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(54) **EXERCISE ASSISTING TOOL**

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(57) **ABSTRACT**

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(2), (4) Date: **Nov. 6, 2012**

An exercise assisting tool includes a seating surface on which a user is seated, and a body portion having a bottom surface formed in a substantially spherical shape. A height H of the seating surface at a lowermost point is set in a range from 100 mm to 450 mm, and a regulator is further provided to suppress any slippage of buttocks of the user from the seating surface. The exercise assisting tool is structured so that the user seated on the seating surface is allowed to tilt the seating surface in all directions while having the bottom surface in contact with the ground surface.

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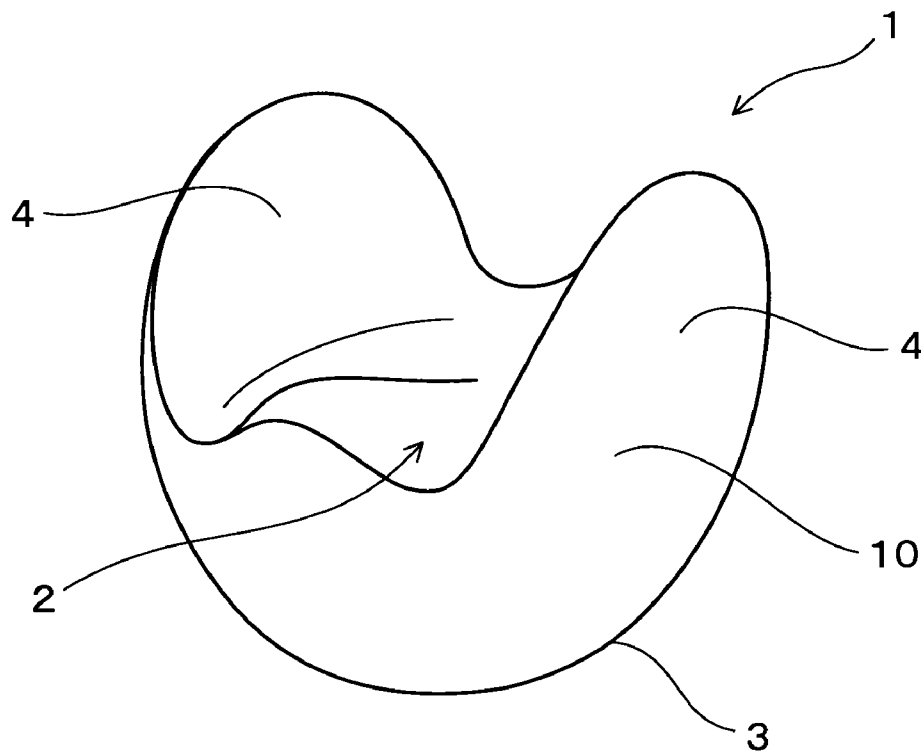


