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(54) ISOMETRIC EXERCISE DEVICE

ISOMETRISCHE TRAININGSVORRICHTUNG

APPAREIL D'ENTRAINEMENT ISOMETRIQUE

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Description

[0001] The present invention relates to an isometric exercise device and, in particular, to a hand-held isometric exercise device.

[0002] The benefits of physical exercise have long been recognised both with regard to an improved level of physical fitness and muscle strength and also through associated advantages such as improved skeletal strength.

[0003] In line with such realisations, the amount and variety of physical exercise undertaken by individuals has increased. For example, for strength training, this has lead to an increase in gym membership and an increase in individuals performing weighted workouts either with free weights or through the use of multi-gym equipment.

[0004] However, for those seeking to increase muscle strength, it has been recognised that such use of free weights and multi-gym equipment may not be the most appropriate means for achieving optimal muscle stimulus. Also the manner in which such apparatus is used may itself be preventing the majority of individuals from achieving the results desired from their strength training.

[0005] The nature of most individual's weight-related training comprises a twice/thrice weekly gym visit where a level of weight considered comfortable with will be chosen and a predetermined number of repetitions and sets of exercises will be performed. For example, it is common to perform three sets of ten repetitions with a weight which, to the individual, feels suitably heavy. On the next visit to the gym, a fairly similar workout regime will be undertaken.

[0006] However, it is generally recognised that, for muscle growth, there has to be a progressive overload of the muscles being exercised at each weight training session. It is recognised that a sufficiently powerful stimulus is required by the brain to produce an adaptive response in the musculature, and such stimulus generally results from making the muscles work harder than they are accustomed to at each and every training session.

[0007] The natural course of recovery, repair and growth required by the body of the average individual regularly attending a gym does not arise because the subsequent training session generally occurs too soon after the previous one and before the body has had a chance to complete its adaptive response. It is considered that muscles need in the region of 2-6 weeks, depending of course upon each individual, to fully recover, repair and grow. Thus, if a heavy weighted workout is performed and, within that minimum period, i.e. one week later, the body is stressed again before it is ready and has fully recovered from the previous session, the muscle groups worked are not capable of lifting weights which are greater than those used in the first session and so the above-mentioned progressive overload cannot be achieved. Such general over-training, albeit possibly accidental, is pursued by the vast majority of individuals following strength training regimes, and generally leads to plateaus and stagnation in strength increase and muscle growth, rather than the growth and increase in muscle mass that is sought from following such regimes.

[0008] It can therefore be appreciated that the average individual regularly attending a gym is likely to be missing out on potential increases in strength and muscle growth by not pursuing such progressive overload and its resulting adaptive response. By generally repeating the same exercise at each gym visit with more or less the same weight as previously used, the body will not receive sufficient stimulus to produce an adaptive response. What is generally required however is a constantly increasing progressive overload which optimally taxes the muscle each and every workout. The vast majority of individuals performing the above-mentioned sets and repetitions of exercises tend to be working well under their optimal levels of strength. Since the muscles employed can therefore generally easily perform the required repetitions, they are not then forced to adapt and so the adaptive response mentioned above is not experienced and no, or very limited, muscle growth is then experienced. Thus, the general increase in body strength and muscle size sought by those pursuing a strength-training regime is not readily achieved.

[0009] The present invention relates to an isometric exercise device wherein a force is applied by the tensing or extension of one or more muscles against a generally immovable object for a period of a few seconds in order that the individual can exert a maximum possible force against that object.

[0010] It should of course be appreciated that isometric exercises are distinguished from isokinetic exercises where muscle force is applied to a movable object so as to move the same through its permitted motion such as with an exercise machine, and also from isotonic exercises, such as that generally employed in weight training, where a constant weight is lifted through a particular range of motion.

[0011] Isometric training was first introduced in the 1960's and it is appreciated that such isometric exercise can create massive stimulus to a muscle.

[0012] However, while such massive stimulus can be readily applied to a muscle, it is nevertheless important to employ such isometric exercise within a proper exercise regime allowing for the above-mentioned progressive overload and adaptive response in the musculature.

[0013] Various forms of isometric exercise apparatus are known and which generally serve to mimic known multi-gym apparatus. However these are relatively expensive, bulky and unnecessarily complex and are not readily adapted for use within a domestic environment.

[0014] Isometric exercise devices are known from US Patent 4023808 and US Patent 4852874 and which both utilise elastic stretch band arrangements as resistance elements. However, such apparatus can prove to be unnecessarily bulky, prone to breakage and malfunction and the range of exercises that can be performed, and the manner in which the devices can be utilised so as to

achieve the above-mentioned adaptive response, is disadvantageously limited.

