

FITNESS AND THERAPEUTIC APPARATUS

FIELD OF THE INVENTION

- 5 Generally, the present invention relates to massage equipment, therapeutic equipment and physiotherapy equipment as well as equipment for myofascial pain therapy. Particularly, however not exclusively, the present invention pertains to a self-therapy apparatus for the toes and sole of foot.

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BACKGROUND

- Rehabilitation and muscle maintenance of athletes and persons in general encompasses a myriad of active and passive measures directed to accelerate
15 a person's physical recovery from daily life strain and physical exercise. Both average persons as well as athletes often benefit from hastened recovery, treatment of chronic ailments as well as proactive prevention of various ailments and injuries.

- 20 Various tools have been presented for massaging, exercising and stretching the soles and tips of feet. Generally known prior art solutions comprise e.g. massage balls and stress balls, such as tennis balls, foam balls and the like, used for stress relief and general massaging. Some other known prior art solutions comprise cryotherapy or heatable apparatuses such as ice
25 bags and ice buckets. Cylindrical massage and foam rollers are also known and commonly used for myofascial pain therapy for various parts of the body.

- The various prior art solutions differ vastly in their usability and therapeutic efficiency. Many of the solutions are manually usable balls, such as
30 foam balls or elastic balls with straps that are pressed against a surface or by the user's hand. Some of the balls comprise straps or protrusions on the surface for more use positions and more efficient soft tissue engagement. While widely used, portable, light and simple in structure, this category of
35 exercise and massage apparatuses has widely the shortcoming of having limited amount of rehabilitation and therapeutic exercise types and positions they provide.

Some examples of previous solutions are presented in the following publications.

5 JP2016019702 A (KASAHARA IWAO) presents a training equipment for improving straddling force of legs, which is essentially a toe-sandal shaped with through-holes for toes.

10 US5702331 A (PERHAM CHRISTINE M [US]) presents a non-gripping hand/foot resistance producing aquatic exercise apparatus and method of use, which comprises a columnar buoyant apparatus for water exercise.

15 JP2009118951 A (TANAKA MIYUKI) presents a ball-like training play device comprising a cubic octagonal cover with solid filling inside said cover, wherein the amount filler may be chosen in view of the preferred weight of the play device.

20 WO9710795 A1 (DESPAIN JULIANNE M [US]) presents a toe joint mobilization apparatus, which comprises an arrangement of surfaces on which a foot and a rigid ball for providing rolling motion for said foot are placed for exercise of the foot.

25 CN206761908u (SHENZHEN HENGDA LIYE TECH CO LTD) presents a hand-held type massage equipment with a plurality of protrusions at the surface of the equipment.

JP3139177U (KOSHIN YG) presents a health ball with a spherical or hemispherical shaped elastic body for massaging a surface of the body.

30 SUMMARY OF THE INVENTION

35 The objective of the embodiments of the present invention is to at least alleviate one or more of the aforementioned drawbacks evident in the prior art solutions particularly in the context of therapeutic, fitness, exercise and massage apparatuses for the sole of the foot and toes. The objective is generally achieved with an apparatus and use of apparatus in accordance with the present disclosure.

An advantage of the present invention is that it allows various different exercise and therapeutic treatment positions for the sole of the foot, the toes and other lower parts of the legs.

- 5 Another advantage of the present invention is that it allows for creating a suction-like effect via the elasticity, shape and at least one recess of the apparatus body when pressing the apparatus body and recess thereof with a person's body part against a surface.
- 10 In accordance with one aspect of the present invention a fitness and therapeutic apparatus comprising an elastic body, characterized in that said body further comprising at least partly ball-like shape and at least one recess, wherein the recess enables insertion of at least one toe or part of foot.
- 15 In accordance with one aspect of the present invention the use of a fitness and therapeutic apparatus comprising an elastic body, characterized in that said body further comprising at least partly ball-like shape and at least one recess, wherein the recess enables insertion of at least one toe or part of foot by pressing and releasing pressing of the apparatus body with at least
20 one toe or part of foot over the recess, while simultaneously supporting the apparatus body against a surface to create a suction-like effect to the recess and consequently to the at least one toe or part of foot inserted into the recess.
- 25 The apparatus may be used manually without supports or extensions, such as by pressing the apparatus with a part of the sole of the foot or with toes against a surface to facilitate massage or stretching of the soft tissue or mobilization of joints and bones in the feet or legs, such as soft tissue in the toes, ball of the foot, arches of the foot, heel, Achilles tendon, calf,
30 muscle membranes, and some bones and joints of the feet and legs, such as the calcaneus, ankle joint and bunion. Rolling motion as well as static pressure may be facilitated via the shape of the apparatus. Hence, rehabilitation, reinforcement, massage, myofascial therapy, stretching, increasing of functioning and mobilization of the soft tissue, bones, or joints of the
35 legs are some of the functionalities that may be achieved with the use of the apparatus in accordance with the present invention.