FIG. 1

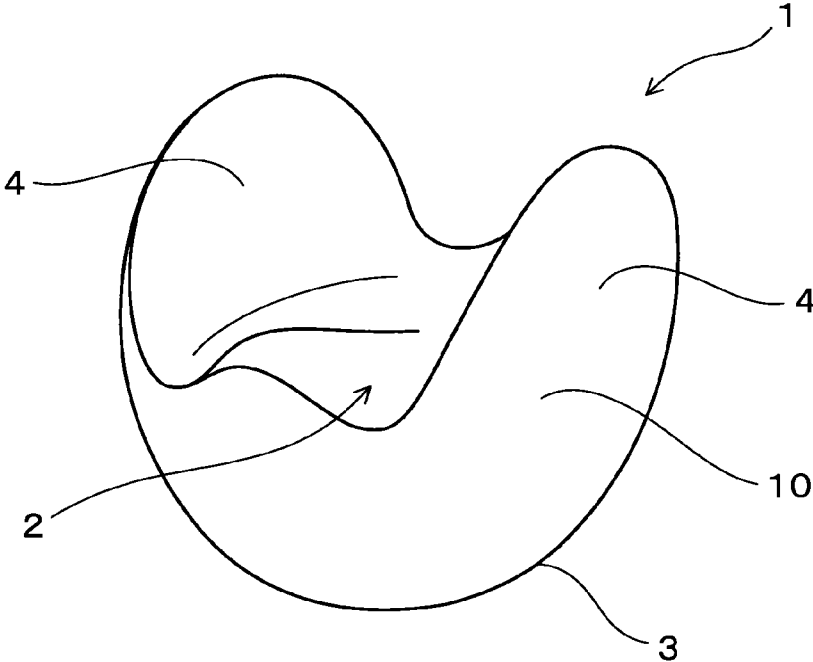


FIG. 2

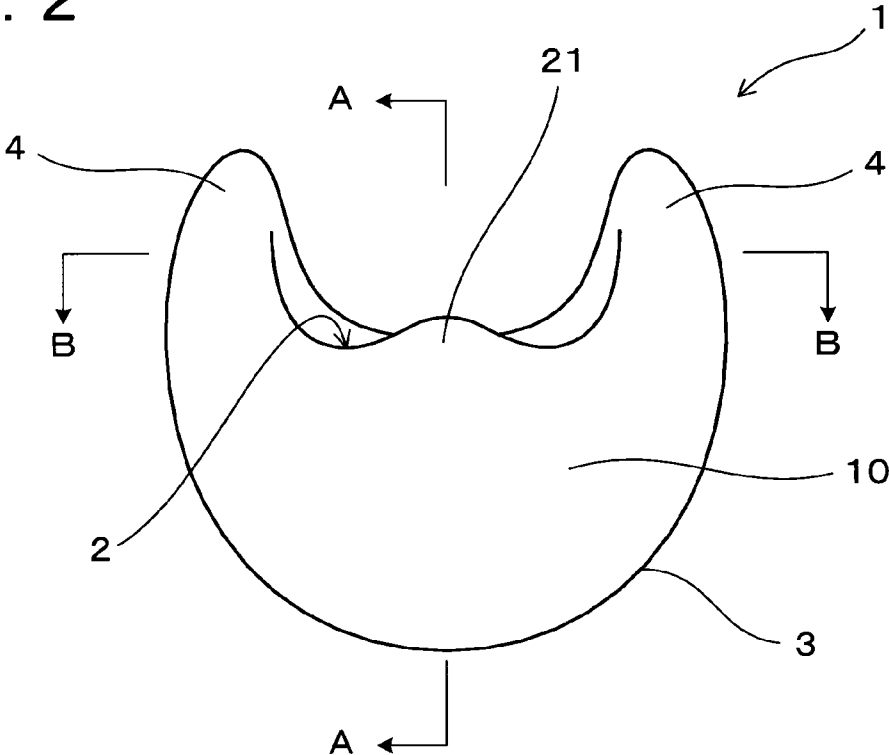


FIG. 3

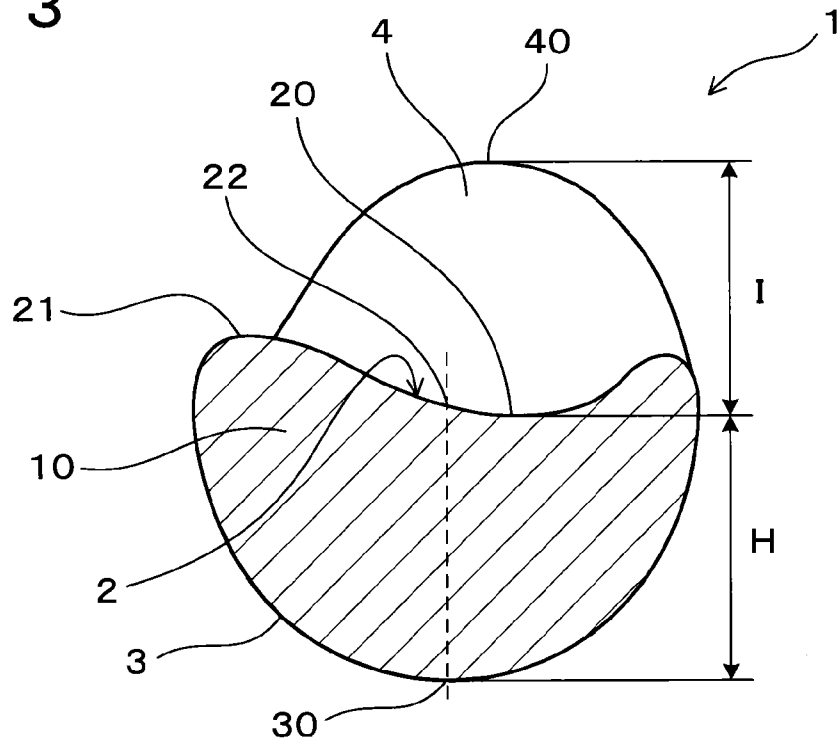


FIG. 4

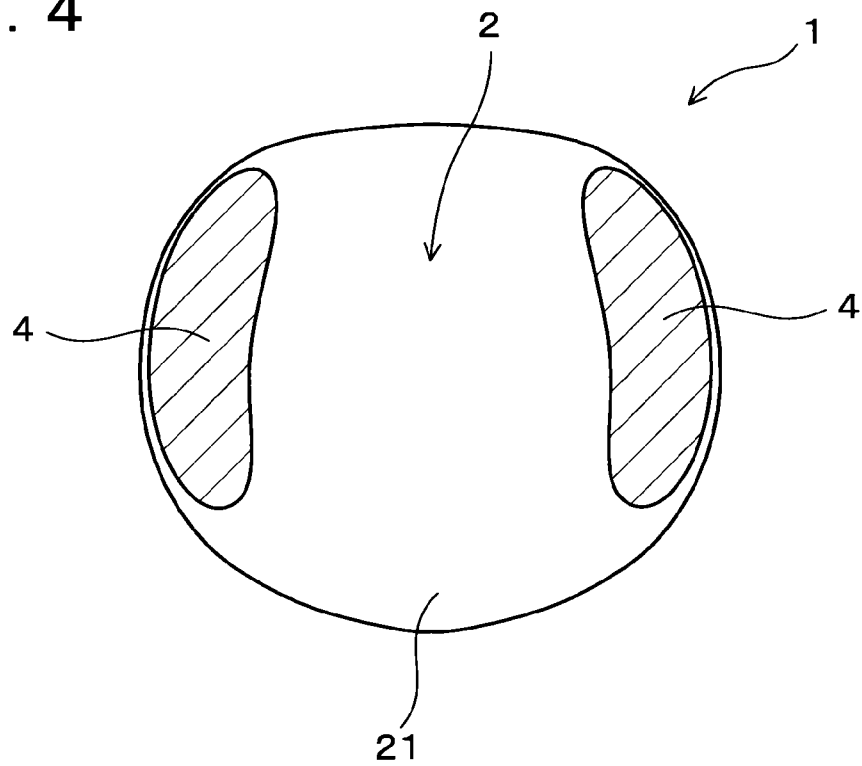


FIG. 5

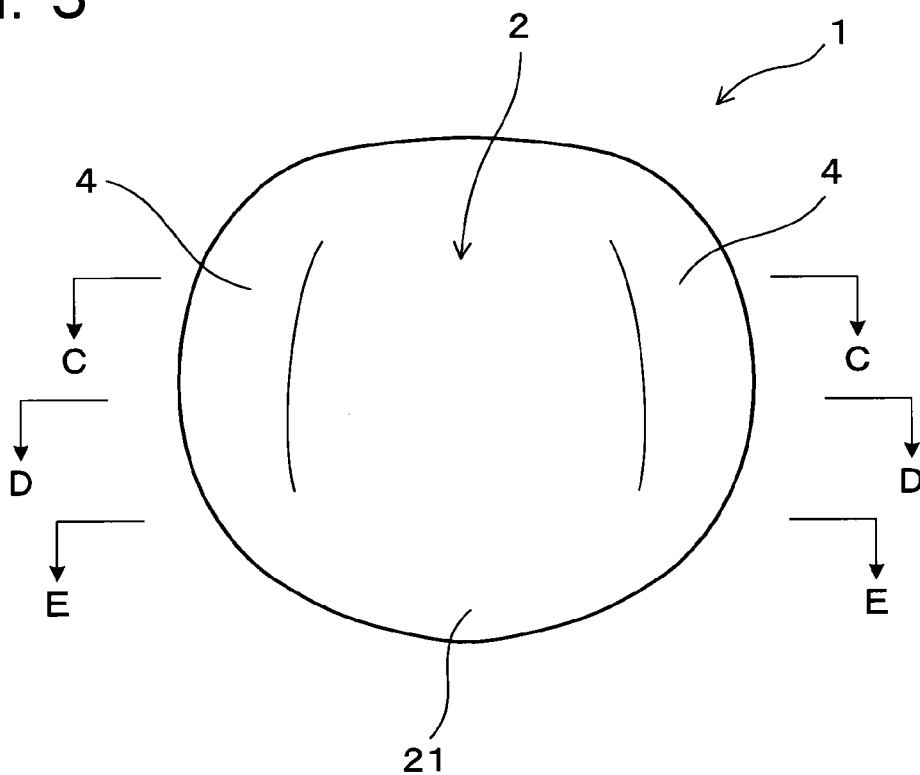


FIG. 6

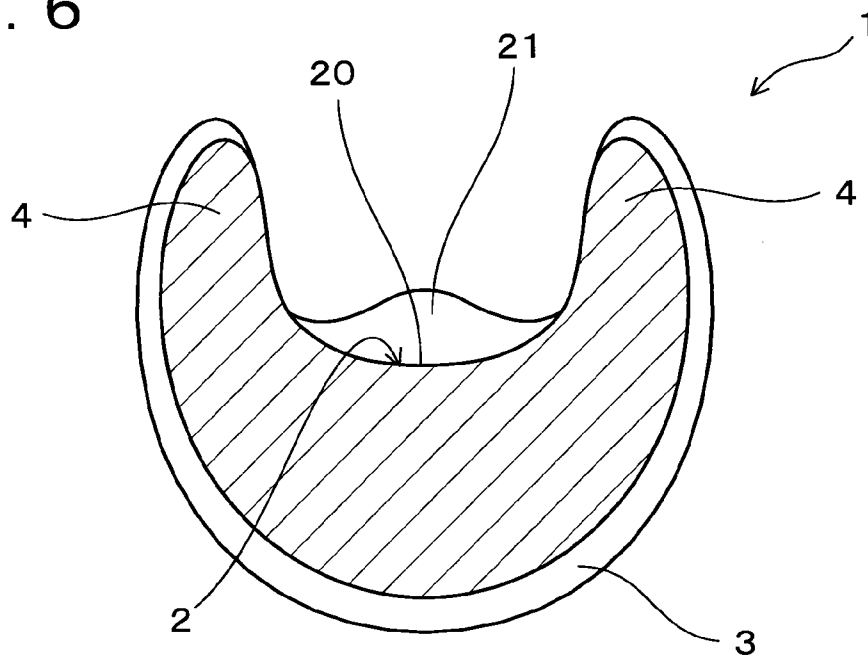


FIG. 7

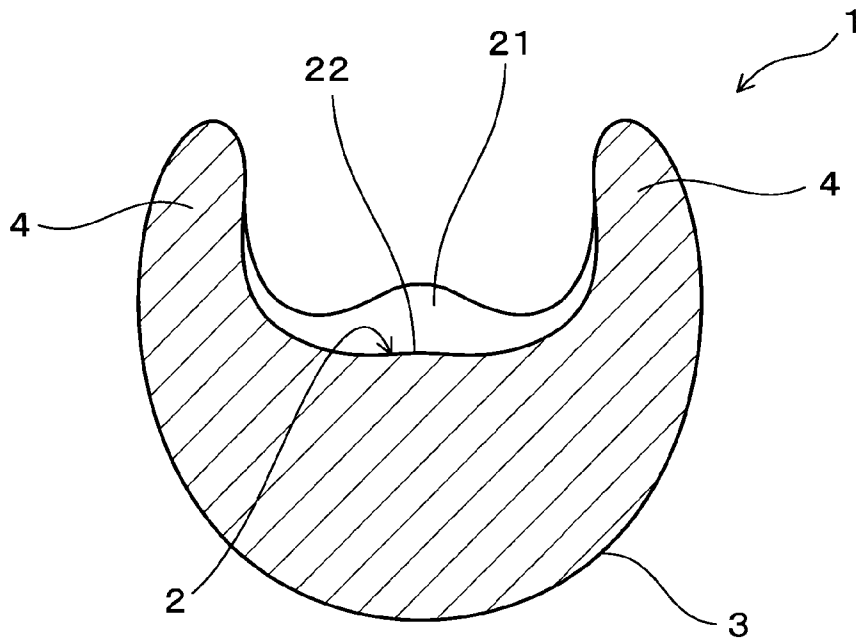


FIG. 8

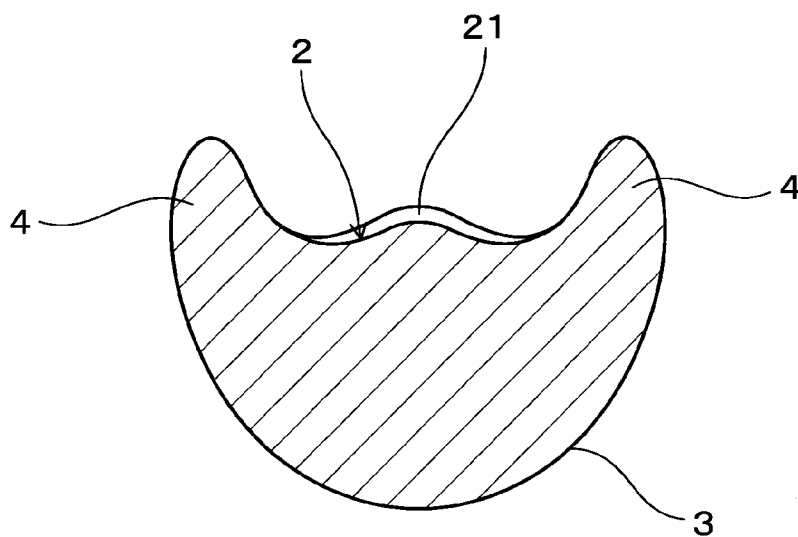


FIG. 9

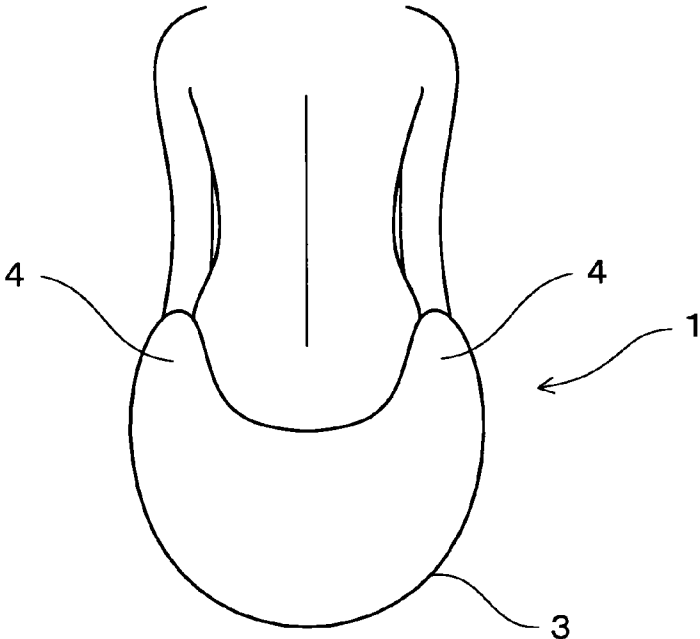


FIG. 10

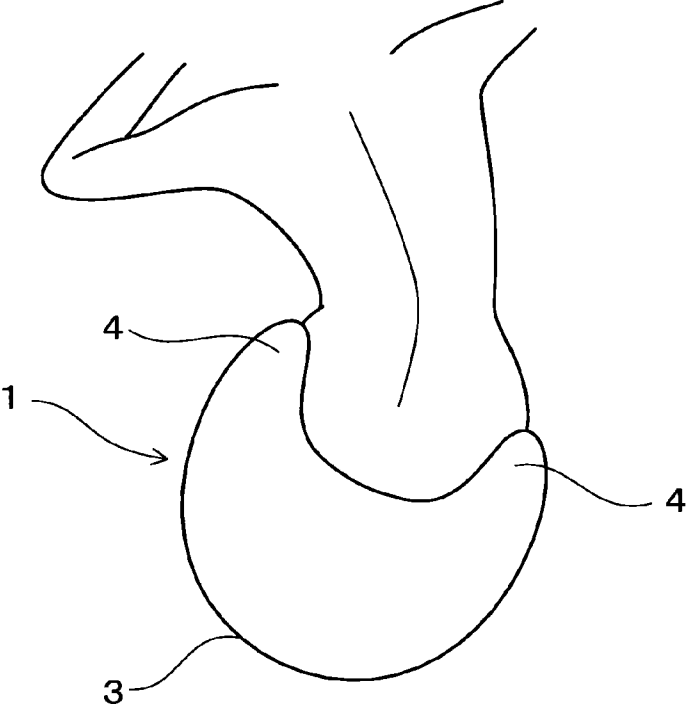


FIG. 11

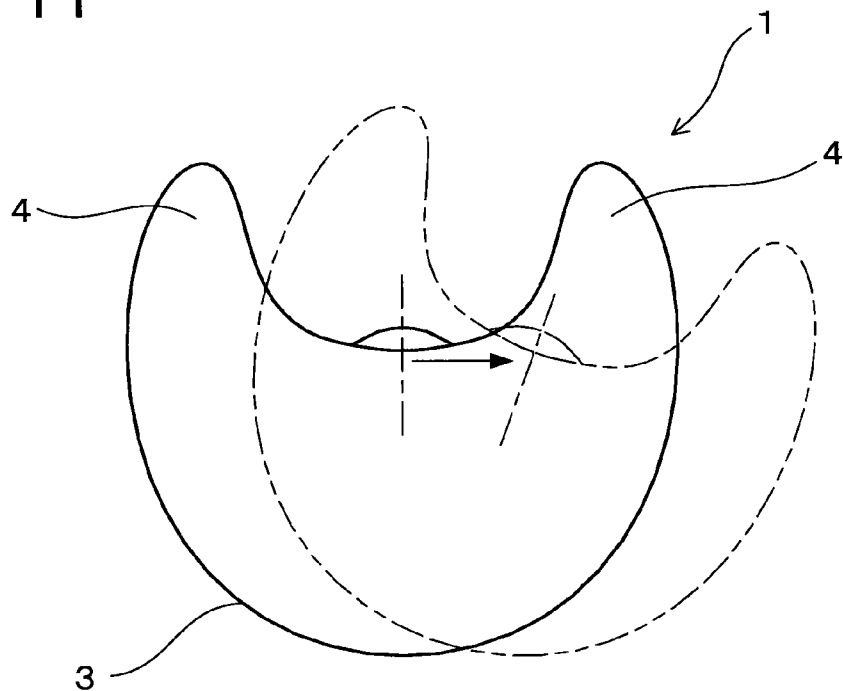


FIG. 12

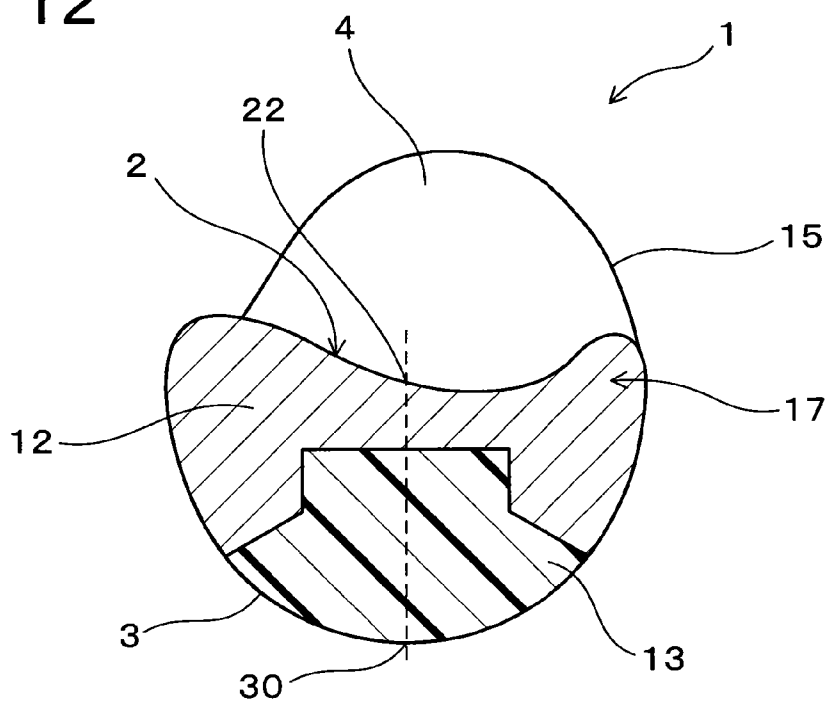


FIG. 13

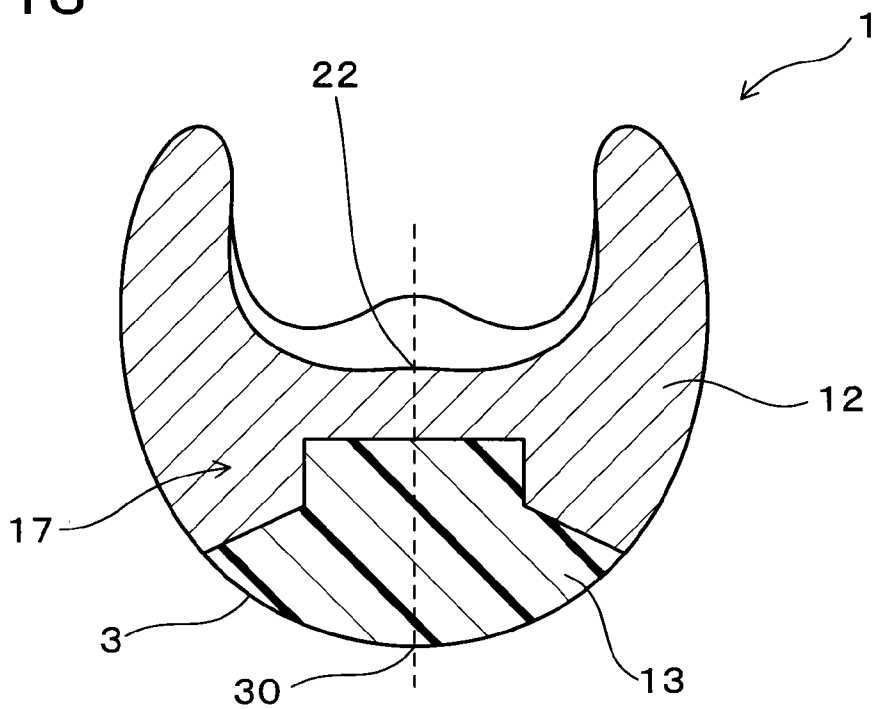


FIG. 14

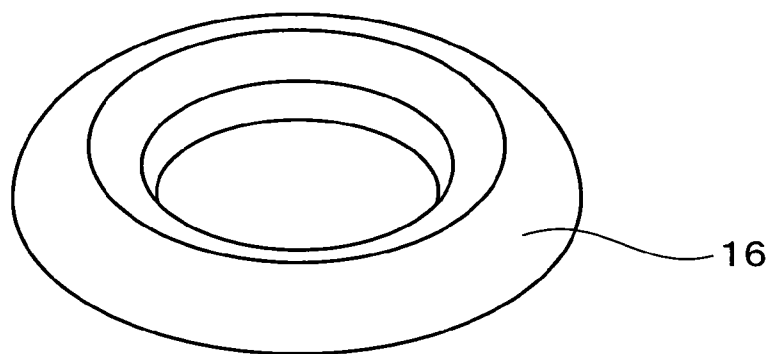


FIG. 15

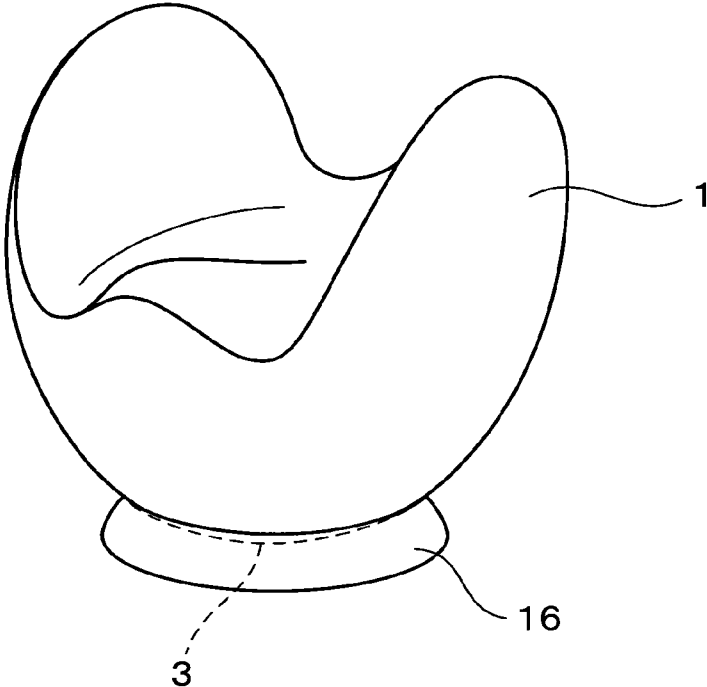


FIG. 16

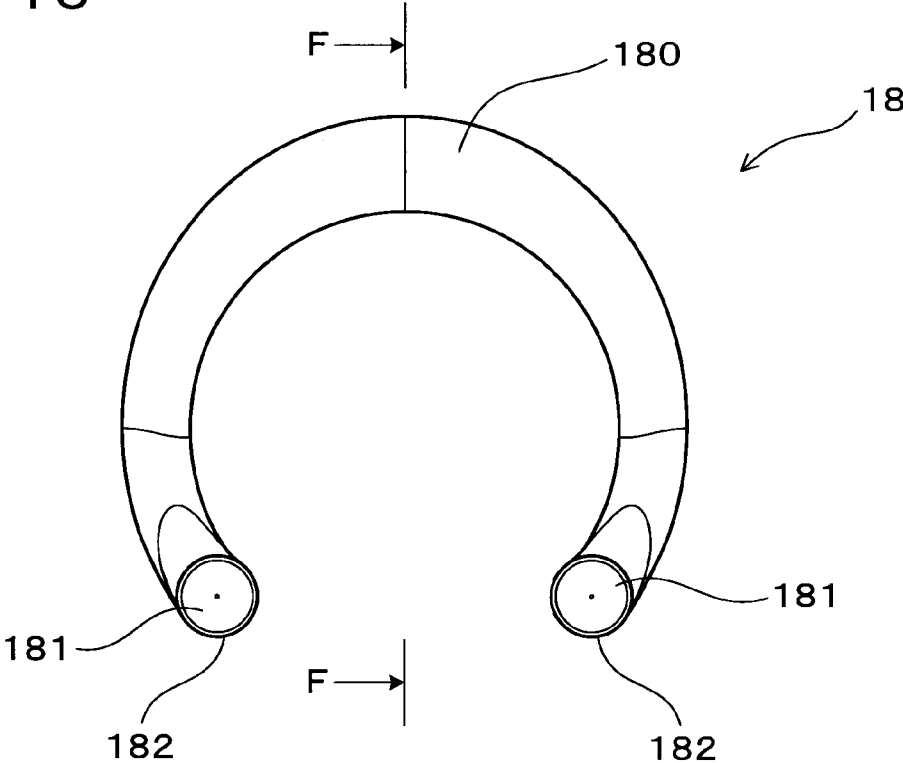
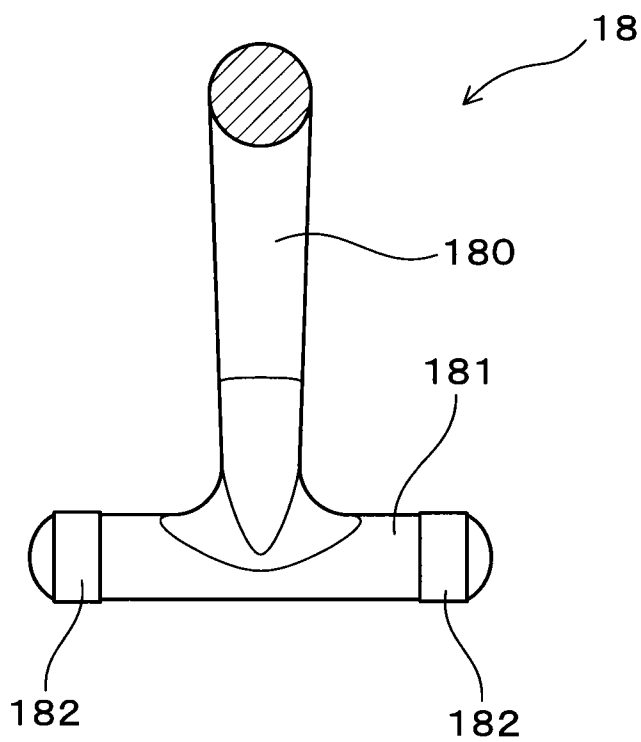


FIG. 17



EXERCISE ASSISTING TOOL

FIELD OF THE INVENTION

[0001] The invention relates to an exercise assisting tool.

BACKGROUND OF THE INVENTION

