersections.

[0048] Further slots 19 are optionally made in the blade 10 if the load 21 needs to be fixed more firmly to the blade 10 itself, for example by means of a fixing means 20 comprising several strips.

[0049] In the preferred embodiment, the grasp means 5 comprises a beam 30 to each end of which a blade 10 is fixed, in correspondence with the attachment 14' of the respective proximal end 14.

[0050] The beam 30 is rigid, for example made of aluminum, with a tubular profile, and is assigned to be grabbed by the user with both hands. The beam 30 can be made in a single body, or it can be divided into two parts to be joined before the use condition U, for example by reciprocal screwing, at a middle joint 31 of the beam 30 itself. The length of the beam 30 ranges from 30 cm to 300 cm depending on the height of the user and on the type of exercise that he wishes to perform.

[0051] In a variant of the preferred embodiment, the grasp means 5 consists of a blade 10 fixed to a handle 40 at the attachment 14' of the proximal end 14 of the blade 10.

[0052] The handle 40 preferably comprises two rigid tubular prongs 41 mutually welded at a respective end to which the blade 10 is fixed, and arranged so that the angle between them is comprised between 5° and 150°, preferably 40°. The prongs 41 have a length comprised between 20 cm and 100 cm, preferably 40 cm.

[0053] A further variant of the preferred embodiment provides that the grasp means 5 consists of a blade 10 fixed to a cylindrical or tubular hilt, with a length comprised between 20 cm and 100 cm, in correspondence with the attachment 14'. The hilt is intended to be grabbed by the user with one or both hands, allowing the user to perform a great variety of exercises and movements particularly suitable for athletic training for specific sports, such as tennis and baseball.

[0054] Optionally, the equipment 1 further comprises one or more sensor means 80 assigned to monitor the training in the use condition U, fixed to the weight 2, for example in correspondence with or inside the closing means 9', and/or to the connection means 3, and/or to the suspension means 4, and/or to the grasp means 5, for example to the blade 10 or to the beam 30.

[0055] The sensor means 80 comprise electronic sensors of the inertial type, for example accelerometers or gyroscopes. Each sensor means 80 measures with a predetermined frequency the temporal evolution of the three-dimensional acceleration of the element to which it is fixed, producing a sequence of digital data; by knowing the mass of the weight 2, it is possible to derive the trend of the force exerted by the user on the weight 2 itself during the use thereof thanks to the known formula force = mass x acceleration. The use of these sensor means 80 therefore allows to monitor training parameters such as the energy consumed by the user, the number and type of movements performed, the duration of the concentric and eccentric phases of the user's muscular

contractions, the amount of force exerted on weight 2, and others.

[0056] The data produced by each sensor means 80 are saved on a respective electronic memory and then extracted and processed at the end of the training, or alternatively they can be transmitted by radiofrequency in real time from the sensor means 80 itself to a central controller for monitoring the training in real time.

[0057] A second embodiment of the equipment 1 provides that the weight 2 has a multilobed shape, preferably with two lobes, with each lobe 2' having a nearly spherical shape and partially mutually compenetrating with the other lobe 2'. The connection means 3 is fixed along the circumference defined by the intersection of the two lobes 2'.

Claims

1. Training equipment comprising:

- at least a weight (2);
- at least a connection means (3) constrained to the weight (2);
- a suspension means (4) of the weight (2), secured at an end to the connection means (3) and at another end to a support element (100), and which keeps the weight (2) suspended and free to oscillate in correspondence of a use condition (U) of the equipment (1);
- a grasp means (5) which interacts with the weight (2) for the movement thereof by a user in the use condition (U);

the equipment (1) being **characterized in that** the grasp means (5) comprises at least one blade (10), having a rear surface (11b) and a front surface (11a), with the front surface (11a) defining a concavity (15) almost complementary to at least a portion of the weight (2).

2. Equipment according to claim 1 **characterized in that** the rear surface (11b) has at least a hooking means (16) for a resistance element (17) assigned to increase the effort required to the user in correspondence of the use condition (U).
3. Equipment according to claim 2 **characterized in that** the resistance element (17) comprises an elastic element, having at least a first end constrained to the hooking means (16) and a second end constrained to a blocking element (101) fixed with respect to the support element (100).
4. Equipment according to claim 2 **characterized in that** the resistance element (17) comprises at least a weight body (25) constrained to the hooking means (16) by an anchor means (18).

