



US 20090093352A1

(19) **United States**

(12) **Patent Application Publication**

Krupa

(10) **Pub. No.: US 2009/0093352 A1**

(43) **Pub. Date: Apr. 9, 2009**

(54) **BODY-BUILDING DEVICE SUBSTANTIALLY IN THE FORM OF A "CLOVERLEAF", WHICH PERMITS MUSCULAR WORKING OF THE LOWER AND UPPER LIMBS**

(30) **Foreign Application Priority Data**

Mar. 16, 2006 (FR) 06/02312

Publication Classification

(51) **Int. Cl.**
A63B 21/02 (2006.01)
A63B 23/02 (2006.01)

(52) **U.S. Cl.** 482/122; 482/92

(57) **ABSTRACT**

The present invention relates to a device of the type for building up the upper and lower limbs in particular, which has at least two resistance forces, and preferably three forces. These forces are obtained without adding a supplementary part, and without any particular adjustment. The device has a substantially oval shape (1) and has two lateral extensions (4, 5) of the "ear" type, which, inter alia, allow it to be grasped by a user. This device also comprises two strips (6, 7) which are thinner than those of the other, main strip which forms the assembly of the device (2, 3, 4, 5).

(76) Inventor: **Robert Krupa, Firminy (FR)**

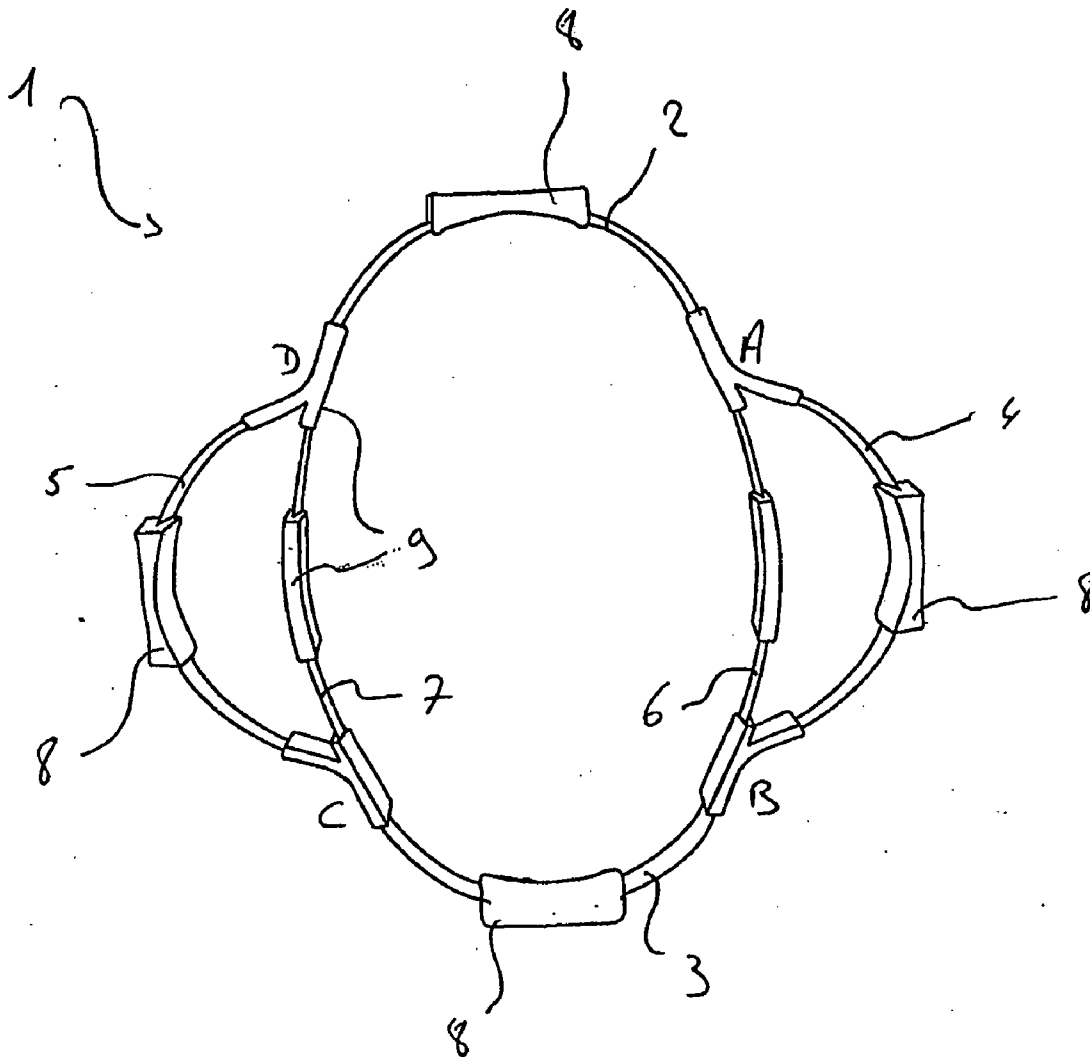
Correspondence Address:
24IP LAW GROUP USA, PLLC
12 E. LAKE DRIVE
ANNAPOLIS, MD 21403 (US)