The apparatus in accordance with the many embodiments may be used for different kinds of rehabilitation of lower limb problems such as overpronation, Morton's foot, plantar fasciitis, bruising bone, hammer-knee and preventing various ailments and injuries.

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As briefly reviewed hereinbefore, the utility of the different aspects of the present invention arises from a plurality of issues depending on each particular embodiment.

- 10 The expression "a number of" may herein refer to any positive integer starting from one (1). The expression "a plurality of" may refer to any positive integer starting from two (2), respectively.

- 15 The term "exemplary" refers herein to an example or example-like feature, not necessarily to any sole preferable feature.

Different embodiments of the present invention are also disclosed in the attached dependent claims.

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BRIEF DESCRIPTION OF THE DRAWINGS

Some exemplary embodiments of the present invention are reviewed more closely with reference to the attached drawings, wherein

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- Fig. 1 depicts a view of an embodiment of the apparatus in accordance with the present invention,
Fig. 2 depicts a view of an embodiment of the apparatus in accordance with the present invention,
30 Fig. 3 depicts a view of an embodiment of the apparatus in accordance with the present invention,
Fig. 4 depicts a view of an embodiment of the apparatus in accordance with the present invention,
Fig. 5 depicts a view of an embodiment of the apparatus in accordance
35 with the present invention,
Fig. 6 depicts a view of an embodiment of the apparatus in accordance with the present invention,

Fig. 7 depicts a view of an embodiment of the apparatus in accordance with the present invention,

Fig. 8 depicts a view of an embodiment of the apparatus in accordance with the present invention.

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DETAILED DESCRIPTION OF THE EMBODIMENTS

10 Figs. 1-2 depict different views of an embodiment of the apparatus in accordance with the present invention. In this embodiment, the apparatus comprises a body (100) having at least in part a ball-like shape that has a number of indentations (104a, 104b, 104c, 104d, 106a, 106b), support areas (102a, 108a) and/or recesses (102b, 108b).

15 An essential property of the apparatus body (100) is to be elastic in the sense that the apparatus body (100) deforms when put under pressure but essentially returns to its shape when pressure is taken off. Some feasible materials for the body (100) of the apparatus comprise foam material, polyol-isocyanate mixture, and rubber. Some feasible materials are described
20 also in European Patent publication no. (EP)3059270(A1). An overlay of a material may also be used over the apparatus body (100) e.g. to achieve or improve non-slipping, moisture wicking, anti-bacterial and/or dirt repelling properties to the surface of the body (100).

25 The apparatus may be used by hand or it may be used by pressing the apparatus with a part of the user's body, such as with toes or a part of the sole of the foot, against a surface. The ball-like shape of the apparatus body (100) enables rolling movement and static hold (static movement) between a part of the user's body and another object, such a hand or surface
30 for example. The apparatus body (100) shape need not be a ball or ball-like and other shapes such as round shapes, such as oval and half-ball shapes are also feasible. However, the apparatus body (100) need not have a round shape.

35 The apparatus body (100) may comprise varying elasticity, softness and stiffness properties throughout the body (100). The apparatus body (100) is preferably solid excluding the indentations (104a, 104b, 104c, 104d, 106a, 106b) and recesses (102b, 108b) therein. The whole apparatus may

comprise material that has been manufactured to comprise homogenous stiffness or elasticity throughout the apparatus body (100). The whole apparatus may comprise material, which inherently comprises homogenous stiffness or elasticity throughout the apparatus body (100). Further, the number of indentations (104a, 104b, 104c, 104d, 106a, 106b), support areas (102a, 108a) and recesses (102b, 108b) of the body (100) essentially produce variance in stiffness in different directions of the apparatus body (100). In some embodiments, variance in elastic properties may be also achieved via different thickness of material throughout the apparatus body (100). In some embodiments, variance in elastic properties may be also achieved via different types of material at parts of the apparatus body (100).

Clearly, the dimensions of the apparatus may be scalable to a plurality of different dimensions. Some feasible dimensions comprise a diameter of some 50-150mm with different dimensions at the indentations (104a, 104b, 104c, 104d, 106a, 106b) and recesses (102b, 108b).

As shown in the figures, the apparatus may also comprise ornaments, such as the shown foot on the side of the apparatus. The ornaments may also serve as markings to show functions or guides of how to use the device.

Figs. 3-4 depict different views of an embodiment of the apparatus in accordance with the present invention. In these views, focus is directed to the two recesses (102b, 108b) in accordance with the embodiment.