5. Equipment according to any one of the previous claims **characterized in that** the at least one blade (10) has at least two slots (19) assigned to block a fixing means (20) of a load (21) to the blade (10).
6. Equipment according to any one of the preceding claims **characterized in that** the at least one blade (10) has an internal cavity (22) assigned to be filled, at least partially, with a material (23) fluidic or showing fluidic behavior.
7. Equipment according to any one of the preceding claims **characterized in that** the grasp means (5) comprises a beam (30) to each end of which a blade (10) is fixed, on the side of a proximal end (14) thereof.
8. Equipment according to any of claims 1-6 **characterized in that** the grasp means (5) comprises a handle (40) to which the blade (10) is fixed on the side of a proximal end (14) thereof.
9. Equipment according to claim 8 **characterized in that** the handle (40) comprises two prongs (41) arranged at an angle comprised between 5° and 150°, preferably 40°.
10. Equipment according to any one of the preceding claims **characterized in that** the weight (2) has nearly spherical shape.
11. Equipment according to any one of claims 1-9 **characterized in that** the weight (2) has multilobed shape, with each lobe (2') nearly spherical and partially mutually compenetrating with at least another lobe (2').
12. Equipment according to any one of the preceding claims **characterized in that** the suspension means (4) comprises a flexible or rigid cable.
13. Equipment according to any one of the preceding claims **characterized in that** it further comprises sensor means (80) of the inertial type for training monitoring which are fixed to the weight (2) and/or to the connection means (3) and/or to the suspension means (4) and/or to the grasp means (5).
14. Equipment according to any one of the preceding claims **characterized in that** the weight (2) has an internal volume (7) which is empty or filled, partially or completely, with a mass (8) solid and/or fluidic or showing fluidic behavior.

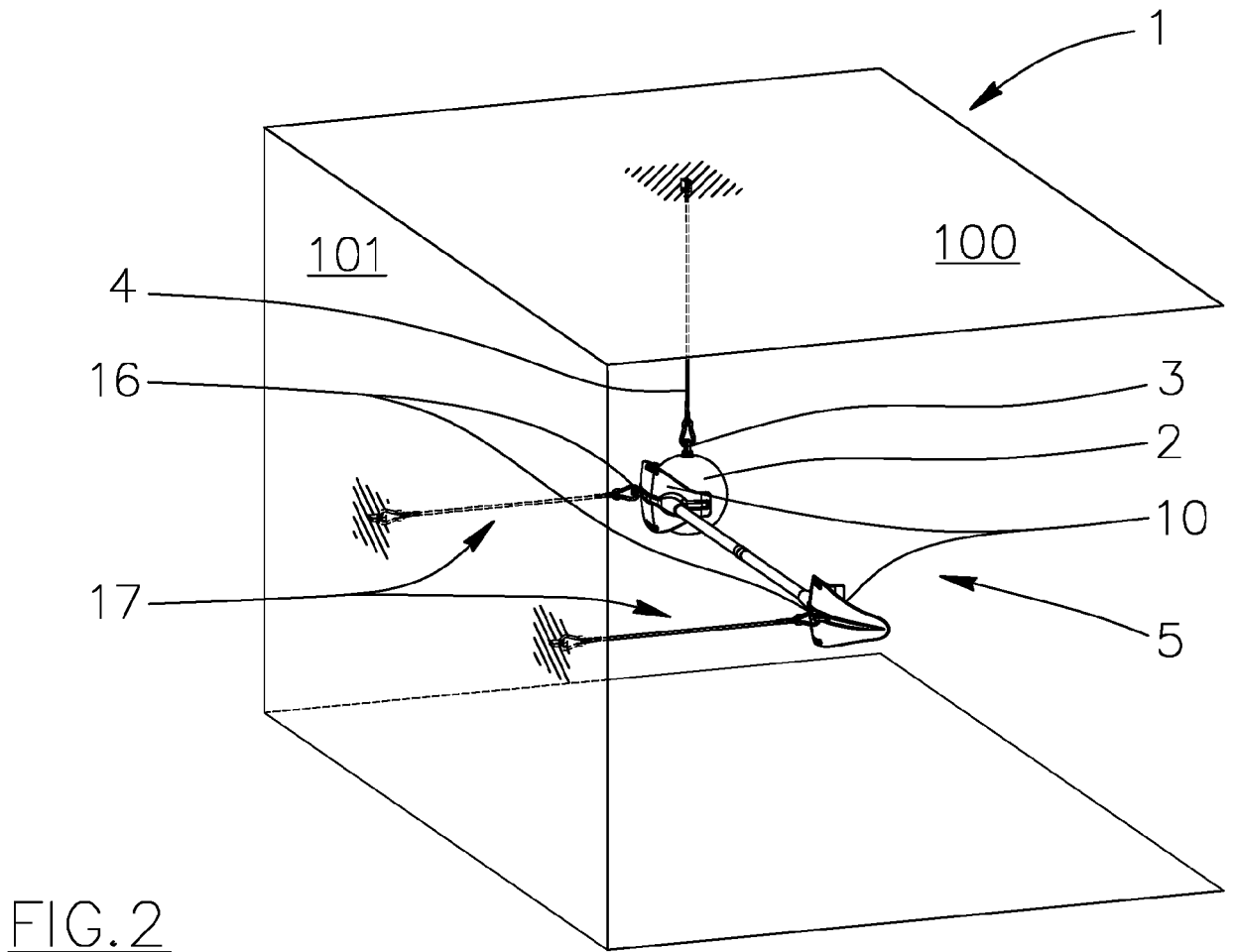
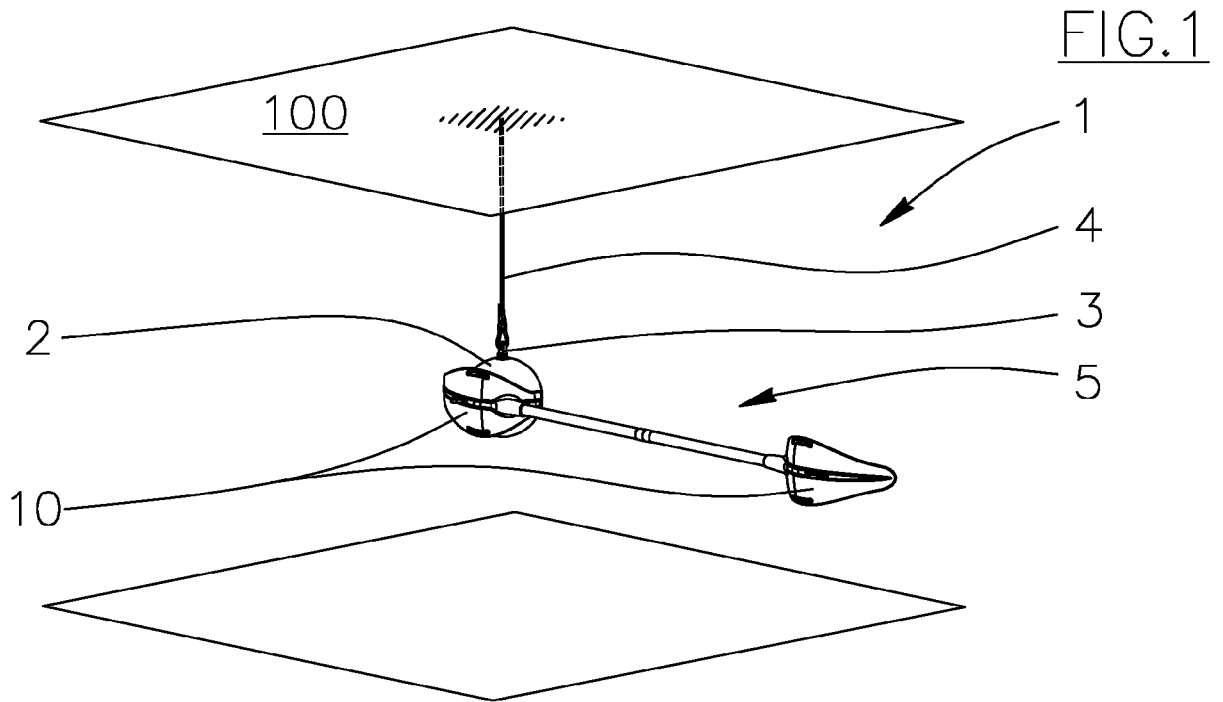