(21) Appl. No.: **12/293,223**

(22) PCT Filed: **Mar. 15, 2007**

(86) PCT No.: **PCT/IB2007/000635**

§ 371 (c)(1),
(2), (4) Date: **Sep. 16, 2008**



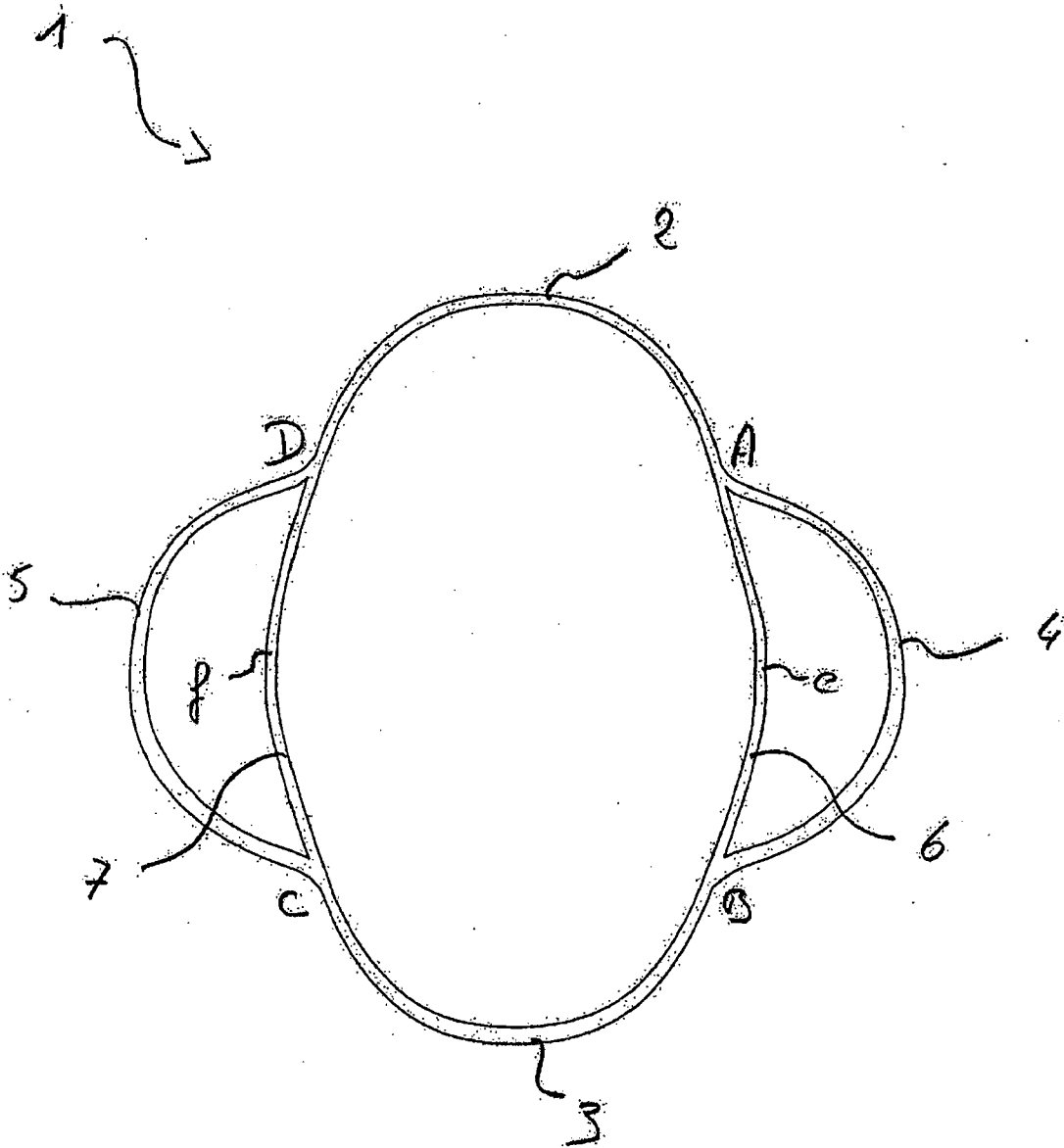


Fig. 1

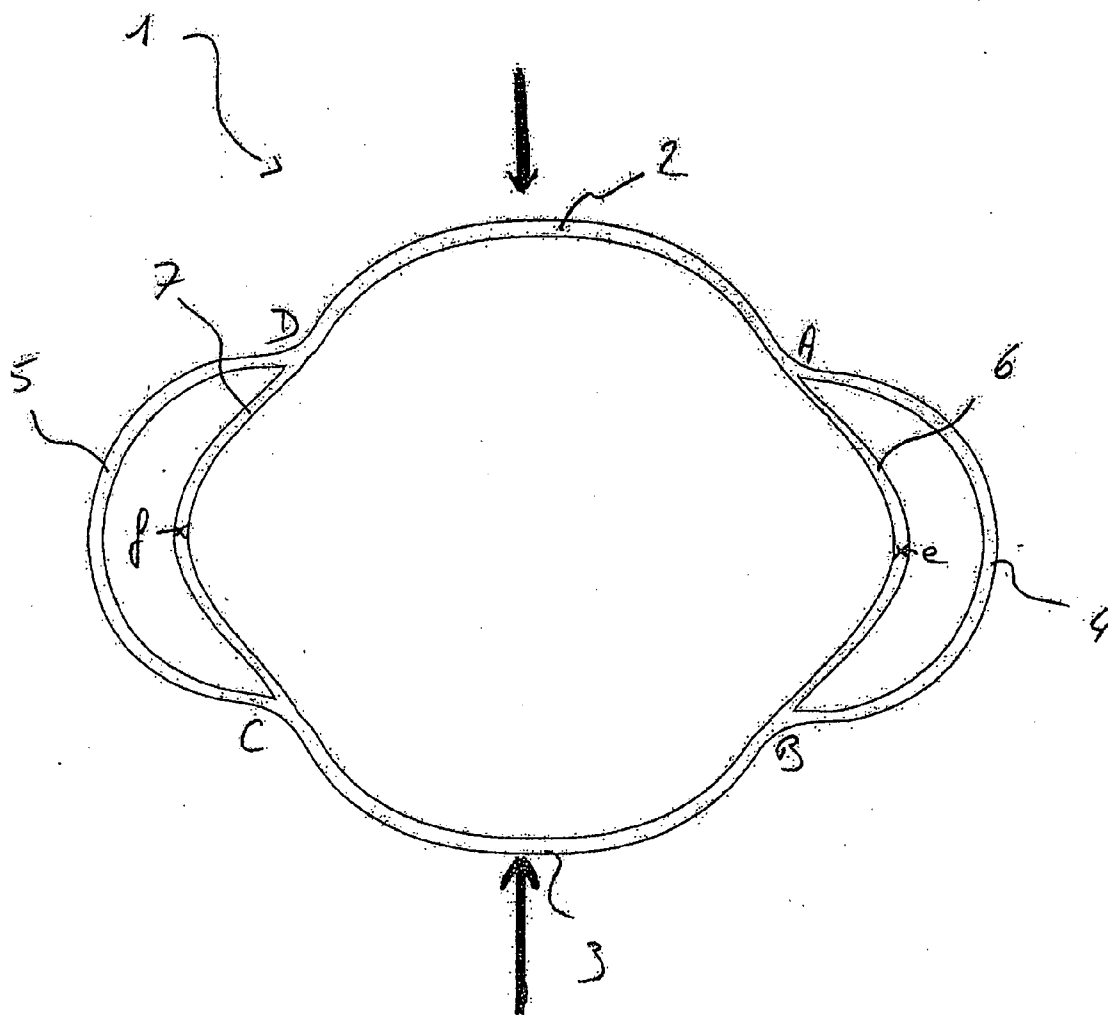


Fig. 2

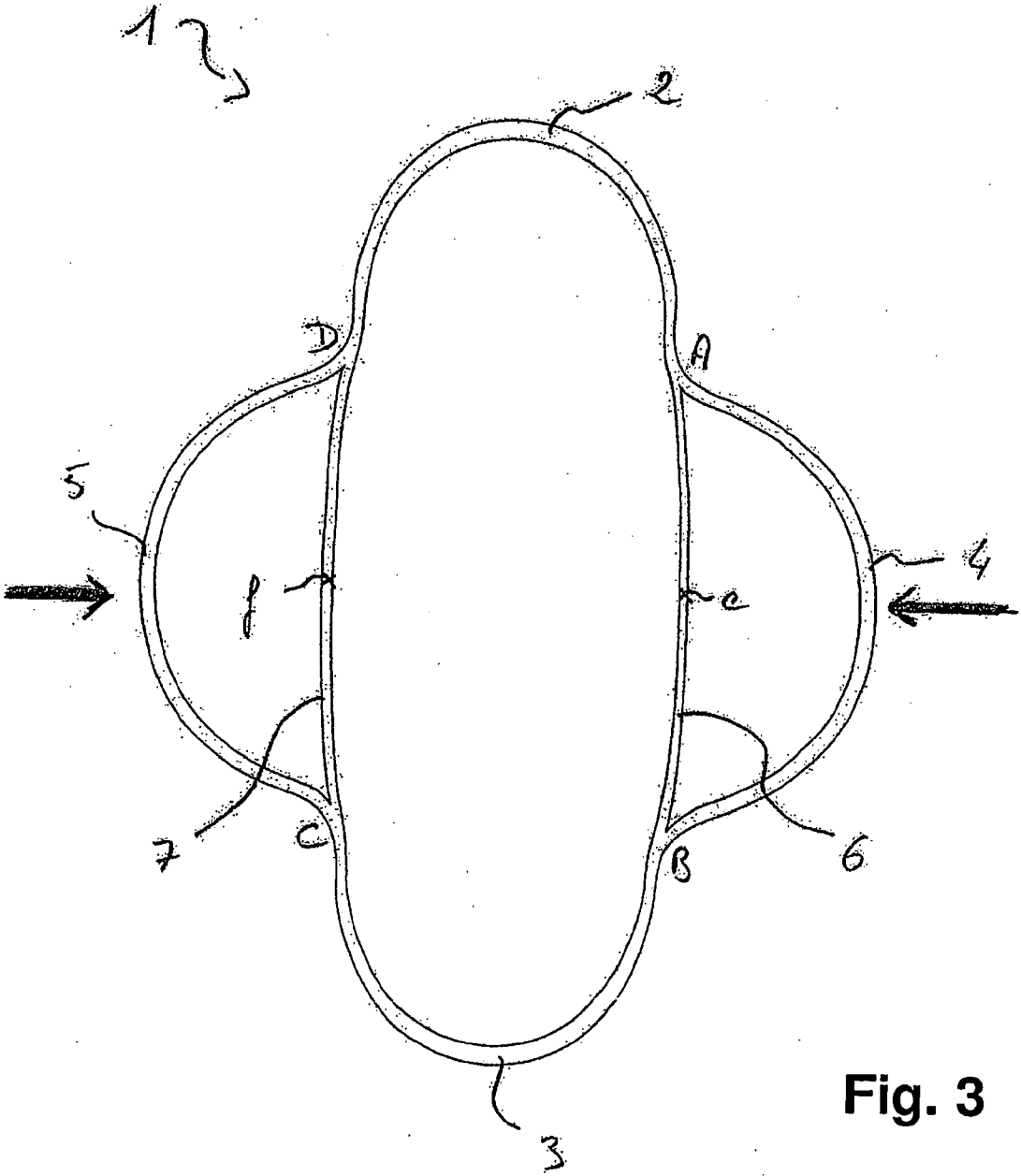


Fig. 3

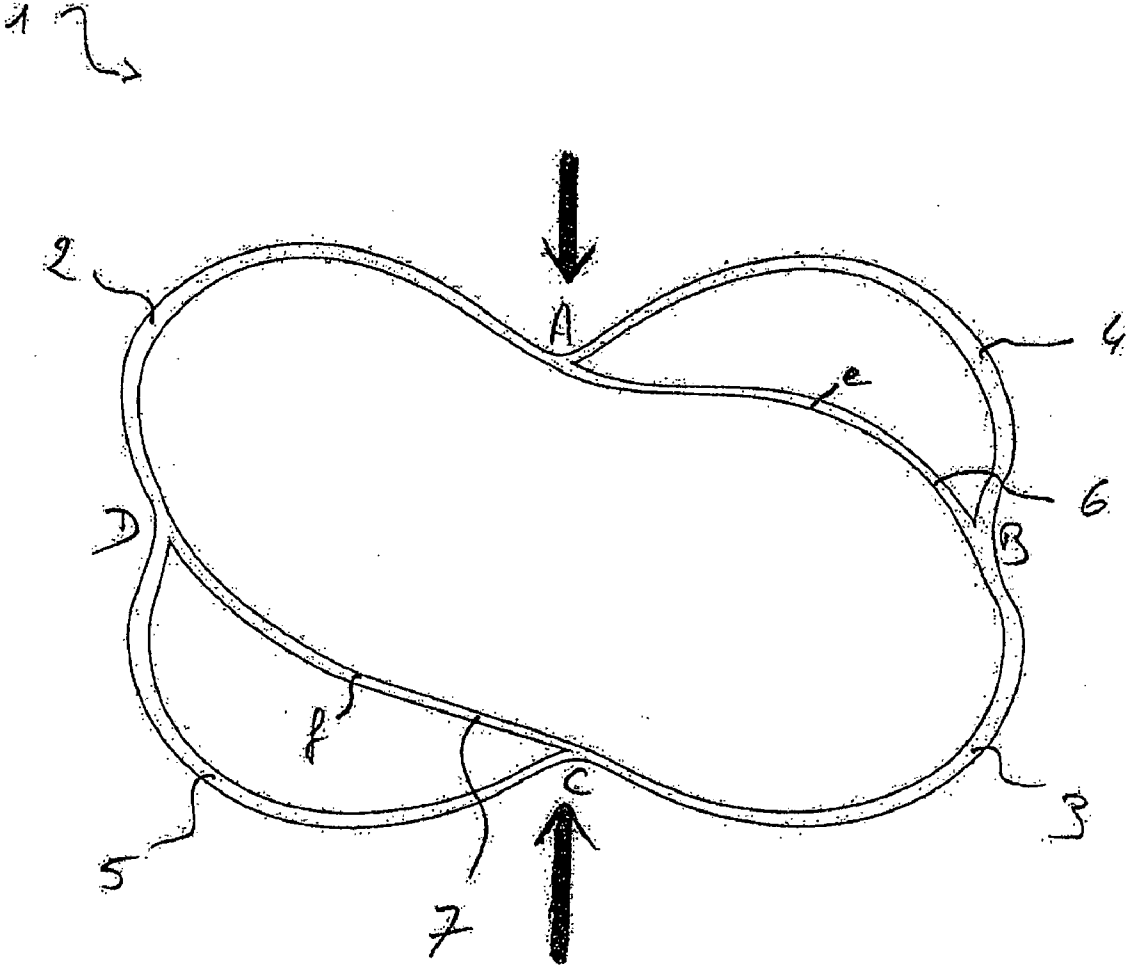


Fig. 4

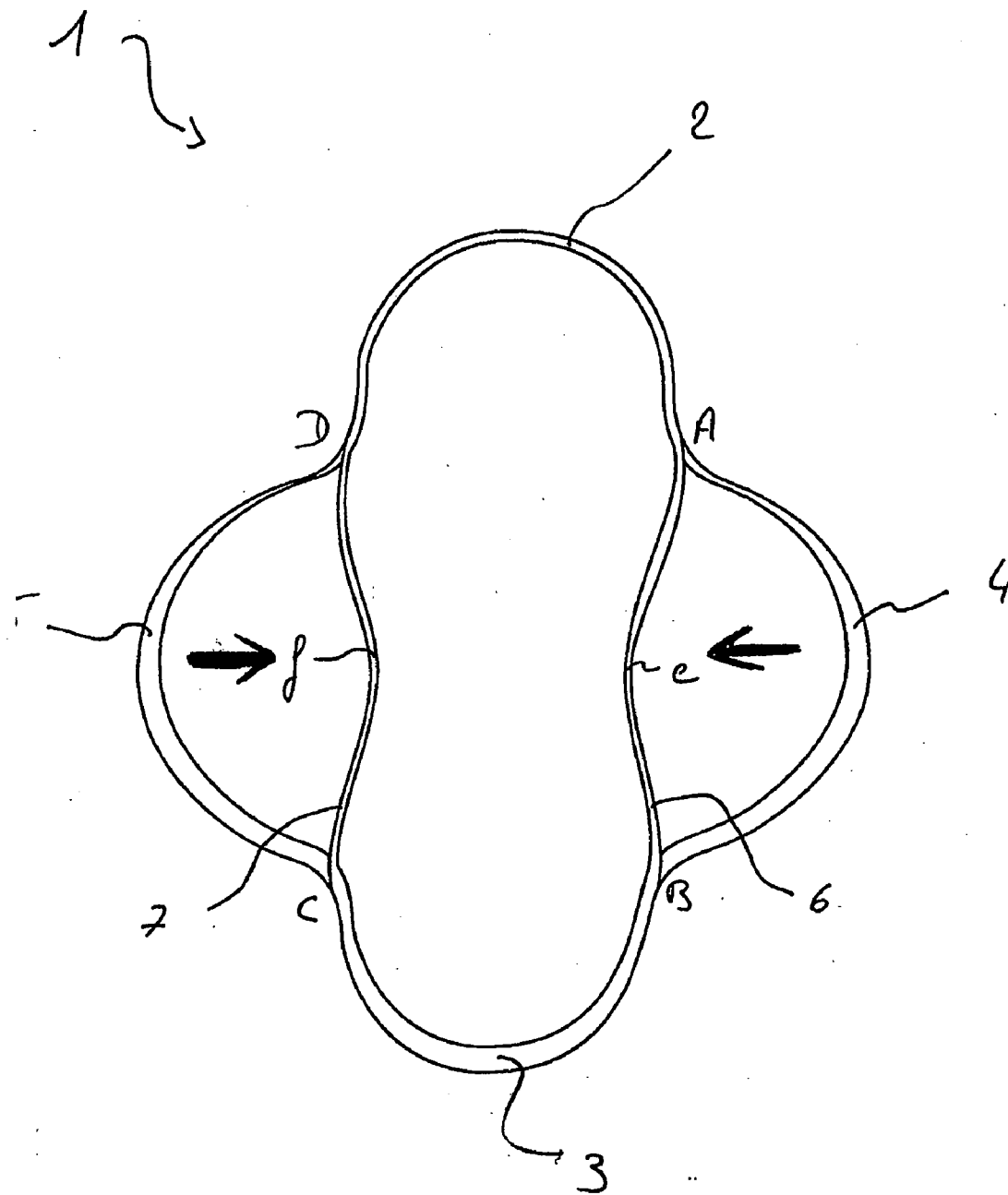


Fig. 5

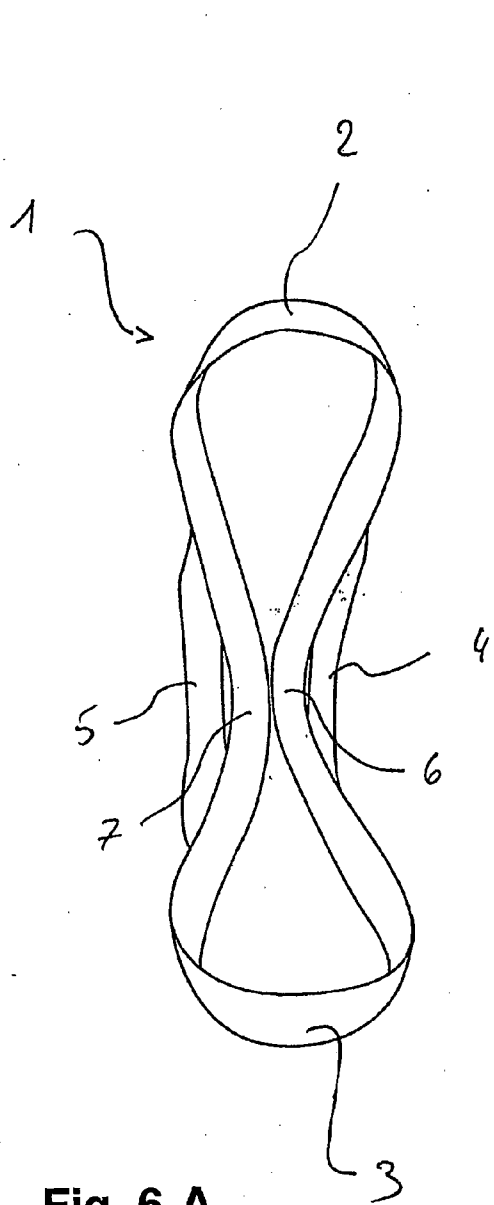


Fig. 6 A

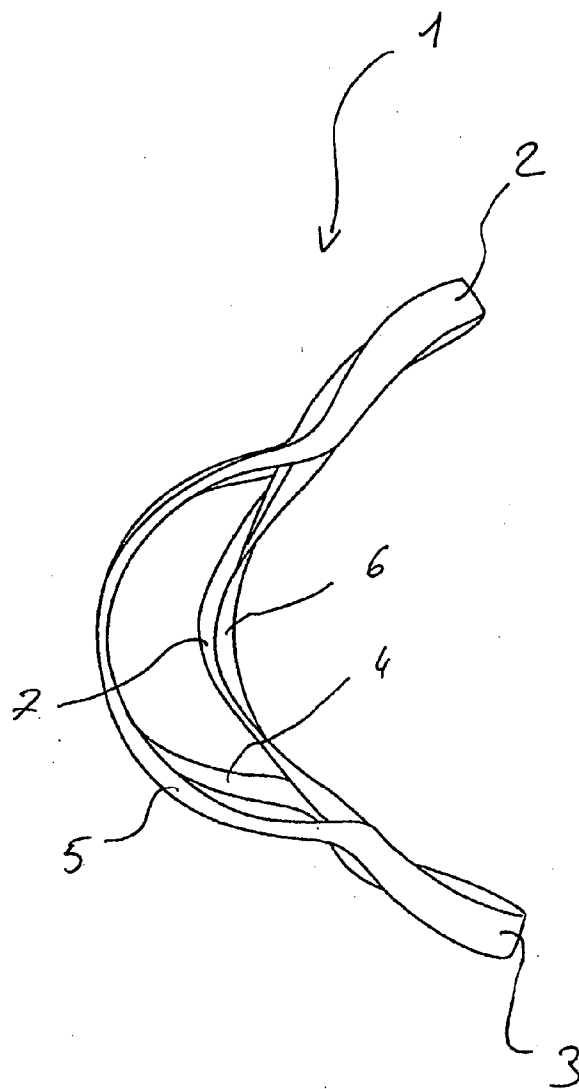


Fig. 6B

Fig. 6

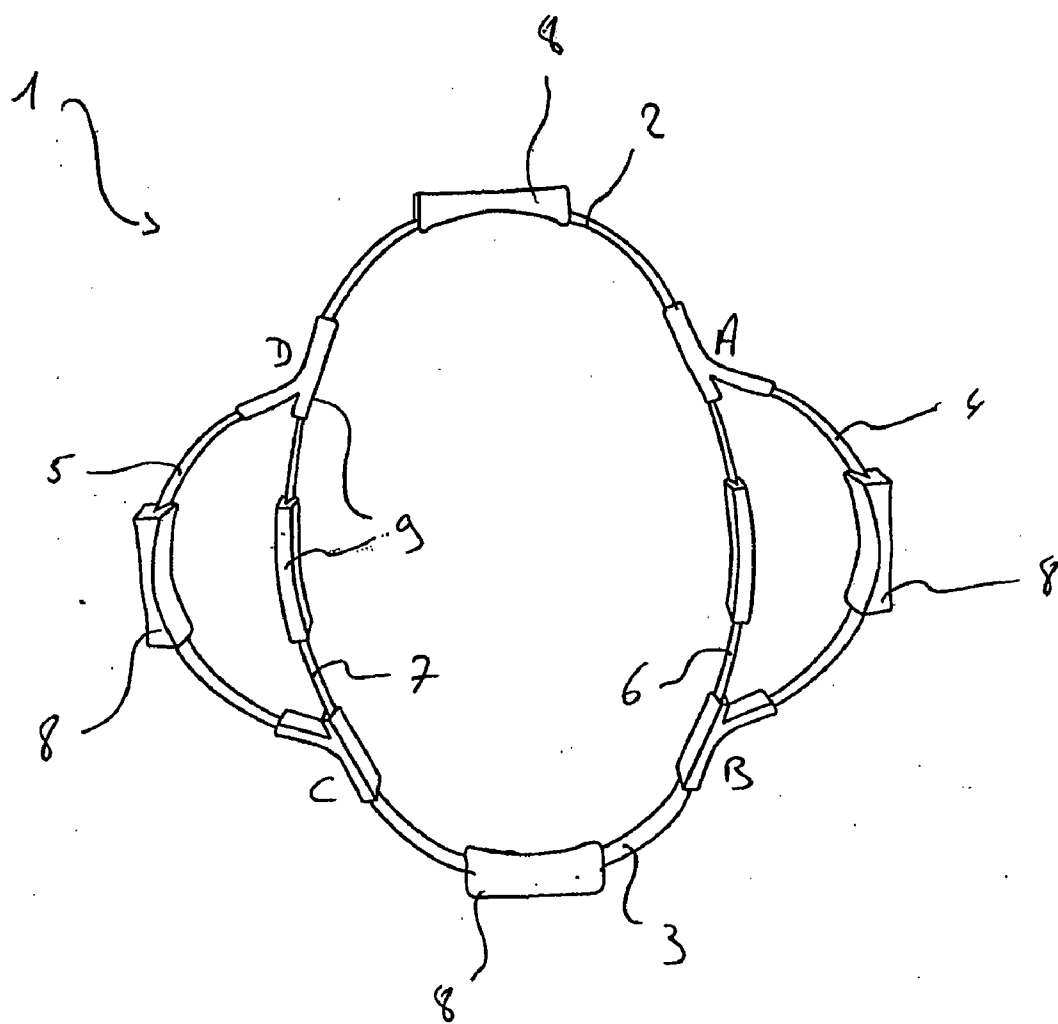


Fig. 7

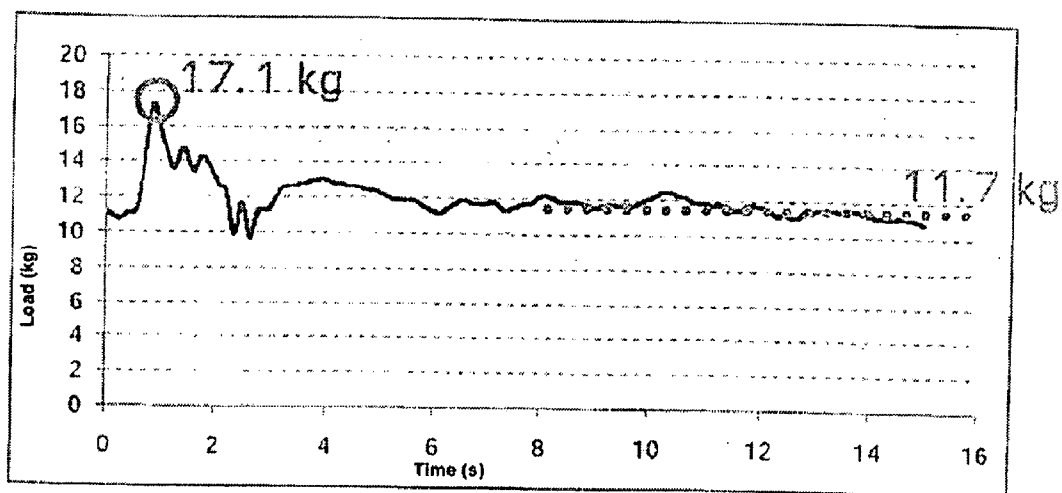


Fig. 8