[0015] US 5735776 is one of a variety of prior art documents corresponding to the preamble at claim 1 disclosing use of an inflatable spherical device, in this document an exercise ball, for use in relation to an isometric exercise routine but which, in view of its spherical form is relatively unstable, intended to be rolled upon by the user on the tiling floor surface during an exercise routine and which simply includes strap handles for assisting with gripping and stability but which could find no use whatsoever within exercise routines achievable by way of the present invention.

[0016] The present invention therefore seeks to provide for an isometric exercise device having advantages over known such devices.

[0017] According to the present invention there is provided a hand-held isometric exercise device comprising the features of claim 1.

[0018] The device of the present invention, being hand-held and comprising a deformable portion which is to be urged against a, generally stationary surface, advantageously provides for a particularly compact and simple device which can be gripped by the user and used in relation to any appropriate surface, whether horizontal, vertical or otherwise, to allow for a wide variety of exercises to be performed.

[0019] Yet further, through the determination and indication of the level of force applied by the user to the device, when deforming the deformable portion against the said surface, it readily becomes possible to identify the correct exercise regime that a particular individual should pursue, so as to allow for the appropriate rest, recovery and repair period prior to using the device again.

[0020] The present invention therefore advantageously allows for the pursuit of an increase in strength and muscle growth, in a simple manner and within a wide variety of environments, such as, for example, a standard domestic environment. The apparatus is compact and readily stored and used and can easily be enhanced with appropriate surface decoration in order to improve the aesthetic qualities thereof.

[0021] Preferably, the handle portion is formed integral with the deformable portion and, further, the handle and deformable portions can be formed as a unitary member.

[0022] Further, the handle portion itself can, to some extent, be deformable. Also, and particularly if the handle exhibits some rigidity, the handle can be arranged to be urged by the user onto the deformable portion to at least partly assist in the deformation thereof.

[0023] Further, the handle can advantageously be generally elongate and arranged to be gripped in a clenched manner by the hand of the user.

[0024] The handle can then advantageously allow for the knuckle portion of a user's clenched fist to engage with a surface of the deformable portion so as to assist with the deformation thereof when urged against the said surface.

[0025] Preferably, the handle portion is spaced from the deformable portion so as to define an opening by means of which the user can fully grip the handle.

[0026] In another embodiment, the deformable portion can be deformed so as to allow for the user's hand to be placed between the handle and the said deformable portion.

[0027] Advantageously, the deformable portion is formed of a resilient material.

[0028] Further, the deformable portion advantageously comprises at least one cavity and the said at least one cavity is advantageously at least part-filled with a fluid such as a liquid and/or with air or an appropriate gas.

[0029] Preferably, the deformable portion can have a generally elongate form and be substantially cylindrical in shape.

[0030] The said means for determining the level of force applied to deform the deformable portion can advantageously comprise pressure sensing means arranged to determine an increase in pressure arising within the deformable portion during use of the device.

[0031] Advantageously, the said means for determining the level of force comprises means for determining an increase in pressure of a fluid within the deformable portion.

[0032] The means for indicating the level of force applied by the user advantageously comprises a visual display means and which can advantageously comprise an alphanumeric display.

[0033] Such display means can comprise an electronic display means, powered, for example, by way of a battery or by one or more solar power cells, and can, for example, comprise an LCD display. Advantageously, the display is arranged to store the maximum reading produced so that at the end of each isometric exercise session, the maximum level of force applied can be readily determined by the user.

[0034] The means for indicating the level of force applied is advantageously located on the outer surface of the deformable portion although it could, as required, be located on an outer surface of the handle portion.

[0035] Yet further, the means for indicating the level of force applied can advantageously comprise means for providing an audible output, and, in particular, means for providing an audible output when a threshold level of force is exceeded.

[0036] It will therefore be appreciated that a wide variety of forms of isometric exercise device can be provided within the concept of the present invention but which will share the primary advantages of a simple, hand-held device allowing for a ready determination of the maximum force applied during each isometric workout session, which indication can then be employed so as to ensure that the user can readily identify the appropriate rest/recovery/repair period before returning to use of the apparatus.

[0037] Thus, through use of the apparatus, the user can readily determine and control the appropriate fre-

quency of use of the apparatus and thereby pursue an optimum personal exercise regime with regard to muscle growth.

[0038] The invention is described further hereinafter, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a side view of an isometric exercise device embodying the present invention;
Fig. 2 is a plan view of the device of Fig. 1;
Fig. 3 is an end view of the device of Fig. 1;
Fig. 4 is a side view of the device of Fig. 1 when in use;
Fig. 5 is a side view of an isometric exercise device related to the subject matter of the present invention; and
Fig. 6 is a plan view of the device of Fig. 5.