FIG.3

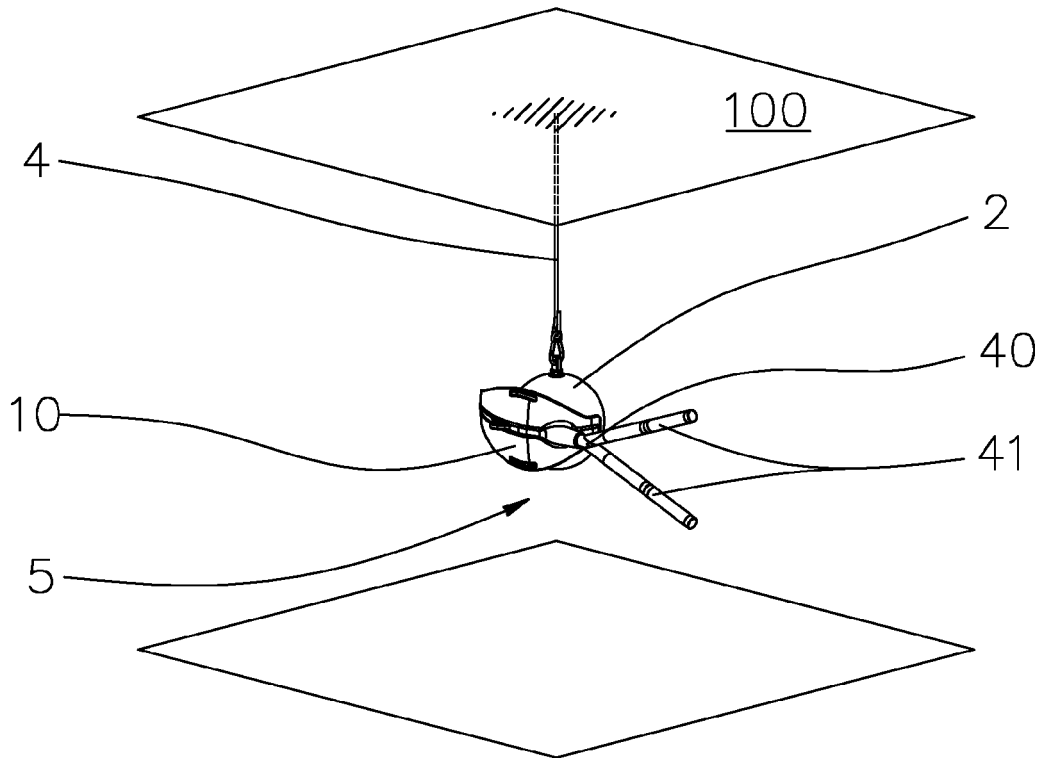
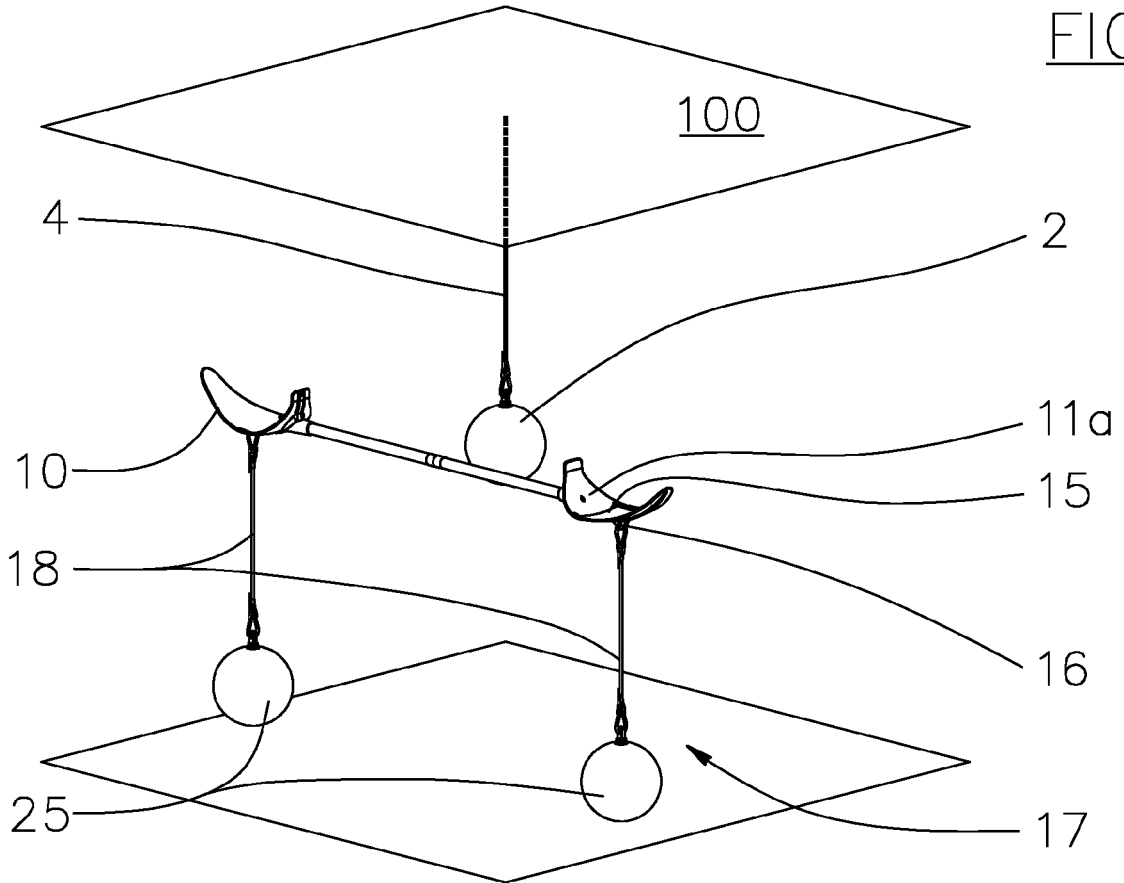


