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(54) **TOE EXERCISE APPARATUS**

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(76) Inventor: **Eiji Nakanishi, Atsugi (JP)**

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Correspondence Address:
**ARMSTRONG, KRATZ, QUINTOS, HANSON
& BROOKS, LLP**
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006 (US)

(57) **ABSTRACT**

The apparatus includes: a heel resting board mounted at a rear portion of an outer frame section, the outer frame section being an outer frame of the entire apparatus; a pair of right and left sliding exercise boards mounted in front of the heel resting board and being movable forward and backward relative to the outer frame section; springs for constantly biasing the pair of right and left sliding exercise boards forward; convex sections disposed on each sliding exercise board at positions corresponding to base portions of a user's toes when the user rests his/her heels on the heel resting board.

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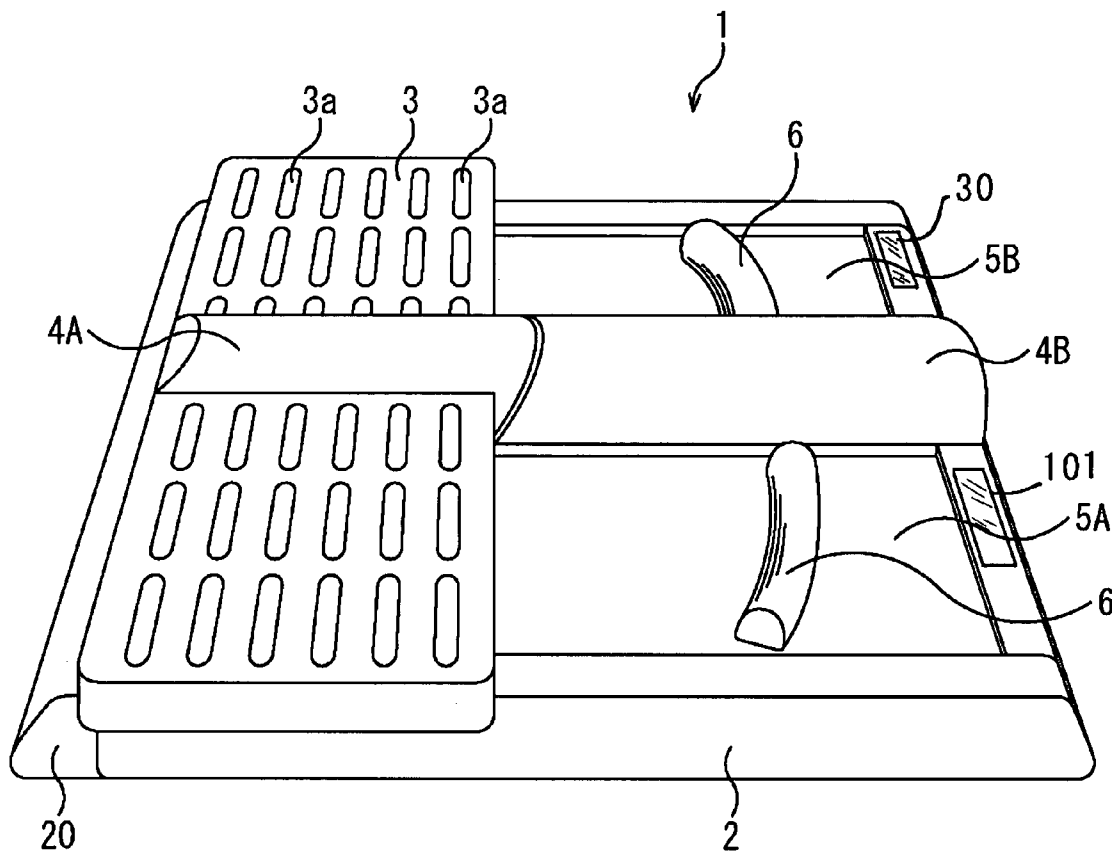