[0039] Turning first to Fig. 1 there is illustrated one embodiment of an isometric exercise device 10 according to the present invention. Although only a single device is illustrated, it will be appreciated that they are generally arranged to be provided, and used, in pairs.

[0040] The hand held isometric exercise device 10 comprises a handle 12 and a deformable main body portion 14 which are formed together such that the device 10 is of a unitary nature.

[0041] Mounted on the side of the main body portion 14 is an LCD alphanumeric display 16 which is operatively connected to a pressure sensor device (not shown) operatively located within a cavity (not shown) in the main body portion 14.

[0042] The handle 12 and main body portion 14 are formed from the same resilient material. In some embodiments, the hollow cavity can also extend to within the handle 12.

[0043] In the illustrated embodiment, and as discussed further below, the cavity within the main body portion 14 is at least part filled with air and the aforementioned pressure sensor device is located and employed to determine the air pressure within the cavity.

[0044] Fig. 2 shows a plan view of the device 10 of Fig. 1, and Fig. 3 comprises an end view of the same device 10, from which it can be appreciated that the main deformable body portion 14 of the device is generally elongate and generally cylindrical in nature and that the handle 12 is likewise generally elongate and cylindrical in nature and shares the same longitudinal axis as the main body portion 14.

[0045] Turning now to Fig. 4, there is provided a side view of the isometric exercise device 10 similar to that in Fig. 1, but shown when in use as part of an isometric exercise regime and gripped by a hand 18 of a user and forced in the direction of arrow A against a stationary surface S.

[0046] As will be appreciated, the handle 12 of the device 10 is arranged such that it can be readily gripped within the clenched fist of a user such that the device is arranged to be gripped in a manner similar to common exercise equipment such as a dumb-bell. Once so gripped, the user then exerts a downward force on the device in the direction of arrow A and urges the device against the stationary surface S through application of the maximum possible force that the user can exert. Such force serves to deform the deformable main body portion 14 which in turn serves to produce an increase in pressure within the cavity of the main body portion 14. This increase is determined by the pressure sensor (not shown) and, in turn, drives an appropriate output from the alphanumeric display 16 which provides a readily visible indication of the maximum force exerted by the user through determination of the maximum pressure arising within the main body portion 14.

[0047] The exact manner in which the pressure increase within the main body portion 14 occurs depends upon the particular construction and configuration of the device.

[0048] For example, should the handle 14 be formed from the exact same material as the main body portion, and generally comprise an extension thereof and, possibly, with an extension of the cavity portion therein, then the primary force exerted by the user will be by way of their knuckles as they bear against the upper portion of the deformable main body portion 14 as illustrated in Fig. 4.

[0049] However, as an alternative or in addition, some degree of rigidity can be afforded the handle 12 such that movement of the handle 12 onto the lateral regions of the main body portion 14 likewise serves, at least in part, to deform the body portion and so lead to an increase in pressure within the cavity thereof.

[0050] It should also be appreciated that the manner of use indicated in Fig. 4 is provided merely for illustrative purposes since, in practice, it is unlikely that the device would be used in a manner such that the user exerts a downward force against a stationery surface.

[0051] More likely, the device would be used such that the user provides a upward force for example upwards against the underside of a doorframe, or the underside of a table/desk, so as to mimic the exertion of force when using dumb-bells or a barbell.

[0052] It will of course be appreciated that, a wide variety of forms of the handheld device of the present invention can be provided without departing from the inventive concept.

[0053] Although not illustrative of the embodiments of the present invention, Figs. 5 and 6 disclose subject matter related to the subject of the present invention.

[0054] Here, it will be seen that the isometric device 20 includes a strap handle 22 attached as appropriate to a generally ovoid hollow body portion 24 having a alphanumeric display member 26 mounted on the side thereof and which is arranged, through operative connection to a pressure sensor (not shown) within the body portion 24, to provide an indication responsive to an increase in pressure within the body portion.

[0055] Fig. 6 provides a plan view of the device of Fig.

5 so as to further illustrate the configuration of the strap handle 22 in the form of a strap member. The handle and body portion 24 of Figs. 5 and 6 do not readily combine to define an opening through which the handheld device can be readily gripped for use such as that of the embodiment of the invention as illustrated in Fig. 4.

[0056] However, through deformation of the upper part of the main hollow body portion 24, a user can attain an appropriate grip of the strap handle 22 in a manner similar to that illustrated with regard to Fig. 4 such that the isometric apparatus device 20 is then ready for use.