FIG.4

FIG.5

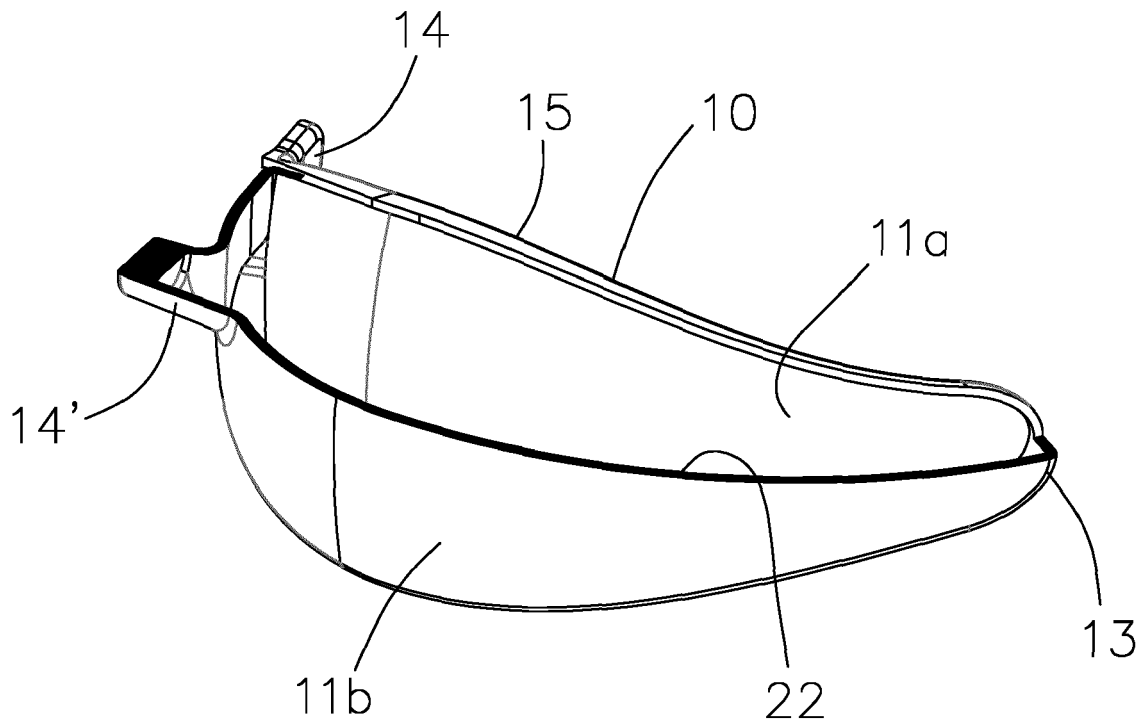
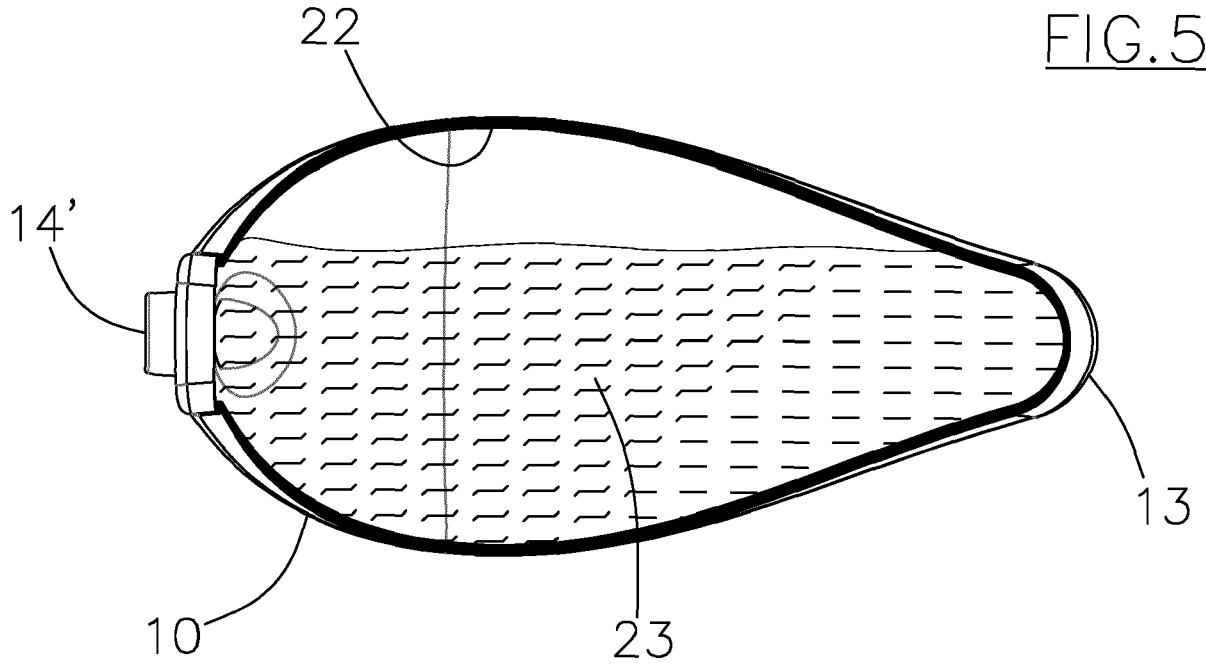