FIG. 1

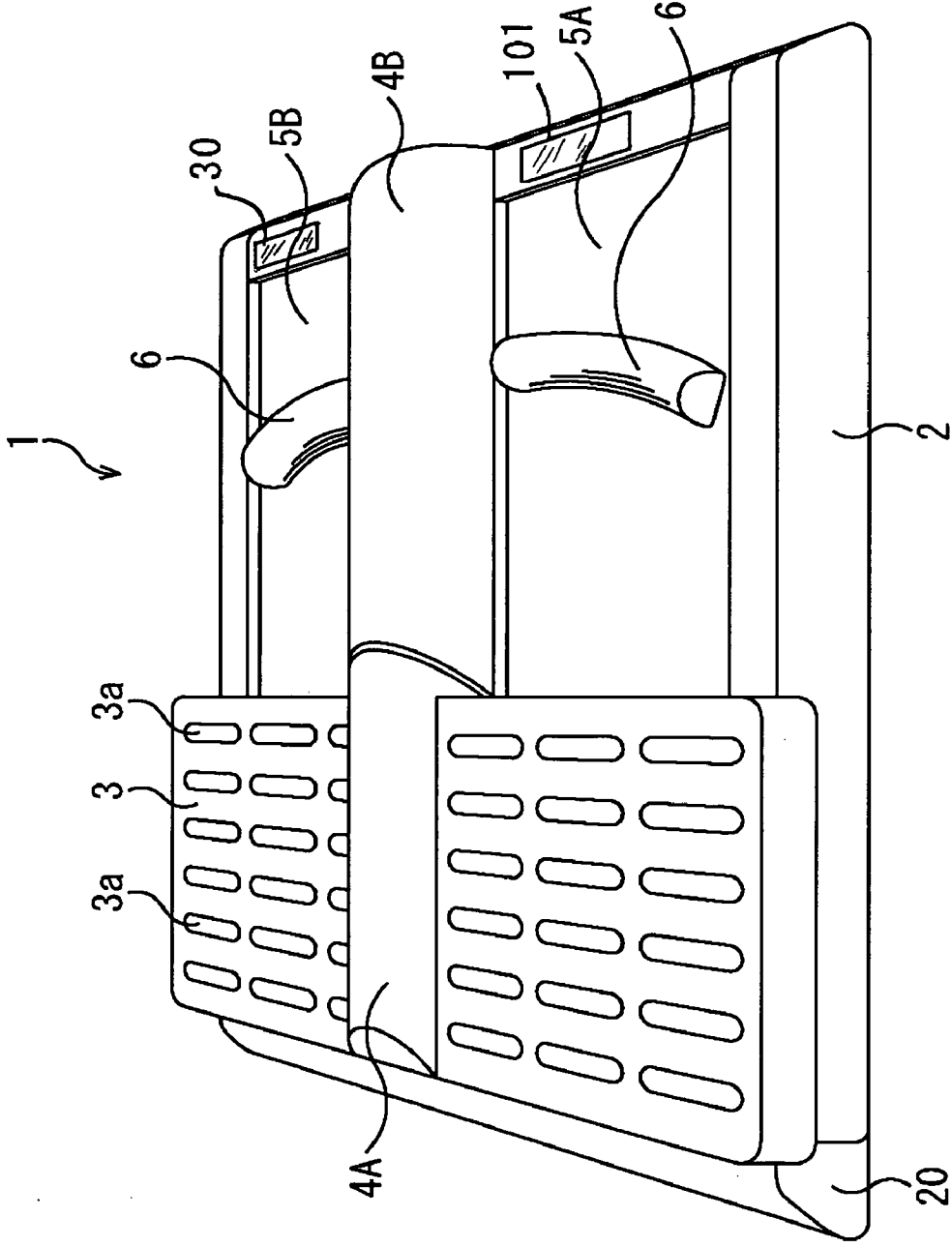


FIG.2

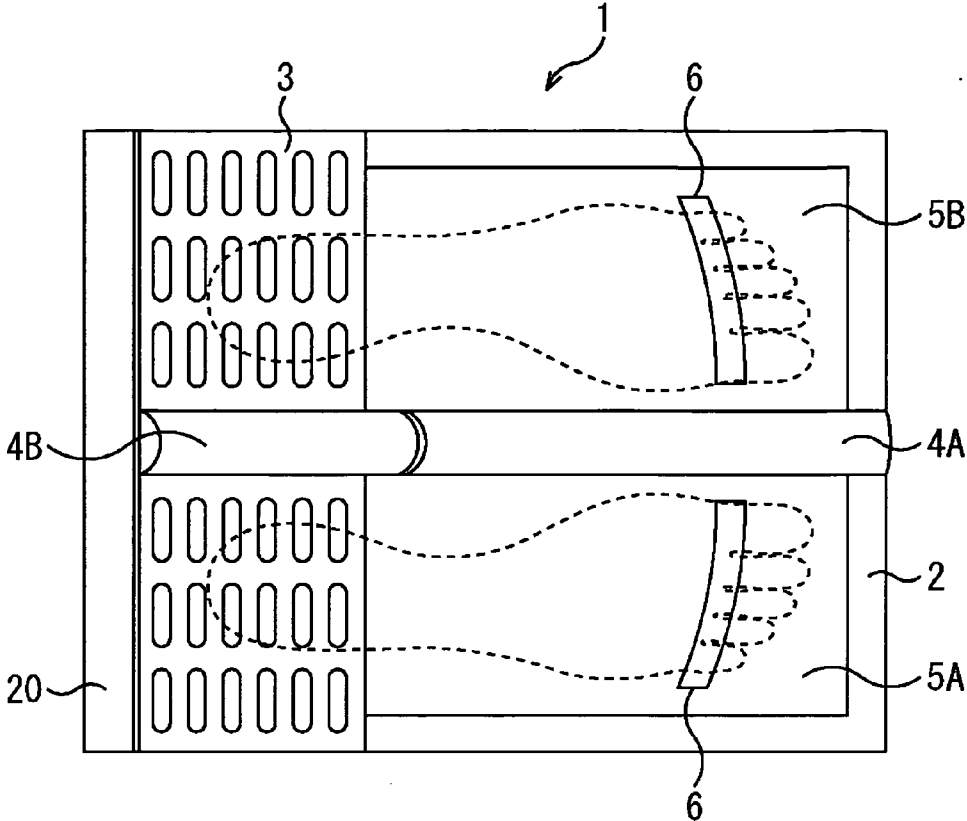


FIG.3

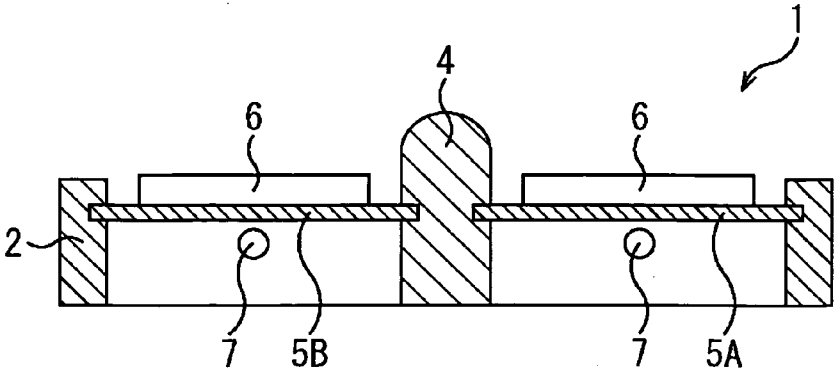