[0057] Although not visible in the accompanying drawings, the device of the present invention can be arranged to be used with the handle in tension. As such, the deformable portion 14, 24 is provided with an engagement formation allowing for the device to be anchored as required. In particular, a pair of such devices can be provided, one for use in each hand in compression mode such as illustrated in Fig. 4, and also when releasably secured by way of cooperating engagement formations so that the deformable portions 14, 24 can then be deformed by placing both of the handle portions 12, 22 in tension by pulling on the same.

[0058] Thus, it will be appreciated that by means of such engagement formations a yet further range and variety of isometric exercises can be provided by apparatus embodying the present invention.

[0059] Through use of the apparatus embodying the present invention during each isometric workout session, the user can readily determine the maximum force that was applied by the particular muscle and/or muscle group, being worked.

[0060] Such determination of the maximum force applied can advantageously be enhanced insofar as the pressure sensor/alphanumeric display device can be arranged to store, and continue to display, the maximum value reached.

[0061] Thus, even though the alphanumeric display 16/26 might not be visible during a particular form of exercise, it nevertheless records the maximum force exerted by the user such that when the isometric workout session is finished, the user can then readily read the maximum force applied.

[0062] As will be appreciated, the pressure indicator can, alternatively, or in addition, comprise audible output means which can advantageously be arranged to provide an audible output when a predetermined, or previously attained, level of force has been exceeded.

[0063] Also, the visual output means can be arranged to produce a visually discernable output when a predetermined, or previously attained, level of force has been exceeded.

[0064] The said predetermined level of force can be pre-selected as required.

[0065] In this manner, the user can advantageously use the device in a situation in which there is no need to view a display of the device since he/she need merely listen for the appropriate audible output.

[0066] When the user next returns to the apparatus for a repeated isometric workout session, and should the previous maximum force value obtained not be exceeded, this readily serves to indicate that the user has returned to the equipment too soon and the muscles and/or muscle group previously worked has/have not had sufficient time for recovery and repair.

[0067] However, should the previously recorded maximum force value be exceeded at the next isometric workout session, the user can readily appreciate that the muscles/muscle groups previously worked have been given sufficient time to recover and repair and, through noting the period of time that was allowed to lapse between the two exercise sessions, the user can then readily determine his/her optimum rest/recovery/repair cycle.

[0068] Subsequent isometric workout session can then be repeated in accordance with that cycle so as to achieve optimum increase in strength and optimum muscle growth.

[0069] The user can thereby readily monitor his/her ongoing exercise regime so as to continue to exercise, and achieve an increase in strength and muscle growth, in the most efficient manner.

[0070] It should of course be appreciated that the invention is not restricted to the details of the foregoing examples.

[0071] For example, the handheld device can be provided in any shape and/or configuration thought appropriate having regard to the manner in which the device is to be gripped and is to engage with a surface against which the isometric workout is to be conducted, and so as to achieve the appropriate range of possible pressure increases within the device.

Claims

1. A hand-held isometric exercise device (10) comprising a handle portion (12) and a deformable portion (14), the deformable portion(14) being arranged to be deformed responsive to a user-exerted force when the device is gripped by the handle portion(12) and urged against a surface, the device also including means (16) for determining and indicating a level of force applied by the user to deform the deformable portion (14),
   characterized by the handle portion (12) being elongate and arranged to be gripped in a clenched manner by the hand of the user and exhibiting sufficient rigidity that it can be urged by the user onto the deformable portion (14) to at least partly assist in the deformation thereof, wherein at least a portion of the outer surface of the deformable portion (14) includes a substantially flat portion located at a region of the deformable portion (14) substantially opposite that at which the said handle portion (12) is located and which is adapted to assist with a stable engagement with the surface against which the device is to be

urged.

2. A device as claimed in Claim 1, wherein the handle portion (12) is formed integral with the deformable portion (14).

3. A device as claimed in Claim 2, wherein the handle and deformable portions (12,14) are formed as a unitary member.

4. A device as claimed in any one or more of the preceding claims, wherein the handle portion (12) is spaced from the deformable portion (14) so as to define an opening by means of which the user can grip the handle portion (12).

5. A device as claimed in any one or more of the preceding claims, wherein the deformable portion (14) is formed of a resilient material.

6. A device as claimed in any one or more of the preceding claims, wherein the deformable portion (14) comprises at least one cavity.

7. A device as claimed in Claim 6, wherein the said at least one cavity is at least part-filled with a fluid.

8. A device as claimed in any one or more of the preceding claims, wherein the deformable portion has a generally elongate form and is substantially cylindrical in shape.

9. A device as claimed in any one or more of the preceding claims, wherein the said means for determining the level of force applied to deform the deformable portion comprises pressure-sensing means arranged to determine an increase in pressure arising within the deformable portion during use of the device.