The apparatus comprises at least one recess (102b, 108b) that is preferably at least deep and wide enough to fit one toe or part of the foot therein. The one or more recesses (102b, 108b) may be different in shape and dimensions e.g. in view of their intended use. In this embodiment, two different recesses (102b, 108b) have adjacent support areas (102a, 108a) around both of the recesses (102b, 108b). The support areas (102a, 108a) are used for additional support when a part of the foot is placed at or into the recess (102b, 108b). The shape of the support areas (102a, 108a) may be flat-like, or have one or varying arcuate one or more profiles over the width of the support areas (102a, 108a) and the geometry, such as their width, roundness and angle in relation to the apparatus body (100), may vary in view of the intended use of the recess (102b, 108b), wherein the intended

use may be predetermined e.g. in view of the person's body part intended to be inserted wholly or partly on, in or against the one more recesses (102b, 108b). In embodiments where there are two or more recesses (102b, 108b) the shape of the support areas (102a, 108a) may be different
5 from each other e.g. in accordance with the recess (102b, 108b) that they are surrounding or otherwise adjacent to.

In this embodiment, the other recess (102b) has an oval-like or egg-like shape wherein the other recess (108b) has essentially circular shape. The
10 recess (102b, 108b) shapes may also differ in terms of their 3D profiles, such that a recess (102b, 108b) may have a cylindrical or conical shape inside the apparatus body (100). In this embodiment, the oval-shaped recess (102b) is primarily meant for the toes whereas the circular-shaped recess (108b) is primarily meant for the heel. The oval-shaped recess (102b) in
15 accordance with this embodiment preferably has a profile with a gently sloping profile inside the apparatus body (100) when compared to the other recess (108b), which has essentially circular shape and steeper sloping profile inside the apparatus body (100). This way the oval-shaped recess (102b) with a gently sloping profile facilitates better to the insertion of the
20 toes while the other recess (108b), which has essentially circular shape and steeper sloping profile facilitates better to the heel. The recesses (102b, 108b) may be essentially opposing each other as in this embodiment or only one of the recesses (102b, 108b) may exist on the surface of the apparatus body (100) extending inside the apparatus body (100). The
25 depth of the recesses (102b, 108b) may be made different and the recesses (102b, 108b) may be joined by a through-hole, which may be arranged to affect the elastic properties, i.e. the stiffness or softness of the apparatus body (100). For example, the other recess (102b) may have a depth of 19-27mm whereas the other recess (108b) may have a depth 18-24mm.

30 The other recess (102b) with an oval-like shape may be used to increase mobilization of the first toe, treat the bunion and treat the hammer toe of the second toe. The other recess (108b) with a circular shape may be used to increase mobilization of the calcaneus and the lower ankle joint.

35 With the depicted embodiment the apparatus has the elastic properties such that the apparatus body (100) is softer in a perpendicular direction to the recesses (102b, 108b) and stiffer in the (depth-wise) direction of the

recesses (102b, 108b). The apparatus may be used to facilitate stretching of the ball of foot and muscle membranes e.g. in a direction of the recesses (102b, 108b). The apparatus may be used to facilitate rehabilitation and strengthening of foot in a direction perpendicular to the recesses (102b, 108b). The apparatus may be used against a surface by pressing a person's body part against and over a recess (102b, 108b) covering said recess (102b, 108b) and hence letting out air from the recess (102b, 108b) when pressing and creating a suction-like action inside the recess (102b, 108b) and against said body part when letting off the pressure against the apparatus body (100) due to the expansion of the volume of the recess (102b, 108b) and lack of air thereof in view of the expansion of the volume. This may be used to stimulate the connective tissue layer of a person's body part. The apparatus may also be used with another similar apparatus, such that they are used on top of each other for example to arrive at a preferred stiffness via the combined elastic properties of the two apparatuses. Two apparatuses on top of each other may be used to rehabilitate the Achilles heel and calves.

Figs. 5-6 depict different views of an embodiment of the apparatus in accordance with the present invention. In these views, focus is directed to the indentations (104a, 104b, 104c, 104d, 106a, 106b) in the apparatus body (100) in accordance with the embodiment.

A number of indentations (104a, 104b, 104c, 104d, 106a, 106b) may be used to facilitate grip for a number of toes in view of the anticipated use and preferred amount of functionalities of the apparatus. The indentations (104a, 104b, 104c, 104d, 106a, 106b) are preferably at a number of places on the side of the apparatus e.g. sufficiently away and/or separate from the recesses (102b, 108b) by being for example perpendicular to the one or more recesses (102b, 108b). In the depicted embodiment, the apparatus comprises two indentations (106a, 106b) on the other side and four indentations (104a, 104b, 104c, 104d) on another side. The indentations (104a, 104b, 104c, 104d, 106a, 106b) may be different in shape, depth and position on the apparatus body (100). The indentations (104a, 104b, 104c, 104d, 106a, 106b) may also have surface shapes, protrusions or structures to facilitate grip, stiffness and friction.