FIG.4

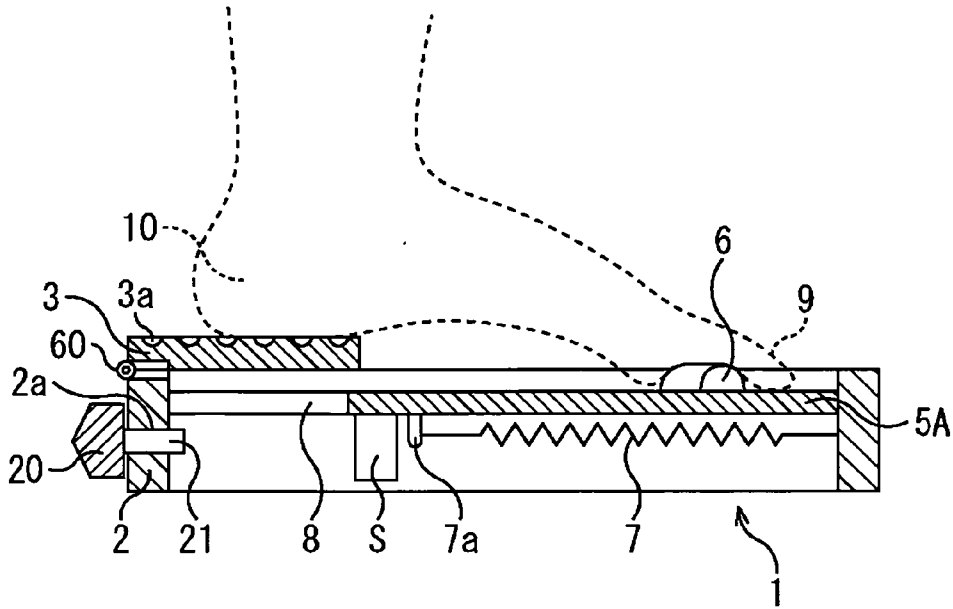


FIG.5

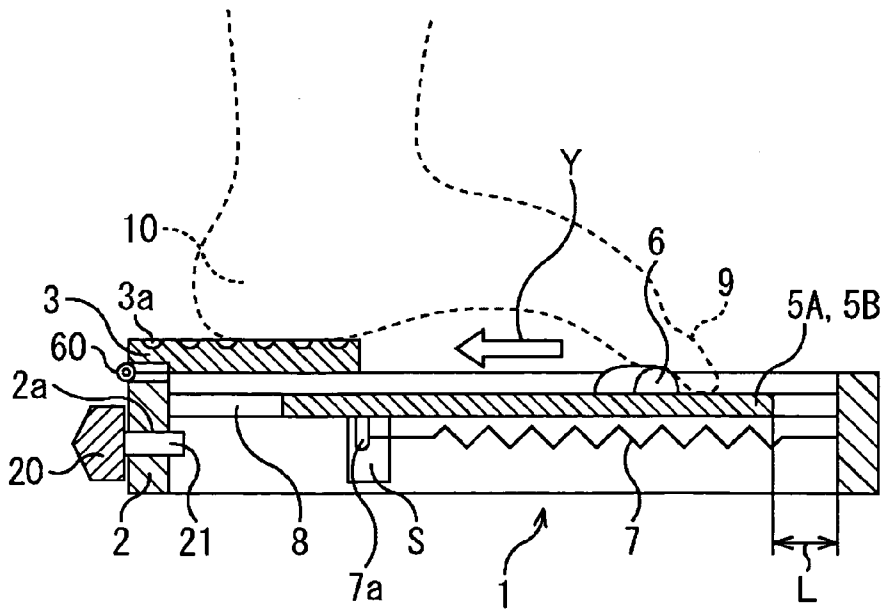


FIG.6