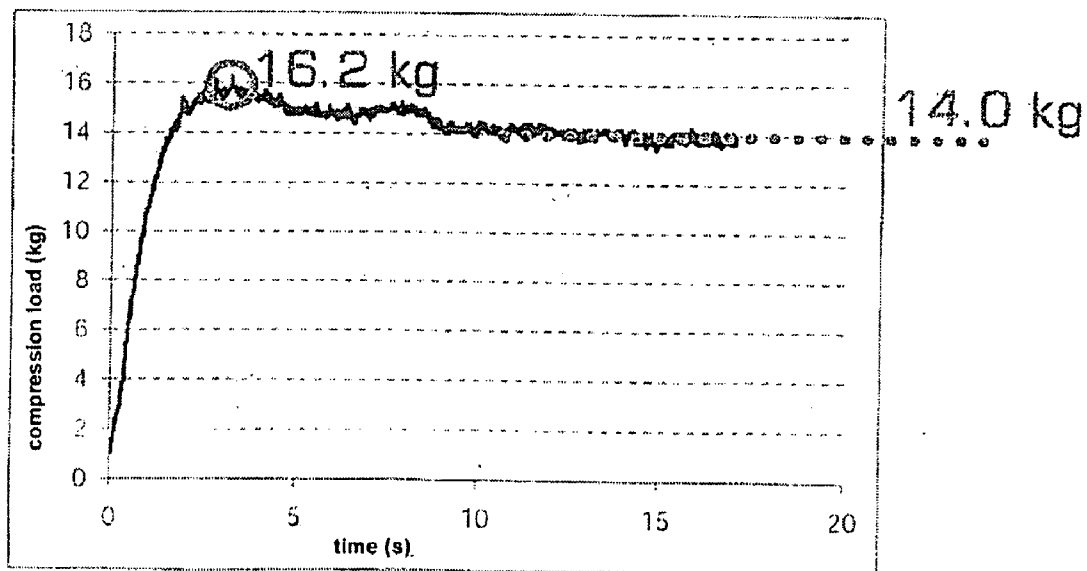


Fig. 9

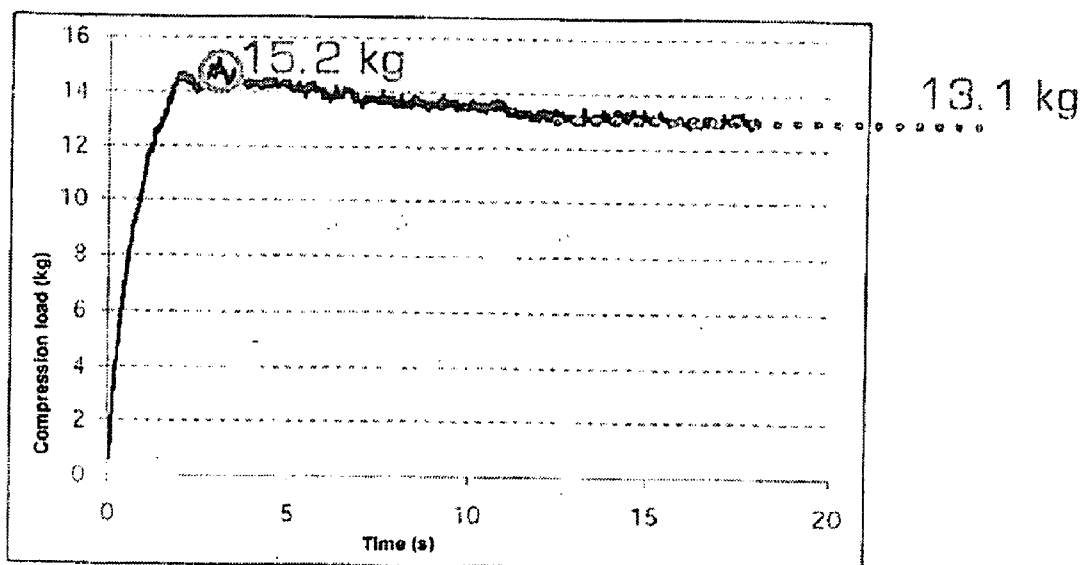


Fig. 10

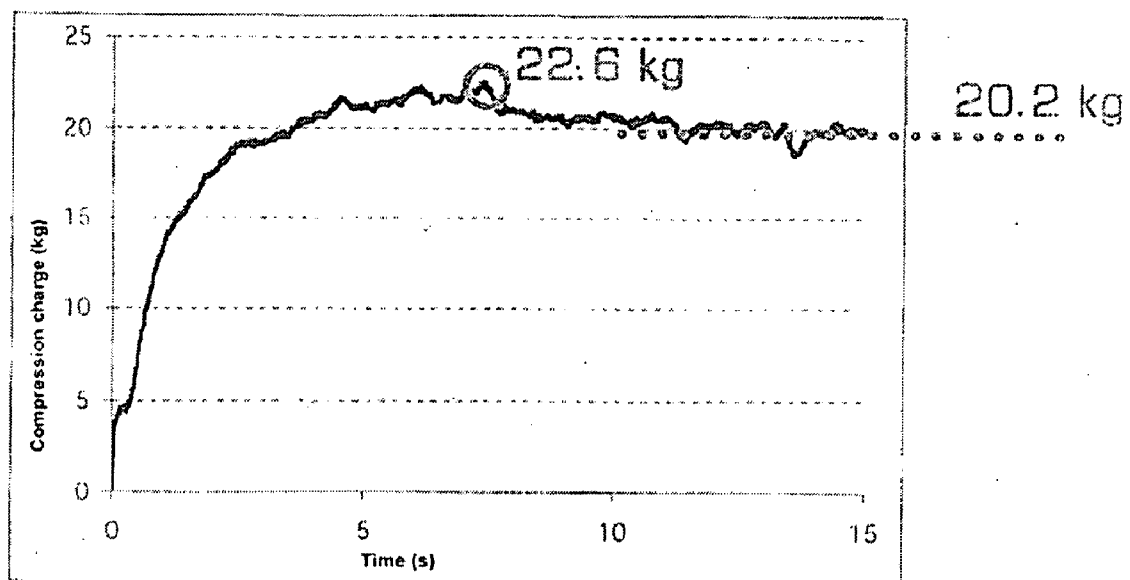


Fig. 11

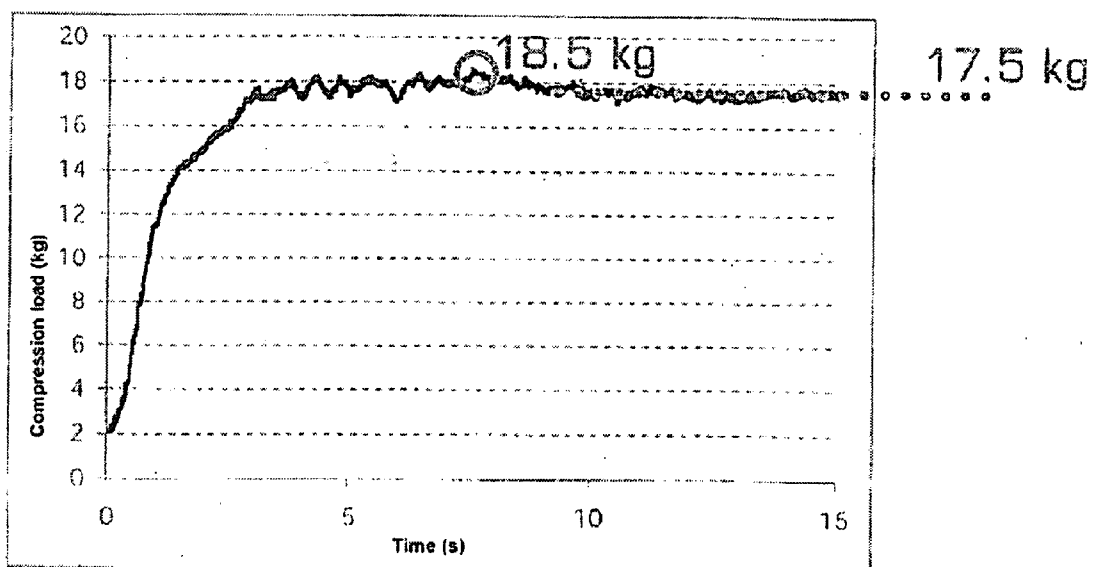


Fig.12

BODY-BUILDING DEVICE SUBSTANTIALLY IN THE FORM OF A "CLOVERLEAF", WHICH PERMITS MUSCULAR WORKING OF THE LOWER AND UPPER LIMBS

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to the technical field of body-building devices in the form of an ellipse or oval, which inter alia permit muscular working of the lower and upper limbs.

PRIOR ART