[0002] A number of different exercises have been introduced these days to maintain physical appearance and wellness, and a variety of exercise assisting tools have been proposed in accordance with the respective types of exercises so as to further improve effects of the exercises. The Patent Document 1 discloses an exercise assisting tool used to assist a user in performing an exercise involving rotational motion and twisting of the waist. The exercise assisting tool having a body portion formed in a spinning top-like shape assists the user seated on an upper surface of the body portion in the exercise, for example, rotational motion of the waist and the like.

PRIOR ART DOCUMENT

Patent Document

[0003] Patent Document 1: JP Application Publication No. 09-135921

SUMMARY OF THE PRESENT INVENTION

Problem to be Solved by the Invention

[0004] However, it is not easy to largely tilt the body portion of the exercise assisting tool. Therefore, the radius of rotation of the user's waist upon exercise of rotational motions is reduced, failing to do the exercise effectively. When using the exercise assisting tool, the user needs to sit down nearly to a ground level, which may impose a burden on the lower back of the user.

[0005] It is further disclosed in the Patent Document 1 that the exercise assisting tool may be placed on a pedestal to alleviate any physical burden on the user when sitting thereon. However, it may be troublesome for the user to prepare such a pedestal for the exercise assisting tool to be placed on. In the case where the user uses the exercise assisting tool placed on the pedestal, it is not easy to largely tilt the body portion as described above. It is difficult to solve the problem of incapability of effective exercise.

[0006] The present invention made on the background as described above provides an exercise assisting tool that is easy to use and ensures improvement in the effect of the lower back exercise.

Means for Solving Problems

[0007] According to an aspect of the invention, an exercise assisting tool includes a seating surface on which a user is seated, and a body portion having a bottom surface formed in a substantially spherical shape. A height of the seating surface at a lowermost point is in a range from 100 mm to 450 mm. A regulator means is provided to suppress any slippage between buttocks of the seated user and the seating surface.