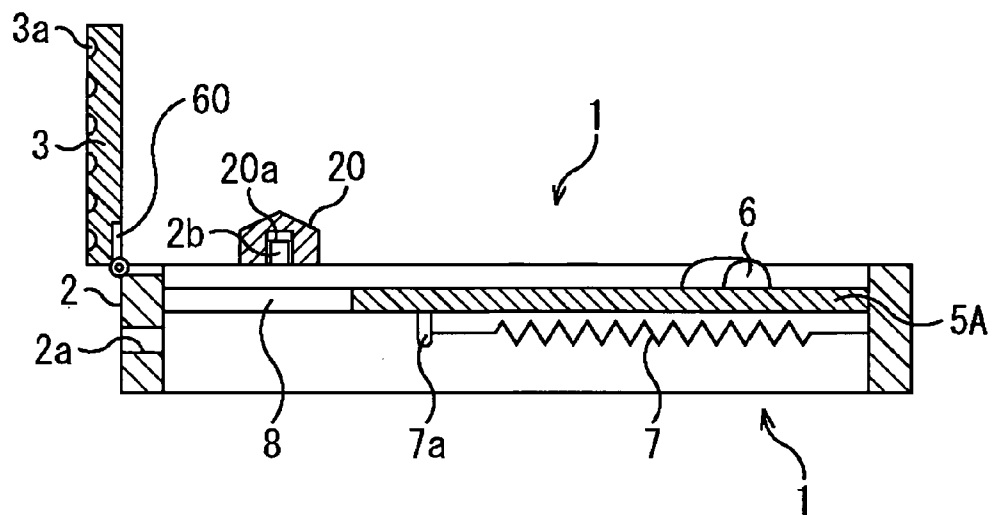


FIG.7

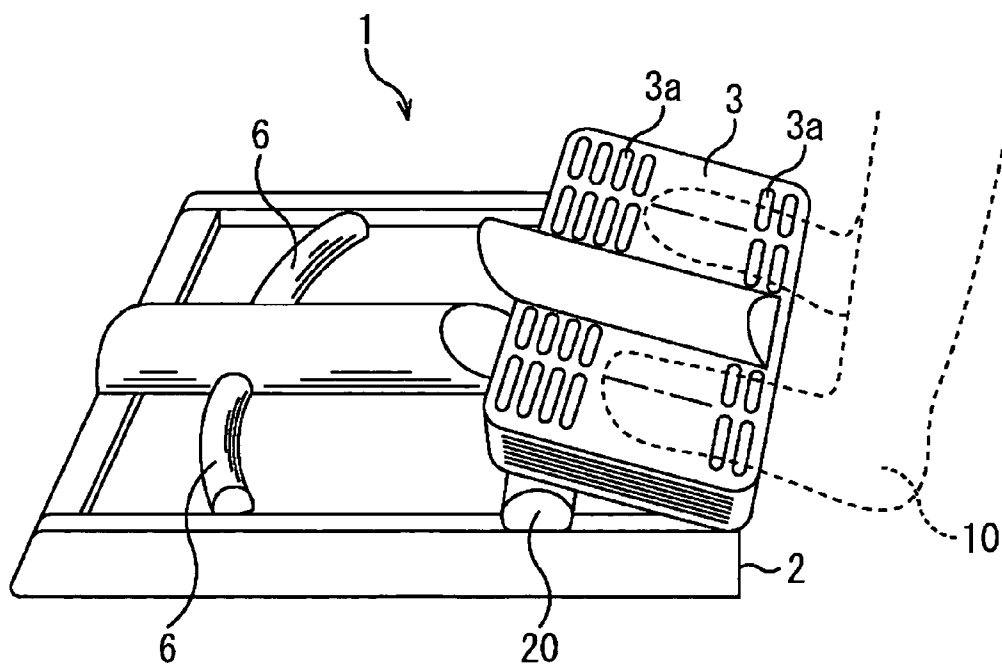


FIG.8

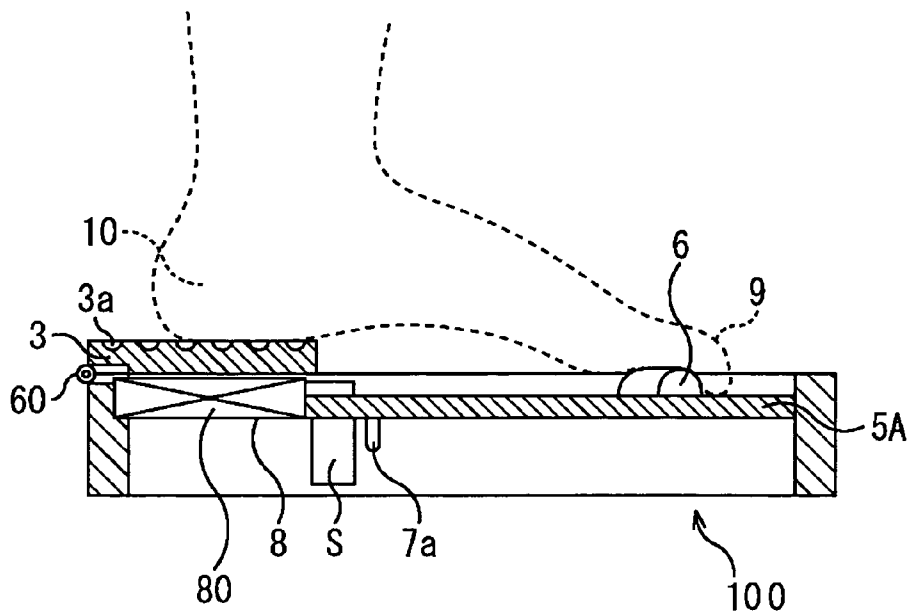


FIG.9