10. A device as claimed in any one or more of the preceding claims, wherein the means for indicating the level of force applied by the user comprises a visual display means.

11. A device as claimed in Claim 10, wherein the visual display means comprises an alphanumeric display.

12. A device as claimed in Claim 10 or 11, wherein the display means is arranged to store the maximum reading produced.

13. A device as claimed in Claim 10, 11 or 12, wherein the visual display means is arranged to produce a visually discernable output when a threshold level of force is exceeded.

14. A device as claimed in any one or more of the preceding claims, wherein the means for indicating the level of force applied is located on the outer surface of the deformable portion.

15. A device as claimed in any one or more of the preceding claims, wherein the means for indicating the level of force applied can advantageously comprise means for providing an audible output.

16. A device as claimed in Claim 15, wherein the means for providing the audible output is arranged to provide the output when a threshold level of force is exceeded.

17. A device as claimed in any one or more of the preceding claims, wherein the deformable portion is provided with an engagement formation for releasably securing the device to a member allowing for the handle portion to be placed in tension by pulling the handle portion away from the said member and so as to deform the said deformable portion.

18. A device as claimed in Claim 17, wherein the said engagement formation comprises a male and/or a female engagement formation.

19. A device as claimed in Claim 17, wherein the said engagement formation comprises a press-fit formation.

20. A device as claimed in Claim 17, wherein the said engagement formation comprises a twist-fit formation.

21. A device as claimed in any one or more of Claims 17 to 20,
wherein the said member also comprises a device as claimed in any one or more of Claims 17 to 20.

22. A pair of isometric exercise devices each as claimed in any one or more of the Claims 17 to 20 and arranged to be releasably secured together by way of cooperating engagement formations.

Patentansprüche

1. Isometrisches Handübungsgerät (10), das einen Griffteil (12) und einen verformbaren Teil (14) aufweist, wobei der verformbare Teil (14) eingerichtet ist, um als Reaktion auf eine vom Benutzer ausgeübte Kraft verformt zu werden, wenn das Gerät durch den Griffteil (12) ergriffen und gegen eine Oberfläche gedrängt wird, wobei das Gerät weiter Mittel (16) zum Bestimmen und Anzeigen eines Niveaus der durch den Benutzer zum Verformen des verformbaren Teils (14) angewendeten Kraft einschließt, **dadurch gekennzeichnet, dass** der Griffteil (12) läng-

lich und so eingerichtet ist, dass er in einer umklammerten Weise durch die Hand des Benutzers ergriffen wird, und ausreichende Starrheit aufweist, dass er durch den Benutzter auf den verformbaren Teil (14) gedrängt werden kann, um wenigstens teilweise die Verformung desselben zu unterstützen, wobei wenigstens ein Teil der Außenfläche des verformbaren Teils (14) einen im Wesentlichen flachen Teil enthält, der sich in einem Bereich des verformbaren Teils (14) im Wesentlichen gegenüberliegend demjenigen befindet, an dem sich der Griffteil (12) befindet, und der angepasst ist, um einen stabilen Eingriff mit der Oberfläche zu unterstützen, gegen die das Gerät gedrängt werden soll.

2. Gerät nach Anspruch 1, bei dem der Griffteil (12) integriert mit dem verformbaren Teil (14) ausgebildet ist.

3. Gerät nach Anspruch 2, bei dem der Griff und die verformbaren Teile (12, 14) als ein Einheitselement ausgebildet sind.

4. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem der Griffteil (12) von dem verformbaren Teil (14) so beabstandet ist, dass eine Öffnung begrenzt wird, durch die der Benutzer den Griffteil (12) ergreifen kann.

5. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem der verformbare Teil (14) aus einem elastischen Material gebildet wird.

6. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem der verformbare Teil (14) mindestens einen Hohlraum aufweist.

7. Gerät nach Anspruch 6, bei dem der mindestens eine Hohlraum wenigstens teilweise mit einem Fluid gefüllt ist.

8. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem der verformbare Teil eine allgemein längliche Form hat und im Wesentlichen zylindrisch geformt ist.

9. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem das Mittel zum Bestimmen des Niveaus der zum Verformen des verformbaren Teils angewendeten Kraft ein Druckmessmittel aufweist, das zum Bestimmen eines Anstiegs des während Gebrauchs des Geräts in dem verformbaren Teil auftretenden Drucks eingerichtet ist.

10. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem das Mittel zum Anzeigen des Niveaus der durch den Benutzer angewendeten Kraft ein Sichtanzeigemittel aufweist.

11. Gerät nach Anspruch 10, bei dem das Sichtanzeigemittel eine alphanumerische Anzeige aufweist.

12. Gerät nach Anspruch 10 oder 11, bei dem das Anzeigemittel eingerichtet ist, um den erzeugten maximalen Messwert zu speichern.