[0002] Devices of the ring or circle type are known, with deformation along a single axis and two directions of a steel or carbon fibre or glass fibre circle. These are devices of the resistance ring type, which substantially make it possible to exercise the lower and upper limbs.

[0003] They make it possible (inter alia by means of the "Pilates" method) to improve muscular performance and to tone the muscles, or simply to improve physical form.

[0004] A disadvantage of these prior devices is that the user can apply only a single type of force, which will always be the same, unless a supplementary resistance means is used (for example a "Sandow" or strap), which requires adjustment.

[0005] Another disadvantage is that they are made of costly materials, and can consist of a plurality of parts (for example two arcs of a circle assembled, handles, "Sandow", etc) which make their production relatively complex and thus increase the cost of production of the equipment.

TECHNICAL PROBLEM POSED

[0006] There is a genuine need to develop a device which permits body building inter alia of the lower and upper limbs, by providing at least two possibilities of force, which can be produced easily and can also be manufactured at a reduced cost.

SUMMARY OF THE INVENTION

[0007] The prevent invention relates to a device of the type for building up the upper and lower limbs in particular, which has at least two resistance forces, and preferably three forces. These forces are obtained without adding a supplementary part, and without any particular adjustment.

DETAILED DESCRIPTION OF THE INVENTION

[0008] The invention thus relates to a device which permits building up of the upper and lower limbs in particular (the pectoral muscles, triceps, abdominal muscles, dorsal muscles and muscles of the legs and thighs, as well as of other groups of muscles, etc).

[0009] FIG. 1 is a view from above of the device according to the present invention, in a position in which it is at rest.