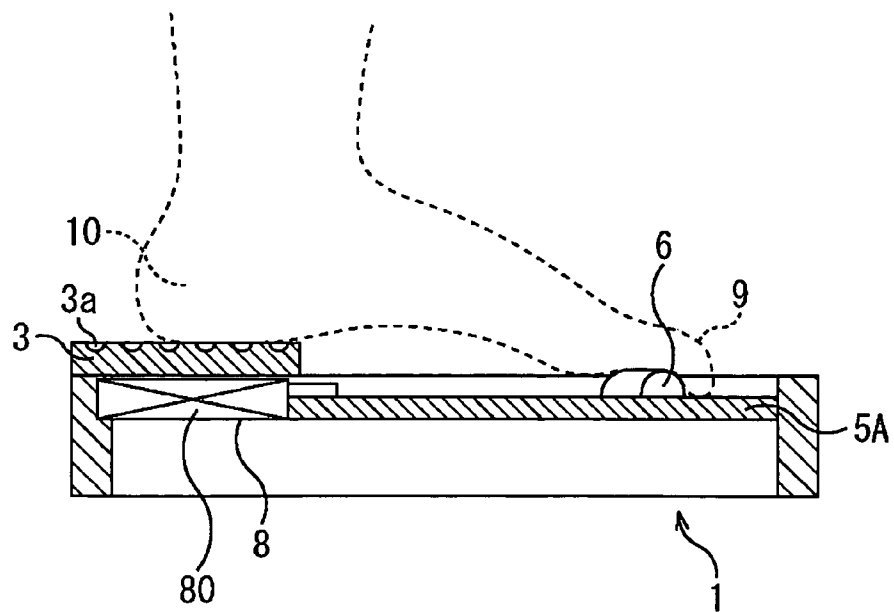


FIG.10

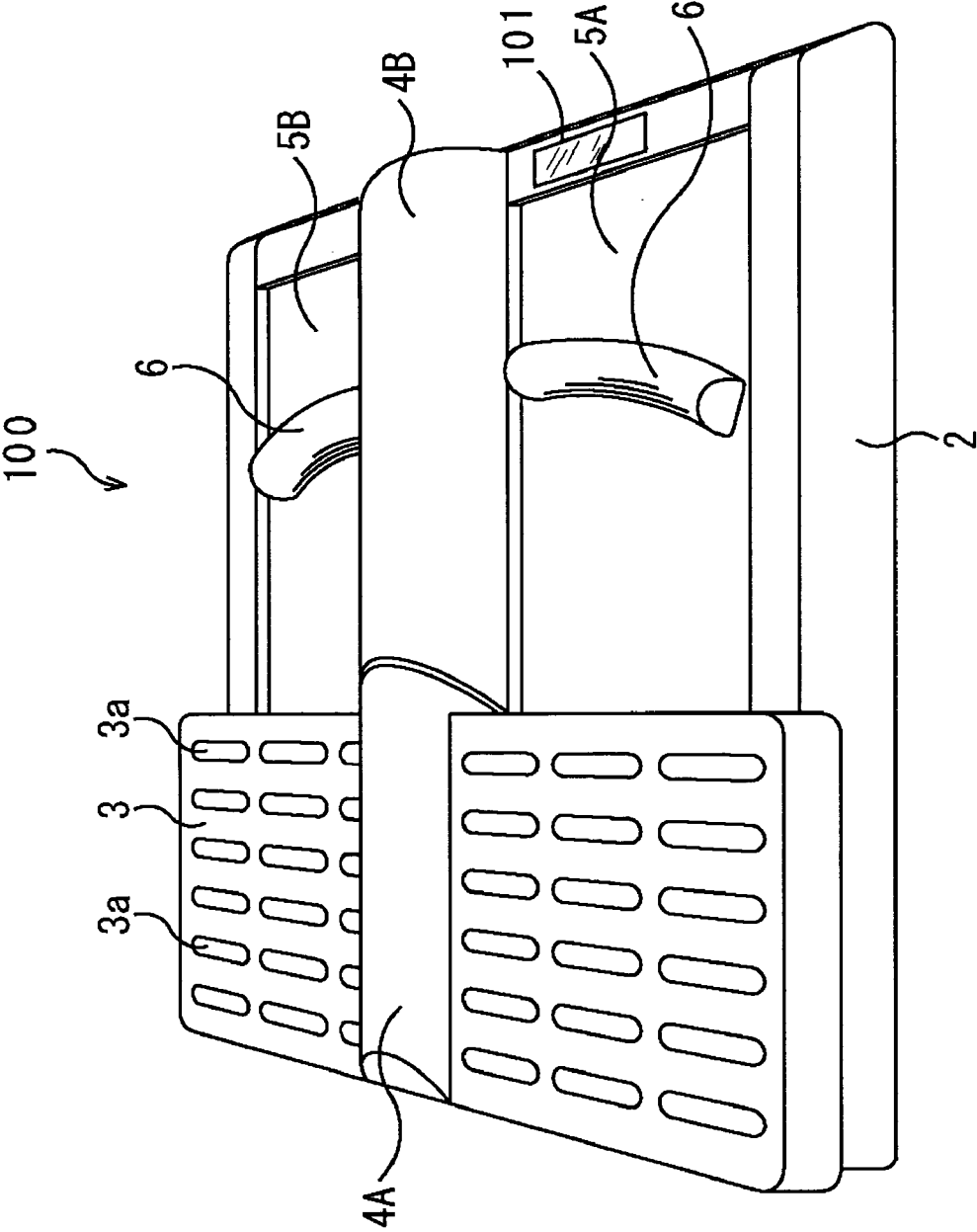
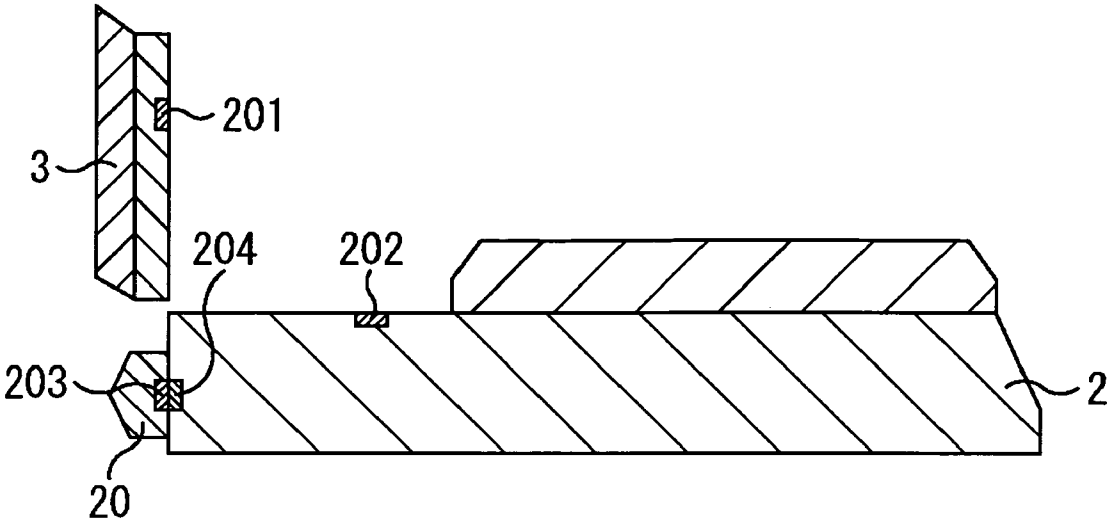