Effect of the Invention

[0008] The exercise assisting tool is configured such that the height of the seating surface at the lowermost point is in the specific range as described above, and the bottom surface

has a substantially spherical shape. The exercise assisting tool allows the user to tilt the seating surface in all directions with the bottom surface that is kept in contact with the ground by moving the waist relative to the feet on the ground as a base point while being seated on the exercise assisting tool. Further, the exercise assisting tool with the height of the seating surface in the specific range, ensures a large movable range of the tilting seating surface. This allows a movable range of the user's waist to be broadened. Therefore, the user increases the radius of rotation of the waist by the use of the exercise assisting tool to allow muscles of the waist to be twisted more effectively during the exercise.

[0009] The exercise assisting tool includes regulator means to prevent slippage of the user's buttocks from the seating surface. This eliminates the need for the user to hold the exercise assisting tool with hands during the exercise. The exercise assisting tool ensures sufficient exercising effect in the waist by a synergy effect derived from both the predefined height range of the seating surface and the regulator means.

[0010] The height of the seating surface set in the predefined range may alleviate any physical burden on the user who is seated thereon. Because of these advantages, the exercise assisting tool is very easy for the user to use.

[0011] As described above, the exercise assisting tool according to the aspect is easy to use and assists a user in effective exercise.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a perspective view of an exercise assisting tool according to a first embodiment;

[0013] FIG. 2 is a plan view of the exercise assisting tool according to the first embodiment seen from the side of a raised portion (from a front side);

[0014] FIG. 3 is a sectional view taken along line A-A illustrated in FIG. 2;

[0015] FIG. 4 is a sectional view taken along line B-B illustrated in FIG. 2;

[0016] FIG. 5 is a plan view of the exercise assisting tool according to the first embodiment seen from the side of a seating surface (from an upper side);

[0017] FIG. 6 is a sectional view taken along line C-C illustrated in FIG. 5;

[0018] FIG. 7 is a sectional view taken along line D-D illustrated in FIG. 5;

[0019] FIG. 8 is a sectional view taken along line E-E illustrated in FIG. 5;

[0020] FIG. 9 is a plan view seen from a rear side of the exercise assisting tool according to the first embodiment where a user is seated thereon;

[0021] FIG. 10 is a plan view seen from a rear side in a state where a user is exercising with the exercise assisting tool according to the first embodiment;

[0022] FIG. 11 is a plan view of the exercise assisting tool according to the first embodiment, which tilts toward a lateral side portion;

[0023] FIG. 12 is a sectional view of an exercise assisting tool according to a second embodiment, in which different materials are used to form a seating surface member and a bottom surface member (sectional view corresponding to FIG. 3);

[0024] FIG. 13 is a sectional view of the exercise assisting tool according to the second embodiment, in which different

materials are used to form the seating surface member and the bottom surface member (sectional view corresponding to FIG. 7;

[0025] FIG. 14 is a perspective view of a support stand according to a fourth embodiment;

[0026] FIG. 15 is a perspective view of an exercise assisting tool according to the fourth embodiment where a support stand is interposed between a ground contact surface and a ground surface;

[0027] FIG. 16 is a perspective view of support handles according to a fifth embodiment; and

[0028] FIG. 17 is a sectional view of the support handles taken along line F-F illustrated according to the fifth embodiment.

EMBODIMENTS FOR CARRYING OUT THE INVENTION

[0029] The height of the seating surface of the exercise assisting tool is defined by measuring a height of the seating surface at a lowermost point from a ground surface while having the bottom surface in contact with the ground surface such that a center portion of the seating surface is located vertically upward from a ground contact point. The height of the seating surface thus defined is substantially equal to a height of a lowermost point of the user's buttocks from the ground surface when the user is seated on the seating surface while having the back straightened.

[0030] The height of the seating surface (lowermost point) is at least 100 mm to at most 450 mm. According to the exercise assisting tool, the height of the seating surface is set to be in the predefined range. This allows the user's waist to be appropriately apart from the ground surface. Accordingly, the user seated on the exercise assisting tool can easily tilt the seating surface by moving the waist while having the feet in contact with the ground. This broadens a movable range of the user's waist, thus increasing a degree of freedom of rotating motion of the waist. As a result, the exercise assisting tool can achieve a better exercising effect for the user's waist. Further, the seating surface with the suitably adjustable height allows the user to sit down on the exercise assisting tool effortlessly.

[0031] The height of the seating surface smaller than 100 mm makes it difficult for the user to sit down on the seating surface. Additionally, the seating surface and the ground surface are too close to provide sufficient effect of the exercise because of a narrow movable range of the user's waist. Therefore, the height of the seating surface is set to at least 100 mm, preferably at least 140 mm, and more preferably at least 160 mm.

[0032] In the case where the height of the seating surface is larger than 450 mm, the user's waist is too distant from the ground level, making it difficult for the user to move the waist in a well-balanced manner because of elevated center of gravity. Then, it becomes difficult for the user to smoothly move the waist using the exercise assisting tool, resulting in insufficient exercising effect. To avoid the problem, the height of the seating surface is at most 450 mm, preferably at most 350 mm, more preferably at most 300 mm, and even more preferably at most 200 mm. In view of a desirable movable range of the user's waist and easy balancing, it is particularly desirable that the height of the seating surface be at least 160 mm to at most 200 mm.

[0033] It is necessary that the body portion be produced from a material that substantially prevents the bottom surface from deforming when the user is seated on the seating sur-

face. This ensures the exercise assisting tool to reliably retain the height of the seating surface and the user to smoothly tilt the seating surface by taking advantage of the bottom surface shape.

[0034] The shape of the body portion is not particularly limited so long as the tilting motion of the seating surface is not obstructed. A variety of shapes of the body portion are available, for example, a substantially semi-spherical overall shape formed by a smoothly curved surface continuous to the bottom surface, and a cuboidal shape having a surface thereof formed in a substantially spherical shape so as to be used as the bottom surface. As far as the bottom surface is formed in a substantially spherical shape, shapes of any other parts of the body portion are not particularly limited.

[0035] The substantially spherical shape indicating the shape of the bottom surface is not geometrically perfect spherical shape but is a conceptual expression of the shape including any shapes visually recognized as spherical in general. The bottom surface may have a portion having a different curvature as far as the tilting motion is smoothly performed in all directions. For example, the curvature radius of the bottom surface may not be uniform but is reduced toward a peripheral edge thereof. Alternatively, the bottom surface may not be rotated symmetrically about a center axis, while having different curvature radii in two directions orthogonal to each other.

[0036] The regulator means may be provided in various aspects. The simplest aspect of the regulator means is realized by producing the seating surface formed of a material with a high coefficient of friction so as to suppress any slippage between the user's buttocks and the seating surface under the frictional force.

[0037] Another aspect of the regulator means is formed by providing a shape-change portion on the seating surface or a peripheral area thereof, which has its shape in accordance with a shape of at least a part of the buttocks, waist, or groin of the user seated on the seating surface. This makes it possible to support the buttocks, waist, or groin by taking advantage of the shape so that the slippage between the user's buttocks and the seating surface is suppressed.

[0038] Still another aspect of the regulator means is realized by producing the seating surface from a material easily deformable along the shape of the user's buttocks or groin thereon, for example, a low-resilient elastic foam, such that the buttocks is fit with the seating surface more closely, and accordingly, the slippage therebetween is suppressed. These different aspects are applicable in combination.

[0039] A pair of lateral side portions may be provided as the regulator means at positions corresponding to sides of a pelvic part of the user seated on the seating surface, which stand upright having the seating surface interposed therebetween. In this case, the exercise assisting tool provided with the pair of lateral side portions suppresses slippage between the user's buttocks and the seating surface, thus helping the user's pelvic part in follow-up of the movement of the seating surface. While exercising by rotating the waist, the exercise assisting tool is likely to form an angle between the pelvic part and the waist, assisting the user in twisting muscles of the waist more effectively. As a result, the exercise assisting tool achieves a better exercising effect.

[0040] The lateral side portions may be configured to have plastic properties, and to laterally apply a pressing force to the pelvic part of the user seated on the seating surface. In this case, the exercise assisting tool provided with the lateral side

portions allows the user's pelvic part to be supported with the pair of lateral side portions. This makes the user's pelvic part better fit the seating surface, allowing the pelvic part to follow up the movement of the seating surface. Then, the user can even more effectively twist muscles of the waist using the exercise assisting tool, thus further improving the exercising effect.

[0041] Preferably, a height of the lateral side portion measured from the lowermost point of the seating surface to an uppermost point of the lateral side portion is in a range from 100 mm to 250 mm. The exercise assisting tool having the height of the lateral side portions in the predefined range can effectively support the user's pelvic part in a stable manner and also allow the user to smoothly perform the exercise without interfering with the rotational movement of the waist, thus further improving the exercising effect.