[0010] FIG. 2 is a view of the same device in which a first pressure is applied, giving rise to a low resistance force.

[0011] FIG. 3 is a view of the same device to which a second pressure is applied, giving rise to a very strong resistance force.

[0012] FIG. 4 is a view of the same device, to which a third pressure is applied, giving rise to an intermediate resistance force.

[0013] FIG. 5 is a view of the same device to which a fourth pressure is applied, giving rise to a very strong resistance force.

[0014] FIG. 6, which consists of FIGS. 6A (front view) and 6B (profile view) shows the device according to the invention to which a pressure is applied which gives rise to a fifth resistance force known as a "torsion" force.

[0015] FIG. 7 is a view of the said device according to the preferred embodiment.

[0016] FIG. 8 is a graph representing the development of the load over a period of time, during a bench-press exercise.

[0017] FIG. 9 is a graph representing the development of the compression load over a period of time, of the device according to the invention, when pressure is applied to it at the level of the strips (2 and 3) in order to obtain a low resistance force.

[0018] FIG. 10 is a graph representing the development of the compression load over a period of time, of the device according to the invention, when pressure is applied to it at the level of the strips (A and C) or (B and D), in order to obtain an intermediate resistance force.

[0019] FIG. 11 is a graph representing the development of the compression load over a period of time, of the device according to the invention, when pressure is applied at the level of the strips (4 and 5) in order to obtain a very strong resistance force.

[0020] FIG. 12 is a graph representing the development of the compression load over a period of time, of the device according to the invention, when pressure is applied at the level of the strips (6 and 7), in order to obtain a strong resistance force.

[0021] The invention relates to a device which has a substantially oval shape (1) with two lateral extensions (4, 5) of the "ear" type, which inter alia allow it to be grasped by a user. This device also comprises two strips (6, 7) which are thinner than the other main strip which forms the assembly of the device (2, 3, 4, 5). These two thin strips are formed on the prolongation of the oval created by the device, and therefore pass through the said extensions, and connect the points A and B/C and D.

[0022] Because of the oval shape of this device, all the curved parts which are formed on it are slightly curved towards the exterior. The radius of the main strips and of the lateral extensions of the "ear" type is preferably 120 mm, but it will be appreciated that this dimension can be adapted to the requirements of persons skilled in the art.

[0023] This device is preferably a part made in a single piece of injected plastic (PA 6 (polyamide nylon 6)). Technological progress which has been made in plastic materials makes it possible to obtain materials with a relatively substantial memory effect, but in order to accentuate the memory effect it is possible to place a steel strip inside the plastic, also in order to provide greater resistance.

[0024] In addition, the composite materials have the following characteristics: good resistance to traction, flexure capacity, good resistance to impacts, high mechanical strength, rigidity, hardness, good resistance to fatigue and wear; or use can be made of any other material accessible to persons skilled in the art, which makes it possible to produce a device of this type in a single piece, with high strength and a substantial memory effect, so that the part can regain its initial form irrespective of the deformation applied, and that

the device can be used regularly over a long period of time, still providing optimal qualities of use throughout the duration of its use.

[0025] In order to make the assembly stronger, it is possible to add elements of the reinforcement type (9) in the locations where the tensions applied are strongest, i.e. substantially at the level of the top points of curvature (e, f) and at the level of the joining points of the strips (A, B, C, D).

[0026] The said device has a dimension of approximately 50 cm in diameter. The thickness of the strips of the device is approximately 7 mm for the thick portions (2, 3, 4, 5) and approximately 4 mm for the thinner portions (6, 7).

[0027] According to the preferred embodiment of the said device (FIG. 7), the dimensions are as follows: diameter 51 cm and width of strips 5 cm.

[0028] According to a preferred embodiment, at the level of the tops of the four arcs formed by the main strip of the device (2, 3, 4, 5), i.e. at the level of the upper (2), lateral (4, 5) (extensions of the ear type) and lower (3) parts, it is possible to place an additional comfort moulding (8) made of elastomer (or polyethylene or polyurethane foam), to make it easy to grip and use.

[0029] According to the preferred embodiment (FIG. 7), the device comprises ten elements altogether of the additional comfort moulding type (8) and reinforcement type (9).

[0030] According to another embodiment of the present invention, this additional moulding is preferably ergonomic, in order to improve the use of the device.

[0031] The material used can be of any type accessible to persons skilled in the art, so that it can ensure that the user has a good hand grip and good support at leg level.

[0032] It is possible to exert different resistance forces according to the locations at which the user takes hold of the said device, and therefore according to the locations where the user applies pressure:

[0033] low by taking hold of the device simply at the level of the lower (3) and upper (2) parts (FIG. 2);

[0034] intermediate by taking hold of the device between the two oval and extension parts, i.e. at the level of the joining points of the different strips (A+C) (D+B) (FIG. 4);

[0035] strong by taking hold of the device at the level of the said thin strips (6 and 7) (FIG. 5);

[0036] very strong by taking hold of the device at the level of the lateral extensions of the "ear" type (4, 5) (FIG. 3);

[0037] "torsion" by taking hold of the device at the level of the lateral extensions of the "ear" type (4, 5) and by bringing the said extensions against one another (FIG. 6).

[0038] When the device is taken hold of at the level of the lower (3) and upper (2) parts, and pressure is applied towards the interior of the device (pressure represented by arrows in the figures), the thin strips (6 and 7) (on the side of their curvature towards the exterior) accompany the movement without providing any resistance.

[0039] On the other hand, when the device is taken hold of at the level of the lateral extension parts (4, 5) and the same type of pressure is applied towards the interior, the said thin strips (6 and 7) are stretched, thus creating increased resistance which opposes the pressure applied.

[0040] When the device is taken hold of at the level of the joining points (A and C) or (B and D), and pressure is applied

towards the interior, the deformation of the said thin strips creates an intermediate resistance force.

[0041] When the device is taken hold of at the level of the thin strips (6, 7) and pressure is applied towards the interior, a strong resistance force is created. In addition, starting from a certain pressure applied by the user, i.e. at approximately 80% of the maximum force applicable, the device begins to oscillate and tremble (as a result of the distributions of weight, in particular of the lateral extensions of the "ear" type), and thus gives rise to vibrations which are transmitted to the muscles of the forearms.

[0042] Different resistance forces are obtained by means of the variation of thickness of the different strips and the blockage of the deformation by means of the thin strips which connect A to B and C to D.

[0043] Tests were carried out on the said device according to the present invention, see FIGS. 9 to 12, by compressing it progressively (as during its recommended use), on a dynamometric platform which carries out sampling at 100 Hz. The results are as follows (expressed in kg):

[0044] Low resistance force: average load at maximal compression of 14 kg, with a maximal load of 16.2 kg applied;

[0045] Intermediate resistance force: average load at maximal compression of 13.1 kg, with a maximal load of 15.2 kg applied;

[0046] Strong resistance force: average load at maximal compression of 17.5 kg, with a maximal load of 18.5 kg applied;

[0047] Very strong resistance force: average load at maximal compression of 20.2 kg, with a maximal load of 22.6 kg applied.

[0048] These tests show that, for the device according to the present invention, the resistance force increases progressively until it reaches a maximal "plateau", as the said device is compressed.