FIG. 11



TOE EXERCISE APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. 2005-230851, filed on Aug. 9, 2005, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] [Field of the Invention]

[0003] The present invention relates to a toe exercise apparatus, in particular, an exercise apparatus which is preferably used to build planter muscle (planter muscle of thumb).

[0004] [Description of the Related Art]

[0005] Generally, nerves of viscera and so-called "trigger points" meet together at soles of feet, and it is said that training and stimulating the soles of feet makes the viscera innervated and health improved. It is also believed that muscle force of thumb is especially important for running ability, jumping ability, instantaneous force and the like which are the basic skill for any sports. This is why many athletes train to build their planter muscle.

[0006] Meanwhile, influences of recent life style and the like have made planter muscle weakened, and generally, more people increasingly have had their foot thumbs with valgus deformities (a symptom that thumb curves in a direction to index finger relative a center line of body). Such valgus deformities are known to have the potential for liver damages, and building up of planter muscle is said to be the most appropriate way to treat and prevent the valgus deformities.

SUMMARY OF THE INVENTION

[0007] One object of the present invention is to provide an apparatus for toe exercise and toe stretch with reduced size at reduced manufacturing cost.

[0008] A toe exercise apparatus according to the present invention comprises: a heel resting board mounted at a rear portion of an outer frame section, the outer frame section being an outer frame of the entire apparatus; a pair of right and left sliding exercise boards mounted in front of the heel resting board and being movable forward and backward relative to the outer frame section; biasing portion for constantly biasing the sliding exercise boards forward; and a convex section disposed on each sliding exercise board at a position corresponding to base portion of a user's toes when the user rests his/her heels on the heel resting board.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a perspective view showing an entire structure of a toe exercise apparatus of a first embodiment according to the present invention;

[0010] FIG. 2 is a view showing a toe exercise apparatus in use with feet on;

[0011] FIG. 3 is a cross sectional view illustrating a configuration of a toe exercise apparatus;

[0012] FIG. 4 is a view illustrating a use of a toe exercise apparatus with right and left toes being stretched;

[0013] FIG. 5 is a view illustrating a use of a toe exercise apparatus with right and left toes being bent;

[0014] FIG. 6 is a cross sectional view illustrating a procedure to tilt a heel resting board;

[0015] FIG. 7 is a perspective view illustrating a tilted heel resting board with Achilles tendon, calf, and planter muscle of thumb being stretched;

[0016] FIG. 8 is a view showing an example provided with measuring portion for measuring toe power;

[0017] FIG. 9 is a cross sectional view showing a second embodiment of the present invention, and schematically illustrate a configuration of a measuring apparatus for measuring toe power; and

[0018] FIG. 10 is a perspective view showing the second embodiment of the present invention, and schematically illustrate a configuration of a measuring apparatus for measuring toe power;

[0019] FIG. 11 is a cross sectional view illustrating a configuration of a toe exercise apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

First Embodiment

[0020] Now, embodiments of a toe exercise apparatus according to the present invention will be explained in detail below with reference to accompanying drawings.

[0021] FIG. 1 is a perspective view showing an entire structure of a toe exercise apparatus 1 of this embodiment. As shown in FIG. 1, the toe exercise apparatus 1 of this embodiment comprises an outer frame section 2 having a rear end of the outer frame shape, and a heel resting board 3 disposed on a rear end of the outer frame section 2. In front of the heel resting board 3, a pair of right and left flat plate-like sliding exercise boards 5A and 5B are provided in the outer frame section 2 which is divided by a central dividing section 4.

[0022] The sliding exercise boards 5A and 5B of this embodiment are slidably fit in a sliding groove 8 (see FIG. 4 and FIG. 5) formed in the inner surface of the outer frame section 2, and slidable in right and left directions of FIG. 1 individually. On each of the sliding exercise boards 5A and 5B, a convex section 6 is formed which engages with base portion of toes. The sliding exercise boards 5A and 5B are constantly biased forward by springs 7 (see FIG. 4 and FIG. 5) so that the front ends of each sliding exercise boards 5A and 5B are in contact with the outer frame section 2 in a free state.

[0023] FIG. 2 shows the toe exercise apparatus 1 of this embodiment in use with left foot LF and right foot RF being on it. As shown in FIG. 1, in using the toe exercise apparatus 1 of this embodiment, the base portions of the right and left toes are brought into contact with the convex sections 6 to pull the convex sections 6 by the right and left toes so that the sliding exercise boards 5A and 5B are slid and pulled.

[0024] As shown in FIG. 2, in this embodiment, the heel resting board 3 on which right and left heels 10 are rested

have a plurality of grooves 3a formed therein. The grooves 3a increase a frictional force between the heel resting board 3 and the heels 10, and prevents slipping of the heels 10 on the heel resting board 3 when the toes 9 are hooked on the convex sections 6 to slide the sliding exercise boards 5A and 5B. The grooves 3a also makes the surfaces of the heel resting board 3 have uneven texture, which stimulates the heels 10 and provides acupressure effects.