[0042] In the case where the height of the lateral side portion is smaller than 100 mm, the exercise assisting tool may fail to stably support the user's pelvic part as effectively as expected. Therefore, the height of the lateral side portion is set to at least 100 mm, preferably at least 120 mm, and more preferably at least 140 mm. In the case where the height of the lateral side portion exceeds 250 mm, the lateral side portion may interfere with the smooth exercise. Therefore, the height of the lateral side portion is set to at most 250 mm, preferably at most 200 mm, and more preferably at most 180 mm.

[0043] The seating surface may be configured to have a raised portion raised from a periphery thereof, which serves as the regulator means in a center of the seating surface at a front-end side. In this case, the raised portion is formed along the shape of the user's groin. The seating surface is shaped to ensure suppression of slippage between the user's buttocks and the seating surface. Further, the seating surface facilitates to adjust the seating location to the position that allows effective exercise.

[0044] The body portion has a core body and an outer surface member which covers the core body. The core body includes a bottom surface member located at the bottom surface side, and a seating surface member located at the seating surface side, which are formed by using different materials, respectively. This allows the bottom surface member to have a hardness degree greater than that of the seating surface member. The bottom surface member is formed of a relatively hard material so as to suppress the bottom surface from sinking under the user's weight. This may facilitate the exercise assisting tool to retain the substantially spherical shape of the bottom surface. The exercise assisting tool, having the seating surface member produced from a relatively flexible material, alleviates the physical burden on the user's waist and allows the user's body to more comfortably fit in the seating surface.

[0045] The material for forming the bottom surface member may be made highly resistant against the burden to the waist of the user so as not to be deformed under the user's weight, for example, plastics such as polyurethane and polystyrene, and expandable plastics such as hard polyurethane foam and polystyrene foam.

[0046] As the material of the seating surface member, expandable plastics having plasticity such as flexible polyurethane foam may be employed. When a material easily deformable under the user's weight, for example, low-resilient elastic foam, is used to form the seating surface member, the seating surface member is allowed to function as the regulator means as well. Though the seating surface member

may be largely deformed by the user seated thereon, the exercising effect can be improved as far as the height of the deformed seating surface (lowermost point) is in the range from 100 mm to 450 mm.

[0047] The outer surface member provided for the exercise assisting tool serves to suppress wear resulting from the use of the exercise assisting tool. As the outer surface member, a fabric material and a coating material may be employed. Preferably, the outer surface member provided near the bottom surface is made of a material having a relatively high wear resistance.

[0048] The exercise assisting tool preferably has a center of gravity set at a position where the seating surface is directed upward when the exercise assisting tool is left by itself. This allows the user to minimize the action to adjust the direction before using the exercise assisting tool. This may eliminate a large action, for example, the one for vertically reversing the exercise assisting tool. Further, the user is allowed to readily balance on the seating surface directed upward. The resultant exercise assisting tool becomes easier to use.

[0049] Preferably, a curvature radius of the bottom surface is in a range from 130 mm to 250 mm. The exercise assisting tool, having the curvature radius of the bottom surface in the predefined range, is capable of regulating the tilt of the seating surface in the movable range of the user's waist to a titling range suitable to the exercise. More specifically, the exercise assisting tool is capable of regulating the tilt of the seating surface to a range that is sufficiently wide to enhance the effect of the rotational motion and allows the user to balance easily.

[0050] If the curvature radius of the bottom surface is below 130 mm, there may be the risk of excessively increasing the tilt of the seating surface in the movable range of the user's waist. Therefore, the curvature radius of the bottom surface is preferably set to at least 130 mm, more preferably at least 150 mm, and further preferably at least 160 mm. On the other hand, if the curvature radius of the bottom surface exceeds 250 mm, the tilt of the seating surface is likely to be insufficient. This may cause the risk of reducing the exercising effect in the rotational motion of the waist, for example. Therefore, the curvature radius of the bottom surface is preferably set to at most 250 mm, more preferably at most 230 mm, and further preferably at most 220 mm.

[0051] A radius of a virtual circle may be used to express the curvature radius of the bottom surface. First, a reference axis extending vertically through a ground contact point of the bottom surface is defined. Next, two points on the bottom surface vertically distant by 50 mm from the ground contact point are defined on a longitudinally sectional surface of the body portion including the reference axis. Then, a radius of the virtual circle passing through three points, that is, two points and the ground contact point, is set as the curvature radius of the bottom surface.

[0052] The exercise assisting tool may be configured to have a support stand that can be interposed between the bottom surface and a ground surface, which is configured to control a tilting motion of the exercise assisting tool. In this case, the user is capable of controlling unnecessary tilting motions of the exercise assisting tool by the use of the support stand that may be interposed between the bottom surface and the ground contact surface. This allows the exercise assisting tool to be readily stored when not in use. The user is further allowed to use the exercise assisting tool having the tilting motion controlled by the support stand as a chair.

[0053] The exercise assisting tool may be configured to have a pair of left and right support handles used by the user when using the exercise assisting tools according to any one of claims 1 to 10, which are provided separately from the exercise assisting tool, each of which has a gripper configured to be gripped by the user, a ground contact portion placed on the ground surface, and a non-slip portion formed on the ground contact portion, which are configured to suppress a slippage of the ground contact portion placed on the ground surface. The user is allowed to place the ground contact portion on the ground surface while gripping the gripper to control the tilting motion of the exercise assisting tool.

[0054] The support handles are configured to allow the user of the exercise assisting tool to place the ground contact portion on the ground surface while gripping the grippers. Accordingly, the user of the exercise assisting tool can balance among three points, legs and the pair of support handles. The support handles serve to suppress the positional slippage by means of the non-slip portions formed in the ground contact portions. The exercise assisting tool thus becomes easier to use.

EMBODIMENTS

First Embodiment

[0055] Hereinafter, an embodiment of an exercise assisting tool will be described in detail referring to FIGS. 1 to 11. As illustrated in FIG. 1, an exercise assisting tool 1 has a body portion 10 having a seating surface 2 on which a user is seated and a bottom surface 3 formed in a substantially spherical shape. The exercise assisting tool 1, as illustrated in FIG. 3, has a height H of the seating surface 2 at a lowermost point 20 in a range from 100 mm to 450 mm. The exercise assisting tool 1 further has lateral side portions 4 and a raised portion 21 as regulator means for suppressing any slippage of the user's buttocks from the seating surface 2.

[0056] Directions in the following description representing up, down, front, and back are respectively expressed as those of the exercise assisting tool 1 in the state where the user is seated on the seating surface 2 with the back straight up.

[0057] As illustrated in FIG. 5, an outline of the body portion 10 seen from the side of the seating surface 2 (from an upper side) has a substantially elliptical shape, and an inner part of the body portion constitutes the seating surface 2. As illustrated in FIGS. 3 and 6 to 8, the seating surface 2 has the raised portion 21 on a front side, more specifically, in a front-end center part thereof. The raised portion 21 has a gently curved surface and is higher than other portions. As illustrated in FIGS. 1 and 2, an outline of the body portion 10 when seen from the front side has a circular arc shape. The body portion 10 has the pair of lateral side portions 4 that stand upright from the seating surface 2 on lateral sides of the seating surface 2.

[0058] As illustrated in FIG. 3, the seating surface 2 has the lowermost point 20 in a rear direction relative to a center portion 22 of the seating surface 2, in other words, in a direction opposite the raised portion 21. The seating surface 2 is gently tilting from a peripheral edge thereof toward the lowermost point 20, thus forming a smooth continuous curved surface.

[0059] As illustrated in FIG. 3, the height H of the seating surface 2 is equal to a height of the lowermost point 20 of the seating surface 2 from the ground surface as a base point when the bottom surface 3 is in contact with the ground such

that the center portion 22 of the seating surface 2 is located vertically upward from a ground contact point 30. It is substantially equal to a height of the lowermost point of the user's buttocks from the ground surface when the user is seated on the seating surface 2 with the back straight up in a natural state. In this embodiment, the height H of the seating surface 2 is 185 mm.

[0060] As illustrated in FIGS. 2 and 3, the bottom surface 3 has a substantially spherical shape. In this embodiment, a curvature radius R of the bottom surface 3 measured in a front-back direction is 177 mm.

[0061] As illustrated in FIG. 5, the raised portion 21 is formed in the front-end center part of the seating surface 2, at which the user's groin is located. As illustrated in FIG. 3, the raised portion 21 is gradually raised from other portions toward the front end of the seating surface 2 on a straight line drawn to connect the lowermost point 20 of the seating surface 2 and the center portion 22 of the seating surface 2. As illustrated in FIGS. 6 to 8, the seating surface 2 including the raised portion 21 has a gentle continuous curved surface.