13. Gerät nach Anspruch 10, 11 oder 12, bei dem das Sichtanzeigemittel eingerichtet ist, um eine visuell erkennbare Ausgabe zu erzeugen, wenn ein Grenzwert von Kraft überschritten wird.

14. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem sich das Mittel zum Anzeigen des Niveaus der angewendeten Kraft auf der Außenfläche des verformbaren Teils befindet.

15. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem das Mittel zum Anzeigen des Niveaus der angewendeten Kraft vorteilhaft Mittel zum Liefern einer akustischen Ausgabe aufweisen kann.

16. Gerät nach Anspruch 15, bei dem das Mittel zum Liefern einer akustischen Ausgabe eingerichtet ist, um die Ausgabe zu liefern, wenn ein Grenzwert von Kraft überschritten wird.

17. Gerät nach einem oder mehreren der vorhergehenden Ansprüche, bei dem der verformbare Teil mit einer Eingriffsstruktur zum lösbaren Befestigen des Geräts an einem Element versehen ist, wodurch ermöglicht wird, dass der Griffteil unter Spannung gesetzt wird, indem der Griffteil von dem Element weggezogen wird und somit der verformbare Teil verformt wird.

18. Gerät nach Anspruch 17, bei dem die Eingriffsstruktur eine Stecker- und/oder eine Buchsen-Eingriffsstruktur aufweist.

19. Gerät nach Anspruch 17, bei dem die Eingriffsstruktur eine Presspassungsstruktur aufweist.

20. Gerät nach Anspruch 17, bei dem die Eingriffsstruktur eine Verdrehpassungsstruktur aufweist.

21. Gerät nach einem oder mehreren der Ansprüche 17 bis 20, bei dem das Element weiter eine Einrichtung nach einem oder mehreren der Ansprüche 17 bis 20 aufweist.

22. Paar isometrischer Übungsgeräte, jeweils nach einem oder mehreren der Ansprüche 17 bis 20 und jeweils so eingerichtet, um mittels zusammenwirkender Eingriffsstrukturen lösbar miteinander verbunden zu werden.

Revendications

1. Dispositif d'exercice isométrique à main (10) comportant une partie poignée (12) et une partie déformable (14), la partie déformable (14) étant arrangée pour être déformée en réponse à une force exercée par un utilisateur quand le dispositif est saisi par la partie poignée (12) et sollicité contre une surface, le dispositif comprenant également un moyen (16) destiné à déterminer et à indiquer un niveau de force exercée par l'utilisateur pour déformer la partie déformable (14), **caractérisé par** la partie poignée (12) étant allongée et arrangée pour être saisie d'une manière serrée par la main de l'utilisateur et présentant une rigidité suffisante lui permettant d'être sollicitée par l'utilisateur sur la partie déformable (14) pour faciliter au moins partiellement sa déformation, dans lequel au moins une partie de la surface extérieure de la partie déformable (14) comprend une partie sensiblement plate située au niveau d'une région de la partie déformable (14) sensiblement opposée à celle à laquelle ladite partie poignée (12) est située et qui est adaptée pour faciliter une mise en prise stable avec la surface contre laquelle le dispositif doit être sollicité.

2. Dispositif selon la revendication 1, dans lequel la partie poignée (12) est formée d'une seule pièce avec la partie déformable (14).

3. Dispositif selon la revendication 2, dans lequel la partie poignée (12) et la partie déformable (14) sont formées sous la forme d'un élément monobloc.

4. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel la partie poignée (12) est espacée de la partie déformable (14) de façon à définir une ouverture par le biais de laquelle l'utilisateur peut saisir la partie poignée (12).

5. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel la partie déformable (14) est formée à partir d'un matériau élastique.

6. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel la partie déformable (14) comporte au moins une cavité.

7. Dispositif selon la revendication 6, dans lequel ladite au moins une cavité est au moins partiellement remplie d'un fluide.

8. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel la partie déformable a une forme généralement allongée et est de forme sensiblement cylindrique.

9. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel ledit moyen destiné à déterminer le niveau de force exercée pour déformer la partie déformable comporte un moyen détecteur de pression arrangé pour déterminer une augmentation de pression survenant à l'intérieur de la partie déformable lors de l'utilisation du dispositif.

10. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel le moyen destiné à indiquer le niveau de force exercée par l'utilisateur comporte un moyen d'affichage visuel.

11. Dispositif selon la revendication 10, dans lequel le moyen d'affichage visuel comporte un affichage alphanumérique.

12. Dispositif selon la revendication 10 ou la revendication 11, dans lequel le moyen d'affichage est arrangé pour stocker le relevé maximum produit.