[0025] FIG. 3 shows a cross sectional view of the toe exercise apparatus 1. As shown in FIG. 3, the toe exercise apparatus 1 of this embodiment includes the sliding grooves 8 which are formed in the outer frame section 2 and the central dividing section 4 respectively, and into these sliding grooves 8, the right and left sliding exercise boards 5A and 5B are slidably fitted with a play provided therebetween to slidably move forward and backward.

[0026] Below the sliding grooves 8, the springs 7 are provided in a stretched state, and each of the springs 7 has an end locked to the outer frame section 2 and the other end locked to a locking pin 7a which juts out under the lower surface of the sliding exercise boards 5A and 5B. In this embodiment, the sliding exercise boards 5A and 5B have female threaded portions formed therein, and the locking pin 7a has a male threaded portion formed therein, so that the male threaded portion is threadedly engaged with the female threaded portion.

[0027] There are formed a plurality of female threaded portions in the lateral direction of FIG. 4, so that the tension of the springs 7 can be arbitrary adjusted by choosing one of the female threaded portions to be threadedly engaged with the locking pin 7a, and thereby any size of load as desired can be provided to a user. The tension of the springs 7 may be adjusted by any mechanism. The springs 7 constantly bias each of the sliding exercise boards 5A and 5B forward.

[0028] The convex sections 6 formed on the sliding exercise boards 5A and 5B are configured to lock the base portions of the toes 9 of the right and left feet when the user puts his/her weight on them with the heels 10 being on the heel resting sections 3.

[0029] In this embodiment, the members which a user touches such as the outer frame section 2, the heel resting board 3, the central dividing section 4, the sliding exercise boards 5A and 5B are made of natural woods to make the members comfortable to the touch in use. The dividing section 4 serves to hold the sliding exercise boards 5A and 5B and to make the sliding exercise boards 5A and 5B smoothly slide, and also is formed to have a cross sectional shape of a semi-circle to provide a so-called stamp bar (a foot health appliance) when feet are rested on in a perpendicular direction to the dividing section 4, which allows the toe exercise apparatus 1 to be multi-functional in use.

[0030] (First Method to Use)

[0031] Now, a first method to use a toe exercise apparatus 1 of this embodiment having a configuration described above will be explained with reference to FIG. 4 and FIG. 5.

[0032] When a user puts his/her weight on the toe exercise apparatus 1 with the base portions of the toes 9 being hooked on the convex sections 6, a pressure corresponding to the user's weight is applied to his/her feet bottoms. In particular,

acupressure is applied to a plurality of points of the heels 10 due to the plurality of grooves 3a formed in the heel resting board 3. Also, effective acupressure is applied to the base portion of the right and left toes 9 due to the pressing of the convex sections 6 disposed on each sliding exercise boards 5A and 5B against the base portion of toes 9.

[0033] In the above state, when the user bends the right and left toes 9 downward against the bias of the springs, the sliding exercise boards 5A and 5B slide backward (in a direction toward the user), as shown with an arrow Y in FIG. 5 which shows this state.

[0034] When the bent toes 9 are stretched again as they were, the sliding exercise boards 5A and 5B are returned to their original positions by the bias of the springs 7. The repetition of this bending and stretching of the toes 9 with the reciprocation of the sliding exercise boards 5A and 5B over a stroke length L as shown provides training to build planter muscle. In this embodiment, the number of the reciprocation is counted by a sensor S of a counting apparatus mounted on the outer frame section 2 by detecting the locking pins 7a of the springs 7 mounted on the sliding exercise boards 5A and 5B, the result of which will be displayed on a display section 30.

[0035] According to the toe exercise apparatus 1 of this embodiment, in order to slide the sliding exercise boards 5A and 5B by the bending/stretching exercise of the toes 9, since a significantly large power against the tension of the springs 7 is required to repeatedly bend the toes 9, planter muscle, especially, planter muscle of thumb can be extremely effectively built up.

[0036] Therefore, when athletes continue a training of about 200 times a day using the toe exercise apparatus 1 with a stroke length L of about one inch, they can significantly build up the planter muscle of thumb in a short period, resulting in a significant build up of running ability, jumping ability, instantaneous force and the like which are the basic skills for any sports.

[0037] Meanwhile, when the training board is used as a daily health appliance, not only the training contributes to improvement of the basic physical strength, the training is extremely effective to treatments and correction of the valgus deformities and flat foot, and as the soles of fee are stimulated and the planter muscle is built up, the viscera is innervated so that better health can be achieved.

[0038] (Second Method to Use)

[0039] The toe exercise apparatus 1 of this embodiment includes a tilting mechanism. That is, as shown in FIG. 6, the heel resting board 3 of this embodiment is liftably attached at its rear end portion to the outer frame section 2 via a hinge mechanism 60.

[0040] As shown in FIG. 4 and FIG. 5, a fitting hole 2a is formed in the outer frame section 2 which is positioned at the rear portion of the toe exercise apparatus 1. With the fitting projection 21 being fitted into the fitting hole 2a, an angle adjusting stopper 20 is removably attached to the outer frame section 2.

[0041] The angle adjusting stopper 20 has fitting holes 20a formed in its bottom and side. On the other hand, the outer frame section 2 has fitting projections 2b on its upper surface. The angle adjusting stopper 20 is configured to be

fixed on the upper surface of the outer frame section 2 by fitting the fitting projection 2b into the fitting hole 20a with the heel resting board 3 being lifted up.