[0062] As illustrated in FIGS. 1 and 2, the paired lateral side portions 4 are formed in pair so as to stand upright with the seating surface 2 interposed therebetween at lateral sides, more specifically, at positions of the seating surface 2 corresponding to sides of the pelvic part of the user seated on the seating surface 2. When seen from the front side, the lateral side portions 4 in pair are more curved toward the seating surface 2 as they extend in an upper direction, as shown in FIG. 2. As illustrated in FIGS. 4 and 6 to 8, surfaces of the pair of lateral side portions 4 in contact with the user have gentle curved shapes so that each center portion is more depressed than peripheral portions in a direction opposite the seating surface 2. The pair of lateral side portions 4 can fit well with the shapes of the user's buttocks and waist. As illustrated in FIGS. 6 to 8, the seating surface 2 and the surfaces of the pair of lateral side portions 4 in contact with the user are formed with a gentle continuous curved surface.

[0063] As illustrated in FIG. 3, each of the paired lateral side portions 4 has such a radial shape that an outline thereof when laterally seen has a width gradually reduced upward from the seating surface 2. In the embodiment, a height I of the lateral side portion 4 is 178 mm. As illustrated in FIG. 3, the height I of the lateral side portion 4 is equal to the height from the lowermost point 20 of the seating surface 2 to an uppermost point 40 of the lateral side portions 4 measured when the bottom surface 3 is placed on the ground likewise the measurement of the height H of the seating surface 2.

[0064] A method of using the exercise assisting tool 1 will be described below. As illustrated in FIG. 9, the user is seated on the seating surface 2 of the exercise assisting tool 1 with the back straight up. Then, the user shakes or rotates the waist while keeping the upper body posture. Accordingly, the user can tilt the seating surface 2 while horizontally moving the seating surface 2 as illustrated in FIG. 11. As illustrated in FIG. 10, the exercise assisting tool 1 is used to rotate or twist muscles of the user's body around the waist.

[0065] Next, operational effects of the exercise assisting tool 1 will be described. The exercise assisting tool 1 has the height H of the lowermost point 20 of the seating surface 2, which is in the predefined range and the bottom surface 3 with a substantially spherical shape. Therefore, the user seated on the exercise assisting tool 1 is capable of tilting the seating surface 2 in all directions with the bottom surface 3 in contact with the ground by moving the waist while having the feet in

contact with the ground as a base point of the movement. Further, the exercise assisting tool 1 has the specific height H so as to ensure a large movable range of the tilting seating surface 2 appropriately. That is, this allows the user to broaden the movable range of the waist. Therefore, the user of the exercise assisting tool 1 increases a rotating radius of the rotational motion of the waist to exercise muscles of the waist by twisting effectively. When the height H of the seating surface 2 is set to be in the predefined range, the exercise assisting tool 1 allows the user to improve the exercising effect resulting from the rotational motion of the user's waist.

[0066] The exercise assisting tool 1 has the paired lateral side portions 4 standing upright with the seating surface 2 interposed therebetween, and the raised portion 21 formed in the front-end center part of the seating surface 2, both of which serve as the regulator means. The height I of the lateral side portion 4 measured from the lowermost point 20 of the seating surface 2 to the uppermost point 40 of the lateral side portion 4 is set to be in the predefined range. The seating surface 2, the raised portion 21, and surfaces of the paired lateral side portions 4 in contact with the user constitute the gentle continuous curved surface that follows the shapes of the user's buttocks, waist, and groin, thus supporting the user's buttocks, waist, and groin by taking advantage of the shape. Therefore, the user needs not hold the exercise assisting tool 1 with hands during the exercise. The exercise assisting tool 1 enables the user to smoothly perform the exercise, such as rotational motion of the waist, while being seated on such a position that allows the effective exercise and suppresses the slippage of the buttocks from the seating surface 2. Thus, the exercising effect on the waist of the exercise assisting tool 1 can be sufficiently improved by a synergy effect of the predefined range of the seating surface height H and the regulator means.

[0067] The height H of the seating surface 2 set to be in the predefined range may alleviate any physical burden on the user when seating thereon. As a result, the exercise assisting tool 1 becomes easy for the user to use.

[0068] The curvature radius R of the bottom surface 3 is set to be in the predefined range. Therefore, the exercise assisting tool 1 can regulate the tilting motion of the seating surface 2 in the movable range of the user's waist to be in the range that is sufficiently wide to improve the effect of the rotational motion, and assists the user in balancing.

[0069] The exercise assisting tool 1 is easy to use while ensuring the effective exercise.

Second Embodiment

[0070] This embodiment is an example where a plurality of materials are used to produce the body portion 10 of the exercise assisting tool 1 according to the first embodiment. As illustrated in FIG. 12, the exercise assisting tool 1 according to this embodiment has a core body 17 and an outer surface member 15 which covers the core body 17, both of which serve as the body portion 10. The core body 17 includes a bottom surface member 13 located at a side of the bottom surface 3, and a seating surface member 12 located at a side of the seating surface 2, which are formed of different materials.

[0071] The materials used to form the bottom surface member 13 and the seating surface member 12 are urethane foams respectively having different degrees of hardness. The material of the seating surface member 12 is a flexible urethane foam having plasticity so that the seating surface member 12 is deformable to a certain extent along the user's body shape

when seating thereon. The material of the bottom surface member 13 is a hard urethane foam having a larger degree of hardness than the seating surface member 12. Therefore, the bottom surface member 13 is unlikely to deform when the user is seated on the seating surface 2.

[0072] The paired lateral side portions 4 are formed integrally with the seating surface member 12 from the flexible urethane foam having the same properties. For this reason, the paired lateral side portions 4 have plasticity, and are adapted to laterally apply a pressing force to the user's pelvic part when the user is seated on the seating surface 2. The degree of hardness of the flexible urethane foam used in this embodiment as the material of the seating surface member 12 was 12 degrees when measured with a Shore durometer (model: LX-C, Wenzhou Sundoo Instruments Co., Ltd., China).

[0073] Fabric materials are used for forming the outer surface member 15. The fabric material having a high wear resistance is used for any portion that is liable to wear such as the bottom surface 3.

[0074] The exercise assisting tool 1 according to this embodiment has a center of gravity set at a position where the seating surface 2 is directed upward when it is left by itself. As illustrated in FIGS. 12 and 13, the bottom surface member 13 having a relatively high density is formed in a shape that allows the bottom surface member 13 to be almost rotation symmetric with respect to a center axis. For this reason, the center of gravity of the exercise assisting tool 1 is set as described above. The rest of the part is similar to those of the first embodiment.

[0075] Next, operational effects of this embodiment will be described. According to this embodiment, the center of gravity of the exercise assisting tool 1 is set at the position where the seating surface 2 is directed upward when it is left by itself. This allows the user to minimize the motion to adjust the direction of the exercise assisting tool 1 before its use. Further, the user is allowed to readily balance on the seating surface 2 directed upward. Then, resultant exercise assisting tool 1 becomes further easier to use.

[0076] The lateral side portions 4 have plastic properties, and are configured to laterally apply a pressing force to the pelvic part of the user seated on the seating surface 2. The lateral side portions 4 allow the exercise assisting tool 1 to support the pelvic part of the user. This may provide better fit between the user's pelvic part and the seating surface 2, thus helping the pelvic part in the follow-up of the movement of the seating surface 2. As a result, the exercise assisting tool 1 allows the user to exercise by twisting muscles of the waist.

[0077] The body portion 10 has the core body 17 and the outer surface member 15 which covers the core body 17. The core body 17 has the bottom surface member 13 located at the side of the bottom surface 3 and the seating surface member 12 located at the side of the seating surface 2, which are formed of different materials. The bottom surface member 13 has greater hardness degree than that of the seating surface member 12. Use of a relatively hard material for forming the bottom surface member 13 substantially eliminates the likelihood that the bottom surface 3 is sunk under the user's weight. Then, the exercise assisting tool 1 is liable to retain the shape of the bottom surface 3. Further, use of a relatively soft material for forming the seating surface member 12 alleviates physical burden on the user's waist and improves the fit between the user and the exercise assisting tool 1. The seating surface member 12 of the exercise assisting tool 1 may be used as the regulator means to suppress the slippage of the

user's buttocks. This embodiment provides the effects similar to those described in the first embodiment.

[0078] Though the first and second embodiments are configured to allow a plurality of portions to serve as the regulator means, for example, the pair of lateral side portions 4, at least one portion may be provided to function as the regulator means. For example, in place of the pair of lateral side portions 4 according to the first embodiment, the seating surface 2 and the raised portion 21 may be used as the regulator means to support the user's buttocks or groin by taking advantage of the shape. Meanwhile, it is possible to omit the raised portion 21 and provide the paired lateral side portions 4 alone as the regulator means. Besides the support by means of the configuration, other methods may be employed, for example, a fabric material with a large coefficient of friction may be used to form the outer surface member 15 so as to suppress the slippage between the seating surface 2 and the user's buttocks under the frictional force.

Third Embodiment

[0079] This embodiment is obtained by variously changing the height H of the seating surface 2, each height I of the pair of lateral side portions 4, the curvature radius R of the bottom surface 3, and the degree of hardness of the seating surface member 12 of the exercise assisting tool 1 according to the second embodiment.