13. Dispositif selon l'une quelconque des revendications 10, 11 ou 12, dans lequel le moyen d'affichage visuel est arrangé pour produire une sortie visuellement discernable quand un niveau seuil de force est dépassé.

14. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel le moyen destiné à indiquer le niveau de force exercée est situé sur la surface extérieure de la partie déformable.

15. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel le moyen destiné à indiquer le niveau de force exercée peut avantageusement comporter un moyen destiné à mettre en oeuvre une sortie sonore.

16. Dispositif selon la revendication 15, dans lequel le moyen destiné à mettre en oeuvre la sortie sonore est arrangé pour la mise en oeuvre de la sortie quand un niveau seuil de force est dépassé.

17. Dispositif selon l'une quelconque ou plusieurs des revendications précédentes, dans lequel la partie déformable est fournie d'une formation de mise en prise pour assujettir le dispositif de manière amovible à un élément permettant à la partie poignée d'être placée sous tension en tirant sur la partie poignée pour l'éloigner dudit élément et de façon à ainsi déformer ladite partie déformable.

18. Dispositif selon la revendication 17, dans lequel ladite formation de mise en prise comporte une formation de mise en prise mâle et/ou femelle.

19. Dispositif selon la revendication 17, dans lequel ladite formation de mise en prise comporte une formation à ajustement par pression.

20. Dispositif selon la revendication 17, dans lequel ladite formation de mise en prise comporte une formation à ajustement par torsion.

21. Dispositif selon l'une quelconque ou plusieurs des revendications 17 à 20, dans lequel ledit élément comporte également un dispositif selon l'une quelconque ou plusieurs des revendications 17 à 20.

22. Paire de dispositifs d'exercice isométrique chacun selon l'une quelconque ou plusieurs des revendications 17 à 20 et arrangés pour être assujettis ensemble de manière amovible par le biais de formations de mise en prise coopérantes.

Fig.1.

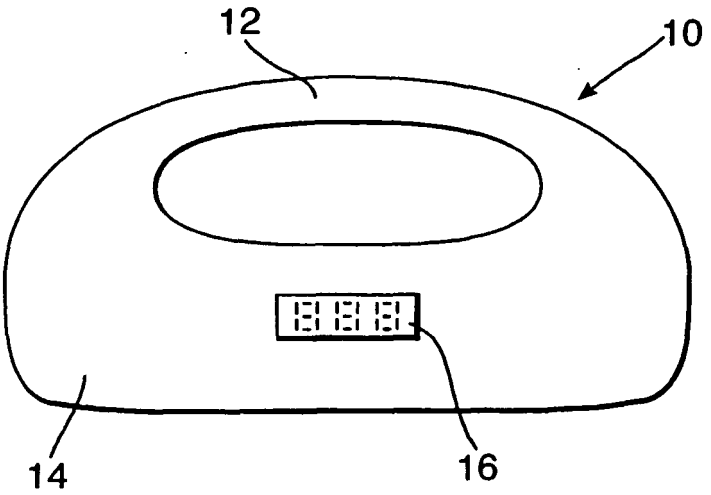


Fig.2.

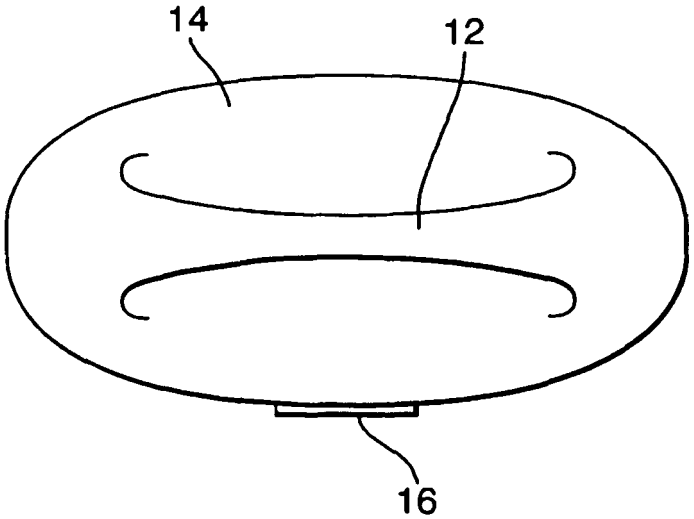


Fig.3.