The indentations (104a, 104b, 104c, 104d, 106a, 106b) may have essentially oval-like shapes as depicted or circular shapes or any such shapes to facilitate grip for one or more toes. As an example, the indentations (104a, 104b, 104c, 104d, 106a, 106b) may have width in the range of 8-13mm and length in the range of 21-27mm between although clearly other shapes and sizes may be used as well.

The four indentations (104a, 104b, 104c, 104d) on a part of the side of the apparatus may be used e.g. to facilitate stretches of the smaller toes 2-5. The two other indentations (106a, 106b) may be used to facilitate stretching of the hammer toe.

Figs. 7-8 depict different views of an embodiment of the apparatus in accordance with the present invention. In these views, focus is directed to the indentations (104a, 104b, 104c, 104d, 106a, 106b), recesses (102b, 108b) and the support areas (102a, 108a) adjacent to or surrounding the recesses (102b, 108b) in accordance with the embodiment..

The apparatus body (100) may also comprise at least some part or number of areas with surface texture, surface pattern(s) or surface roughness higher than the adjacent surface roughness, which increase friction to a surface, such as the skin or floor, etc. The surface may comprise extrusions or extruding texture or patterning, which may be achieved via the manufacturing technique used to make the apparatus or via specific overlay or treatment of the surface or mechanically manipulating the surface. In manufacturing the apparatus body (100) may be made to comprise open cell foam structure internally whereas the surface may be made into tougher and less permeable leather-like structure.

As shown in the figures the apparatus may also comprise ornaments, such as the shown foot on the side of the apparatus. The ornaments may also serve as markings to show functions or as signs of how to use the device. For example, in this case a foot-like figure on the surface of the apparatus body (100) is arranged such that the toes of the foot figure point to the recess (102b), which recess (102b) is primarily meant for the toes, whereas the heel of the foot figure is directed to the recess (108b), which recess (108b) is primarily meant for the heel of the foot. This way the user may

easily and intuitively know instantly, which recess (102b, 108b) to use for, which parts of the their foot.

- 5 The scope of the invention is determined by the attached claims together with the equivalents thereof. The skilled persons will again appreciate the fact that the disclosed embodiments were constructed for illustrative purposes only, and the innovative fulcrum reviewed herein will cover further embodiments, embodiment combinations, variations and equivalents that better suit each particular use case of the invention.

CLAIMS

1. A fitness and therapeutic apparatus comprising an elastic body (100), **characterized in that** said body (100) further comprising at least partly ball-like shape and at least one recess (102b, 108b), wherein the recess (102b, 108b) enables insertion of at least one toe or part of foot.
2. The apparatus of any preceding claim, wherein the apparatus comprises at least one indentation (104a, 104b, 104c, 104d, 106a, 106b) for at least one toe.
3. The apparatus of any preceding claim, wherein the apparatus comprises a plurality of indentations (104a, 104b, 104c, 104d, 106a, 106b) for at least one toe at least at two separate places of the apparatus body (100).
4. The apparatus of any preceding claim, wherein the one or more indentations (104a, 104b, 104c, 104d, 106a, 106b) are essentially perpendicular to the one or more recesses (102b, 108b).
5. The apparatus of any preceding claim, wherein the apparatus body (100) comprises two recesses (102b, 108b).
6. The apparatus of claim 5, wherein the other recess (102b) comprises an oval shape and the other recess (108b) comprises a circular shape.
7. The apparatus of claim 5, wherein the two recesses (102b, 108b) are essentially opposing to each other.
8. The apparatus of any preceding claim, wherein the apparatus body (100) comprises a support area (102a, 108a) around or adjacent to the at least one recess (102b, 108b).
9. The apparatus of any preceding claim, wherein the at least one recess (102b, 108b) is at least partly cylindrical or conical.
10. The apparatus of any preceding claim, wherein the at least one recess (102b, 108b) comprises a through hole in the apparatus body (100).

11. The apparatus of any preceding claim, wherein apparatus comprises foam material.
12. The apparatus of any preceding claim, wherein apparatus body
5 (100) comprises an overlay.
13. The apparatus of any preceding claim, wherein at least part of the apparatus body (100) surface comprises surface texture, surface pattern(s) or surface roughness higher than the adjacent surface roughness.
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14. The apparatus of any preceding claim, wherein apparatus body (100) comprises different elastic properties in different directions.
15. Use of a fitness and therapeutic apparatus comprising an elastic
15 body, characterized in that said body further comprising at least partly ball-like shape and at least one recess, wherein the recess enables insertion of at least one toe or part of foot by pressing and releasing pressing of the apparatus body with at least one toe or part of foot over the recess, while simultaneously supporting the apparatus body against a surface to create a
20 suction-like effect to the recess and consequently to the at least one toe or part of foot inserted into the recess.