FIG.6

FIG. 7

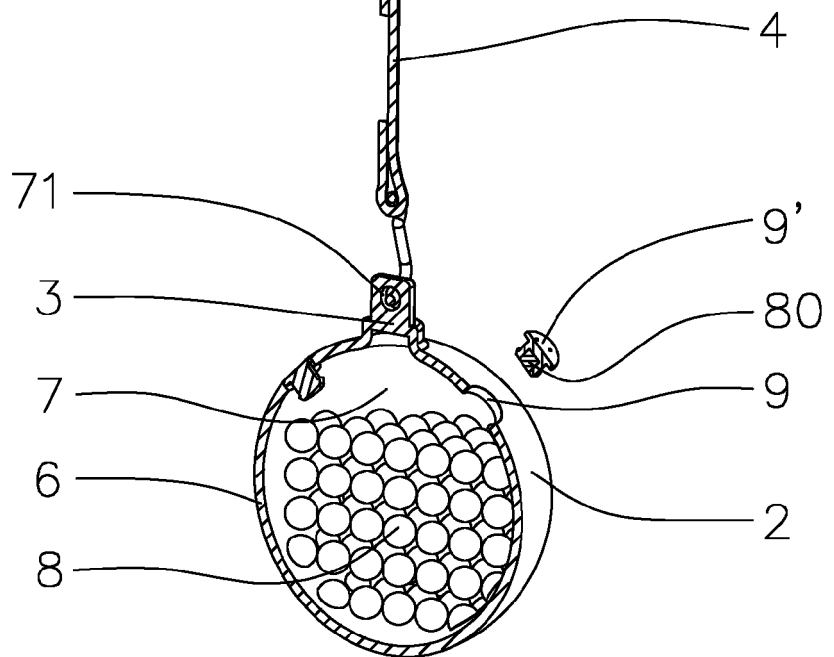
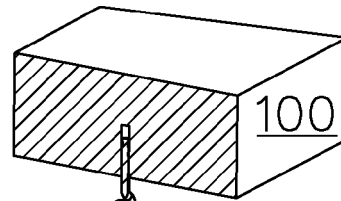
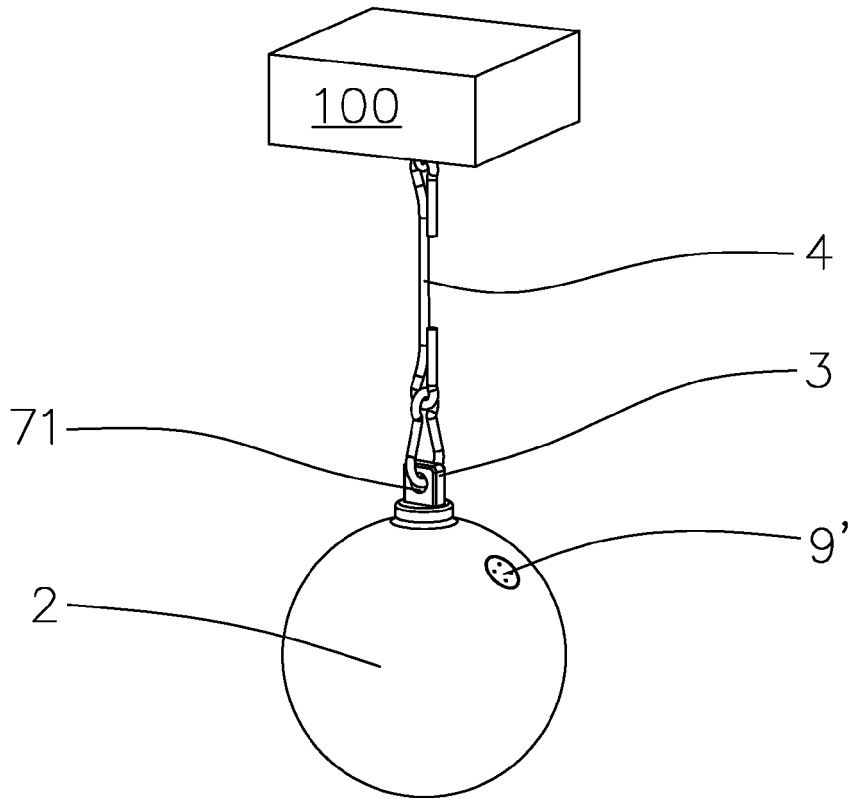