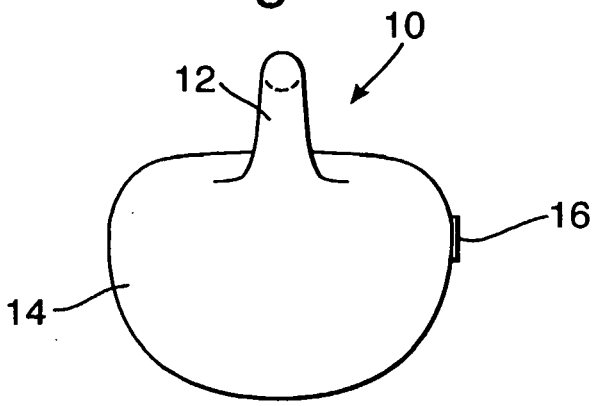


Fig.4.

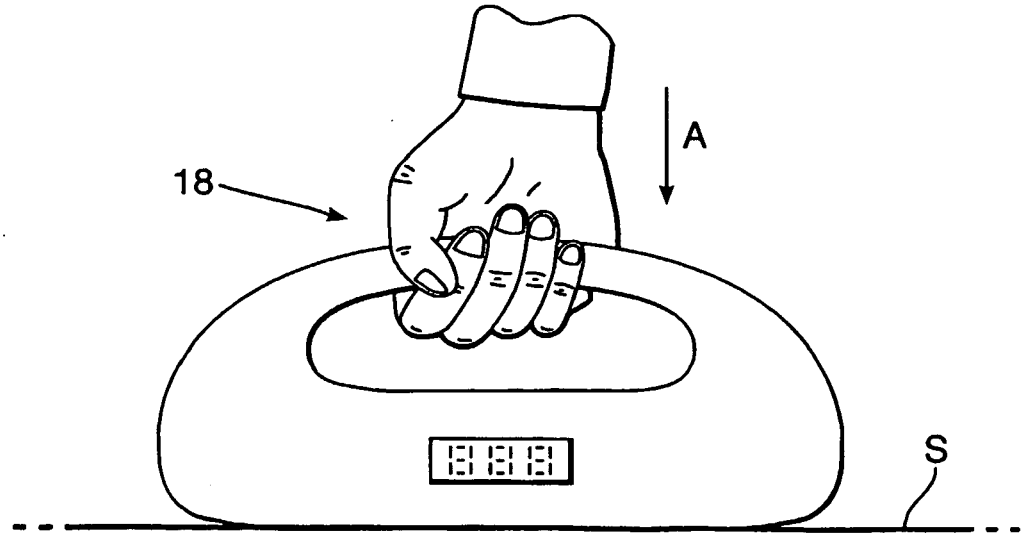


Fig.5.

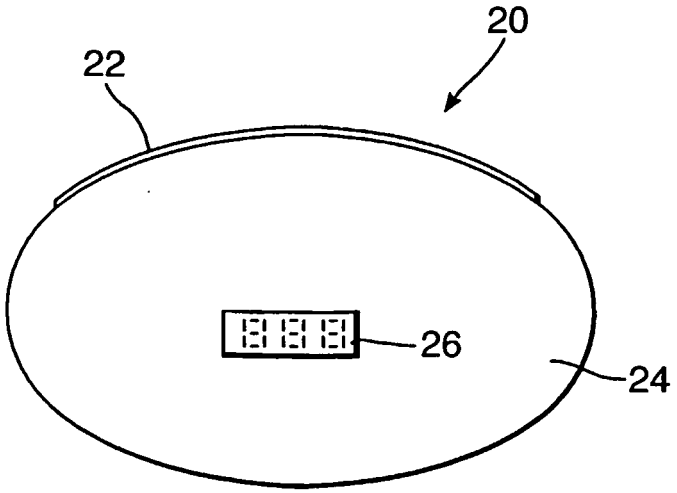
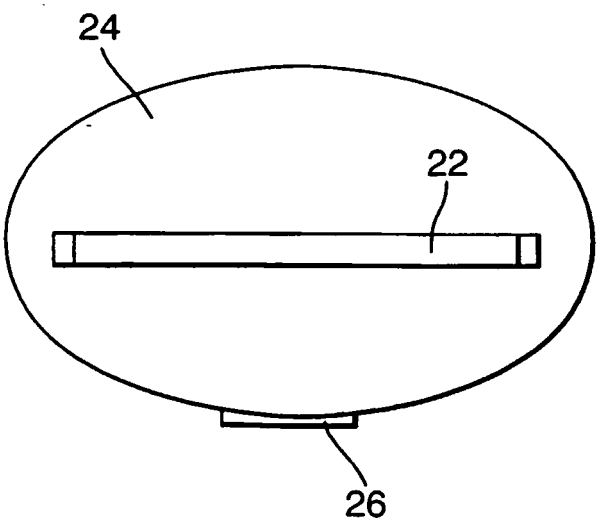


Fig.6.



REFERENCES CITED IN THE DESCRIPTION

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