[0049] For the purpose of comparison, a load measurement was also carried out (in kg) during a "bench-press" exercise (exercise carried out in a prone position, holding a bar which supports weights, with arms stretched up above the torso, and bringing the bar into contact with the torso then raising it once more) with a load which approximated that of the maximal load produced by means of the device according to the invention.

[0050] It can be noted that, for the "bench-press" (see FIG. 8), the resistance force was virtually maximal from the beginning of the movement, then decreased slightly as the load was thrust.

[0051] Consequently, whilst making the same muscles (the pectorals) work, a better result is obtained by using the device according to the present invention than by carrying out a bench-press exercise (for the same weight).

[0052] It will be appreciated that persons skilled in the art will know how to modify the resistance forces according to the applications required.

[0053] Thus, it is possible to carry out varied exercises which are suitable for everyone (from the occasional user to the experienced user), without using different devices and without making any adjustments.

[0054] It is altogether possible to provide devices which have dimensions other than those described in the present application, provided that they make it possible to retain all the technical characteristics of the said device. In fact, it may be advantageous to provide smaller devices (which for

example are designed for children), or on the other hand which are larger, according to the applications and exercises to be carried out. It is also possible to modify the reinforcement and grasping elements.

[0055] Examples of use of the device according to the present invention:

EXAMPLE 1

[0056] By taking hold of the device according to the present invention by the lateral extensions of the "ear" type (4 ad 5) in the hands, placing the elbows at the level of the parts (3 and 2), and pressing the elbows inwards, the work carried out acts efficiently on the large pectoral muscles.

EXAMPLE 2

[0057] By taking hold of the thin strips (6 and 7) in the hands and stretching one's arms almost to the maximum, whilst exerting pressure towards the interior of the device, the work carried out acts efficiently on the pectoral muscles. During sustained exercise, the vibration obtained by means of this position makes it possible to improve even further the work on the pectoral muscles.

EXAMPLE 3

[0058] Whilst seated on the ground, the knee is placed on the device according to the invention at the level of the joining points (A or C or D or B), and by being supported on the ground and opening one's leg outwards, the abductor muscles of the leg are worked.

[0059] These are only a few examples out of many possible uses of the device according to the present invention, which cannot all be listed since the applications of the said device are vast.

[0060] The invention also covers all the embodiments and applications which will be directly accessible to persons skilled in the art upon reading the present application, and on the basis of their own knowledge.

1. Device which permits body building in particular of the lower and upper limbs (the pectoral muscles, triceps, abdominal muscles, dorsal muscles and muscles of the legs and thighs, as well as of other groups of muscles, etc), characterised in that the said device (1) has a substantially oval shape and has two lateral extensions (4, 5) of the "ear" type, which inter alia allow it to be grasped by a user, and in that the said device also comprises two strips (6, 7) which are thinner than the main strip which forms the assembly of the device (2, 3, 4, 5), the said thin strips (6, 7) having curvature towards the exterior of the device; these two thin strips being formed on the prolongation of the oval created by the device, and therefore passing through the said extensions, and connecting the points A and B/C and D.

2. Device according to claim 1, characterised in that the said device is preferably a part made in a single piece of injected plastic (PA 6 (polyamide nylon 6).

3. Device according to claim 2, characterised in that it is possible to place a steel strip inside the plastic, also in order to provide greater resistance.

4. Device according to any one of claims 1 to 3, characterised in that the plastic materials used in the manufacture of the device have the following characteristics: good resistance to traction, flexure capacity, good resistance to impacts, high mechanical strength, rigidity, hardness, good resistance to fatigue and wear; or use can be made of any other material

accessible to persons skilled in the art, which makes it possible to produce a device of this type in a single piece, with high strength and a substantial memory effect, so that the part can regain its initial form irrespective of the deformation applied, and that the device can be used regularly over a long period of time, still providing optimal qualities of use throughout the duration of its use.

5. Device according to any one of claims 1 to 4, characterised in that all the curved parts which are formed on this device as a result of its oval form are slightly curved towards the exterior; the radius of the main strips and of the lateral extensions of the "ear" type is preferably 120 mm.

6. Device according to any one of claims 1 to 5, characterised in that, in order to provide the assembly with greater strength, it is possible to provide elements (9) of a reinforcement type, in the locations where the tensions applied are strongest, i.e. substantially at the level of the top points of curvature (e, f) and at the level of the joining points of the strips (A, B, C, D).

7. Device according to any one of claims 1 to 6, characterised in that, at the level of the tops of the four arcs formed by the main strip of the device (2, 3, 4, 5), i.e. at the level of the upper (2), lateral (4, 5) (extensions of the "ear" type) and lower (3) parts, it is possible to place an additional comfort moulding (8) made of elastomer (or polyethylene or polyurethane foam), to make the device easy to grip and use.

8. Device according to claim 6 or claim 7, characterised in that it comprises ten elements altogether of the additional comfort moulding type (8) and reinforcement type (9).

9. Device according to any one of claims 1 to 8, characterised in that the device has a dimension of approximately 50 cm in diameter, and in that the width of the strips of the device is approximately 7 mm for the thick portions (2, 3, 4, 5) and approximately 4 mm for the thinner portions (6, 7).

10. Device according to claim 9, characterised in that the dimensions are as follows: diameter 51 cm and width of strips 5 cm.

11. Device according to any one of claims 1 to 10, characterised in that the compression loads according to different resistance forces are as follows (expressed in kg):

Low resistance force: average load at maximal compression of 14 kg, with a maximal load of 16.2 kg applied;

Intermediate resistance force: average load at maximal compression of 13.1 kg, with a maximal load of 15.2 kg applied;

Strong resistance force: average load at maximal compression of 17.5 kg, with a maximal load of 18.5 kg applied;

Very strong resistance force: average load at maximal compression of 20.2 kg, with a maximal load of 22.6 kg applied.

12. Use of the device according to any one of claims 1 to 11, characterised in that it is possible to exert different resistance forces according to the locations at which the user takes hold of the said device, and thus according to the locations where the user applies the pressures:

low by taking hold of the device simply at the level of the lower (3) and upper (2) parts;

intermediate by taking hold of the device between the two oval and extension parts, i.e. at the level of the joining points of the different strips (A+C) (D+B);

strong by taking hold of the device at the level of the said thin strips (6 and 7);

very strong by taking hold of the device at the level of the lateral extensions of the "ear" type (4, 5);

“torsion” by taking hold of the device at the level of the lateral extensions of the “ear” type (4, 5) and by bringing the said extensions against one another.

13. Use of the device according to claim **12**, characterised in that when taking hold of the device (1) at the level of the lateral extension parts (4, 5), and when the same type of pressure is applied towards the interior of the device, the said thin strips (6 and 7) are stretched, thus creating increased resistance which opposes the pressure applied.

14. Use of the device according to claim **12**, characterised in that when the said device (1) is taken hold of at the level of the joining points (A and C) or (B and D), and when pressure

is applied towards the interior of the device, the deformation of the said thin strips creates an intermediate resistance force.

15. Use of the device according to claim **12**, characterised in that when the said device (1) is taken hold of at the level of the thin strips (6, 7), and when pressure is applied towards the interior, a strong resistance force is created, and starting from a certain pressure applied by the user, i.e. at approximately 80% of the maximal force applicable, the device begins to oscillate (as a result of the distributions of weight, in particular of the lateral extensions of the “ear” type) and thus gives rise to vibrations which are transmitted to the forearms.

* * * * *