FIG. 8

FIG. 9

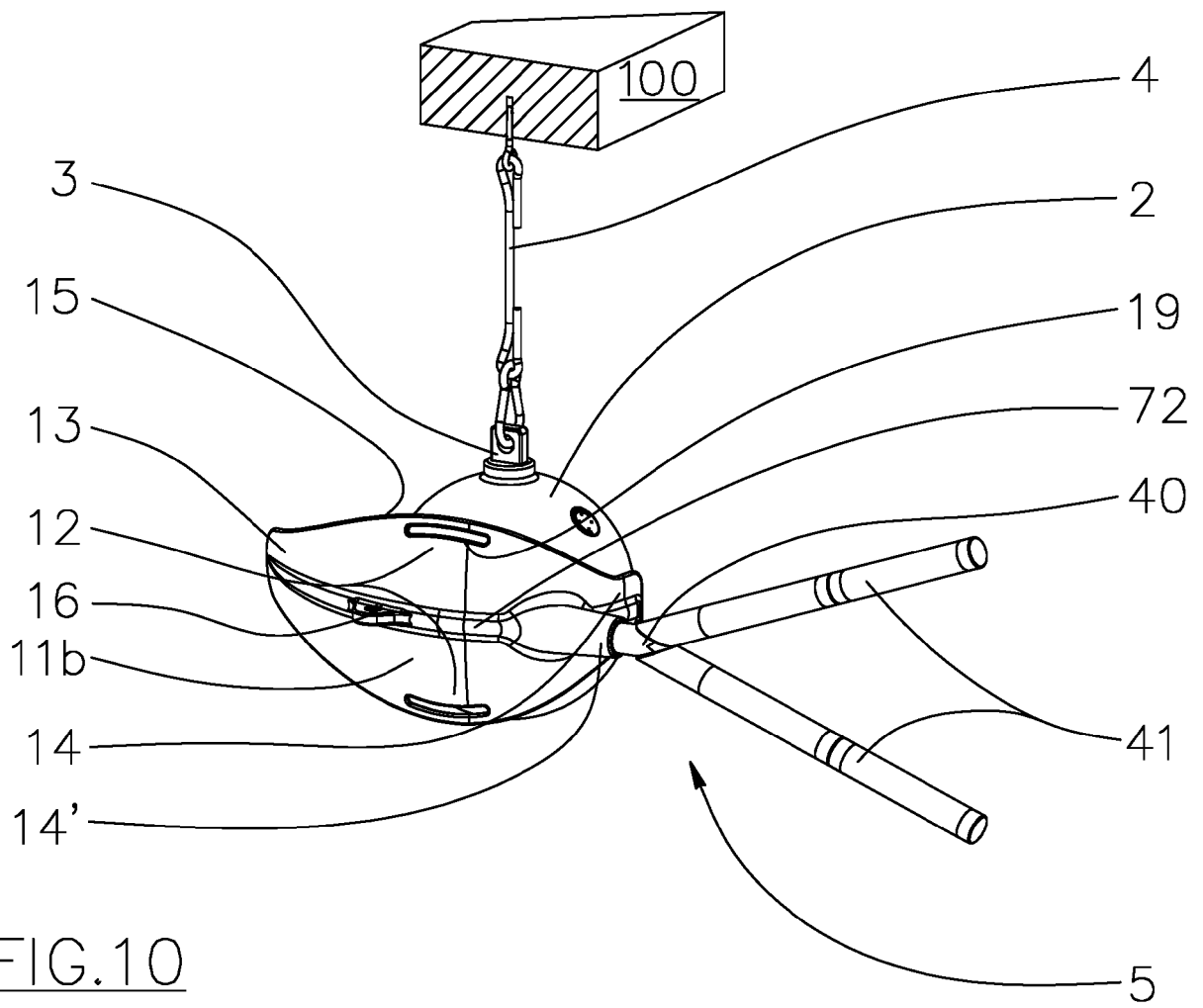
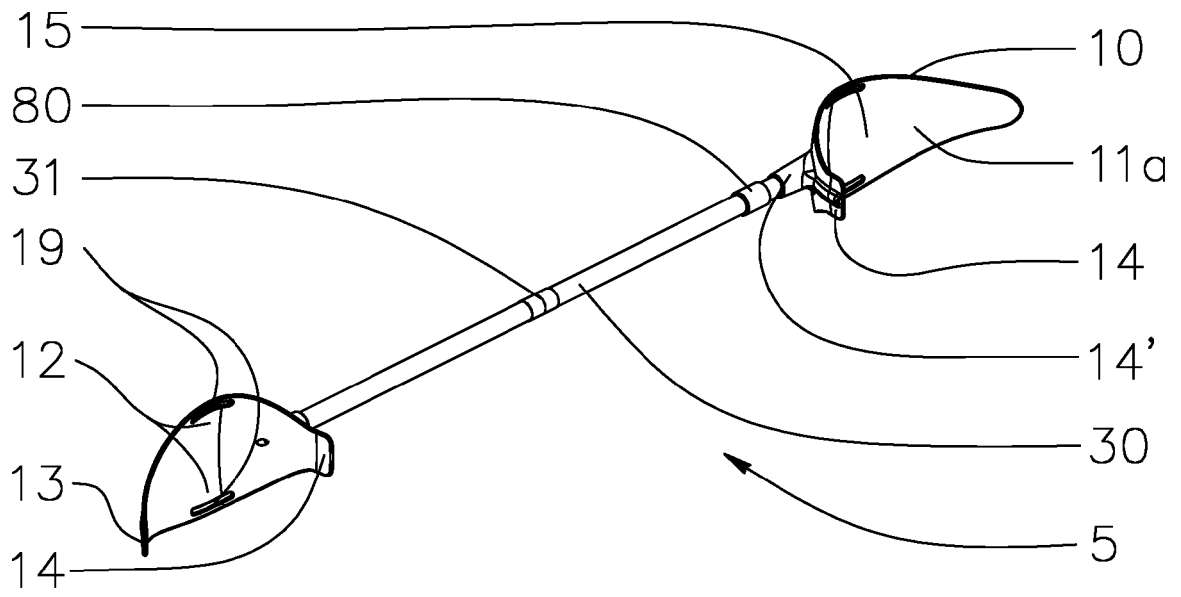