[0042] As described above, when the heel resting board 3 is pushed down with the angle adjusting stopper 20 being fixed on the outer frame section 2, as shown in the perspective view of FIG. 7, the heel resting board 3 is tilted at a predetermined angle relative to the outer frame section 2. When a user puts his/her tiptoes on the heel resting board 3 and transfers his/her weight to the tiptoes with the heels 10 being remained on the floor, his/her Achilles tendon, calf and planter muscle of thumb can be stretched.

[0043] FIG. 6 shows the angle adjusting stopper 20 mounted by fitting the fitting hole 20a formed in the bottom of the angle adjusting stopper 20 with the fitting projection 2b formed on the outer frame section 2, but the heel resting board 3 may be tilted at a wider angle when the fitting hole 20a formed in a side of the angle adjusting stopper 20 (not shown) is fitted with the fitting projection 2b.

[0044] As described above, in the toe exercise apparatus 1 of this embodiment, the heel resting board 3 has a surface having a plurality of grooves 3a formed therein. The grooves 3a increase a frictional force between the heel resting board 3 and a user's feet bottoms in stretching Achilles tendon, calf, planter muscle of thumb and the like. Also, in transferring a user's weight to his/her feet bottoms for the stretching, the uneven texture of the grooves 3a is pressed against his/her feet bottoms to stimulate them. The stimulation promotes recovery from general fatigue, warm-up exercises for sports, recovery from muscular pain, and the like, and provides an advantage to allow the toe exercise apparatus 1 to be multi-functional in use.

[0045] The above described embodiment shows a basic configuration of the toe exercise apparatus 1 according to the present invention, and various functions may be added to the toe exercise apparatus 1 other than those described above.

[0046] For example, measuring portion 80 for measuring toe power may be mounted on the toe exercise apparatus 1. If the measuring portion 80 is mounted, as shown in FIG. 8, the measuring portion 80 is removably mounted between the outer frame section 2 and the sliding exercise boards 5A and 5B. The measuring portion 80 may be mechanical measuring apparatus or electrical measuring apparatus (for example, an apparatus having a piezo-electric device) both of which are known, and so the measuring portion 80 will not be explained in detail below. FIG. 1 shows an example provided with a displaying apparatus 101 on the outer frame 2 for displaying a result measured by the measuring portion 80.

[0047] As described above, the measuring portion for measuring toe power makes it possible for a user to recognize an improved athletic ability of planter muscle and the like as a numeric value after the toe exercises using the toe exercise apparatus of the present invention, which serves as an encouragement to the user for the toe exercise, and is effective to make the user continue the toe exercise.

[0048] In the above described embodiment, the heel resting board 3 has a plurality of grooves 3a formed therein to provide uneven texture on the surface of the heel resting board 3. Alternatively, the surface of the heel resting board 3 may be provided with a plurality of convex portions to

provide uneven texture. Forming a plurality of grooves 3a or a plurality of convex portions in or on the heel resting board 3 made of wood requires considerable efforts, and leads to a higher manufacturing cost, and so, a synthetic resin sheet, rubber sheet or the like with uneven texture may be attached to the surface of the heel resting board 3 so that the surface of the heel resting board 3 can be provided with the uneven texture.

[0049] As described above, since the toe exercise apparatus according to the present invention has a simple configuration as an exercise apparatus for both toe exercise and toe stretch, an apparatus for both toe exercise and toe stretch with reduced size at reduced manufacturing cost can be achieved. In this way, a toe exercise apparatus can be provided which not only improves the basic ability of athletes, but also are readily available to general users.

Second Embodiment

[0050] Now, a second embodiment of the present invention will be explained in detail below with reference to FIG. 9 and FIG. 10. The measuring portion 80 illustrated in FIG. 8 for measuring toe power is an example which is incorporated in the toe exercise apparatus 1.

[0051] To the contrary, in this embodiment, a measuring portion 100 for measuring toe power is a single unit which is separate from the toe exercise apparatus. Specifically, the heel resting board 3 is not an element to be lifted up, and in this context, the angle adjusting stopper 20, the fitting hole 20a, and the fitting projection 2b are not included. Moreover, the spring 7 and locking pin 7a are not included, neither.

[0052] A displaying apparatus for displaying a measured result to a user may be disposed at any position on a surface of the measuring apparatus 100. For example, FIG. 10 shows an example in which a displaying apparatus 101 is disposed on a surface of the front portion of the outer frame 2. The displaying apparatus 101 may be any mechanical, electrical, or other style of displaying apparatus, depending on the type of measuring portion 80.

[0053] With this configuration, in an exercise facility where a plurality of the toe exercise apparatuses 1 are used, one measuring apparatus 100 is to be provided for the apparatuses. This configuration eliminates user's effort to attach and remove the spring 7 and measuring portion 80, since a user can use the measuring apparatus 100 which is for measuring purpose only when the user wants to measure toe power.

[0054] The measuring apparatus 100 of this embodiment has a structure similar to that of the toe exercise apparatus 1, and this provides an advantage that toe power can be measured with a user being in the position similar to that during toe exercise. Thus, conveniently, a user can know the result of toe exercise without fail by using the measuring apparatus 100 with the toe exercise apparatus 1.

[0055] In the above described each embodiment, as shown in FIG. 11, magnet 201 and 202 for holding an outer frame section 2 and a heel resting board 3 with magnetic force may be mounted on the toe exercise apparatus 1(100). Furthermore magnet 203 and 204 for holding an outer frame section 2 and an angle adjusting stopper 20 with magnetic force may be mounted on the toe exercise apparatus 1(100).