FIG. 10

FIG.11

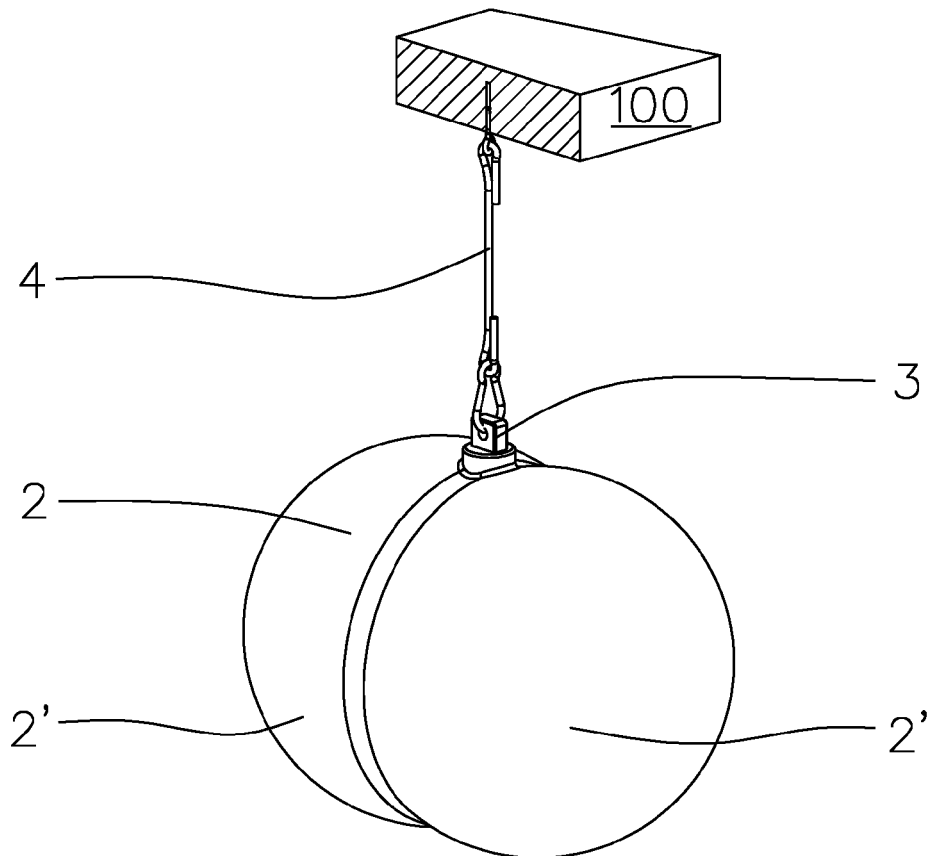
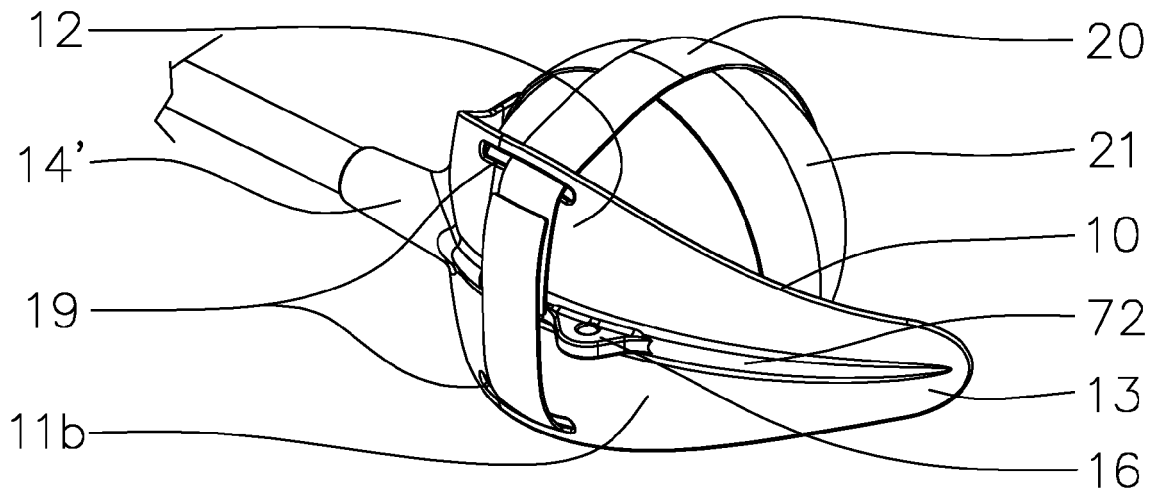


FIG.12



EUROPEAN SEARCH REPORT

Application Number

EP 22 20 6678

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DOCUMENTS CONSIDERED TO BE RELEVANT

10

15

20

25

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			A63B

The present search report has been drawn up for all claims

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Place of search Munich	Date of completion of the search 28 March 2023	Examiner Borrás González, E
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