[0080] <Height H of Seating Surface>

[0081] As shown in Table 1, test products 1 to 10 were prepared, in which the height H of the seating surface 2 of the exercise assisting tool 1 according to the second embodiment was variously changed. Table 1 shows results of exercising effects of those test products when they were used for the waist exercise. For the symbols, ⊙, ○, Δ and X in Table 1, of 10 persons, ⊙ denotes that 8 persons or more felt good exercising effect in the waist, ○ denotes that 5 persons or more felt likewise, Δ denotes that 3 persons or more felt likewise, and X represents that 2 persons or less felt satisfied. Those symbols ⊙, ○, and Δ were evaluated as acceptable.

TABLE 1

TEST PRODUCT No.	HEIGHT (H) OF SEATING SURFACE (mm)	LEVEL OF EXERCISING EFFECT
TEST PRODUCT 1	460	X
TEST PRODUCT 2	448	Δ
TEST PRODUCT 3	350	Δ
TEST PRODUCT 4	293	○
TEST PRODUCT 5	191	⊙
TEST PRODUCT 6	185	⊙
TEST PRODUCT 7	160	⊙
TEST PRODUCT 8	143	○
TEST PRODUCT 9	105	Δ
TEST PRODUCT 10	95	X

[0082] <Height I of Lateral Side Portion>

[0083] As indicated by Table 2, test products 11 to 19 were prepared by changing each height I of the lateral side portion 4 of the exercise assisting tool 1 according to the second embodiment. Table 2 shows ease of exercise upon use of the respective test products for the exercise of rotational motion of the waist. As for the symbols ⊙, ○, Δ, and X in Table 2, of 10 persons, ⊙ represents that 8 persons or more felt ease of the rotational motion of the waist, ○ represents that 5 persons or more felt ease, Δ represents that 3 persons or more felt ease, and X represents that 2 persons or less felt ease. The test products marked with ⊙, ○, and Δ were evaluated as acceptable.

and X represents that 2 persons or less felt ease. The test products marked with ⊙, ○, and Δ were evaluated as acceptable products.

TABLE 2

TEST PRODUCT No.	HEIGHT (I) OF LATERAL SIDE PORTION (mm)	EASE OF EXERCISE
TEST PRODUCT 11	255	Δ
TEST PRODUCT 12	250	○
TEST PRODUCT 13	195	○
TEST PRODUCT 14	178	⊙
TEST PRODUCT 15	153	⊙
TEST PRODUCT 16	141	⊙
TEST PRODUCT 17	137	○
TEST PRODUCT 18	120	○
TEST PRODUCT 19	85	Δ

[0084] <Curvature Radius R of Bottom Surface>

[0085] As indicated by Table 3, test products 21 to 30 were prepared by changing each curvature radius R of the bottom surface 3 according to the second embodiment. Table 3 shows a result of ease of exercise upon use of the respective test products for the exercise of rotational motion of the waist. As for the symbols ⊙, ○, Δ, and X in Table 3, of 10 persons, ⊙ represents that 8 persons or more felt ease of rotational motion of the waist, ○ represents that 5 persons or more felt ease, Δ represents that 3 persons or more felt ease, and X represents that 2 persons or less felt ease. The test products marked with ⊙, ○, and Δ were evaluated as acceptable.

TABLE 3

TEST PRODUCT No.	CURVATURE RADIUS (R) OF BOTTOM SURFACE (mm)	EASE OF EXERCISE
TEST PRODUCT 21	260	Δ
TEST PRODUCT 22	243	○
TEST PRODUCT 23	225	○
TEST PRODUCT 24	212	⊙
TEST PRODUCT 25	189	⊙
TEST PRODUCT 26	177	⊙
TEST PRODUCT 27	164	⊙
TEST PRODUCT 28	150	○
TEST PRODUCT 29	140	○
TEST PRODUCT 30	125	Δ

[0086] <Hardness of Seating Surface Member>

[0087] As indicated by Table 4, test products 31 to 38 were prepared by changing each hardness of the seating surface member 12 of the exercise assisting tool 1 according to the second embodiment. Table 4 shows a result of ease of the exercise of rotational motion of the waist. As for the symbols ⊙, ○, Δ, and X in Table 4, of 10 persons, ⊙ represents 8 persons or more felt ease of rotational motion of the waist, ○ represents that 5 persons or more felt ease, Δ represents that 3 persons or more felt ease, and X represents that 2 persons or less felt ease. The test products marked with ⊙, ○, and Δ were evaluated as acceptable.

TABLE 4

TEST PRODUCT No.	HARDNESS (DEGREE) OF BOTTOM SURFACE MEMBER	EASE OF EXERCISE
TEST PRODUCT 31	25	△
TEST PRODUCT 32	20	○
TEST PRODUCT 33	16	⊙
TEST PRODUCT 34	12	⊙
TEST PRODUCT 35	10	⊙
TEST PRODUCT 36	8	⊙
TEST PRODUCT 37	7	○
TEST PRODUCT 38	3	△

[0088] As is known from Table 1, by setting the height H of the seating surface 2 to be in the range at least from 105 mm to 448 mm, the exercise assisting tool 1 ensures effective exercise. Preferably, the height H of the seating surface 2 is set to be in the range from 143 mm to 293 mm, and more preferably, from 160 mm to 191 mm.

[0089] As is known from Table 2, by setting each height I of the pair of lateral side portions 4 to be in the range from 85 mm to 255 mm, the exercise assisting tool 1 easily ensures both to sufficiently support the user's pelvic part, and to allow the user to smoothly perform the exercise, resulting in ease of exercise. Setting each height I of the pair of the lateral side portions to be in the range from 120 mm to 250 mm allows the user to exercise more easily, and setting the height to be in the range from 141 mm to 178 mm allows the user to exercise further easily upon use of the exercise assisting tool 1.

[0090] As is known from Table 3, setting of the curvature radius R of the bottom surface 3 to be in the range from 125 mm to 260 mm allows the user to exercise more easily upon use of the exercise assisting tool 1. Setting of the curvature radius R of the bottom surface 3 to be in the range from 140 mm to 243 mm allows the user to exercise further easily, and setting of the curvature radius R to be in the range from 164 mm to 212 mm allows the user to exercise especially easily.

[0091] Though the hardness of the seating surface member 12 is not particularly limited, any physical burden on the user's waist was alleviated and the user's body was more fit with the seating surface member by setting the hardness measured by the Shore durometer (model: LX-C, Wenzhou Sundoo Instruments Co., Ltd., China) to be in the range from 3 degrees to 25 degrees, resulting in more ease of exercise. The exercise assisting tool 1 allows the user to exercise more easily by setting the hardness of the seating surface member 12 to be in the range from 7 degrees to 20 degrees, and allows the user to exercise especially easily by setting the hardness of the seating surface member 12 to be in the range from 8 degrees to 16 degrees.

Fourth Embodiment

[0092] An exercise assisting tool 1 according to this embodiment has a support stand 16 having a ring-like shape as illustrated in FIG. 14. As illustrated in FIG. 15, the support stand 16, when used, is interposed between the bottom surface 3 and the ground surface. Use of the support stand 16 thus interposed allows the user to control tilting motion of the exercise assisting tool 1.

[0093] Thus, the use of the interposed support stand 16 allows the user to control unintentional tilting motion of the exercise assisting tool 1. This may facilitate storage of the exercise assisting tool 1 in the unused state. The user may use

the exercise assisting tool 1 as a chair, which has the tilting motion controlled by the support stand 16.

Fifth Embodiment

[0094] An exercise assisting tool 1 according to this embodiment includes a pair of left and right support handles 18 illustrated in FIGS. 16 and 17. The support handles 18 are members provided separately from the exercise assisting tool 1. As illustrated in FIG. 16, each of the support handles 18 has a gripper 180 having a substantially circular shape that can be gripped by the user. Both ends of the grippers 180 are respectively provided with ground contact portions 181 formed in a columnar shape and placed on the ground surface as illustrated in FIG. 17.

[0095] The ground contact portions 181 respectively have, on both ends thereof, non-slip portions 182 made of a rubber that can prevent any positional slippage of the ground contact portions 181 placed on the ground surface.

[0096] The support handles 18 are used by the user of the exercise assisting tool 1 to control the tilting motion of the exercise assisting tool 1 by placing the ground contact portions 181 on the ground surface while gripping the grippers 180. Accordingly, the user of the exercise assisting tool 1 can balance with respect to three points, a leg portion and the pair of support handles 18. Slippage of the support handles 18 may be suppressed by the non-slip portions 182 formed in the ground contact portions 181. As a result, the exercise assisting tool 1 becomes easier to use.

[0097] The first to third embodiments represent the examples of the exercise assisting tool 1 having the curvature radius R of the bottom surface 3 substantially equal in the front-back and right-left directions. However, the curvature radius R of the bottom surface 3 may take different values in the front-back and right-left directions. As far as the curvature radius R in the front-back direction and the curvature radius R in the right-left direction are in the predefined range, the exercise assisting tool may control the tilting of the seating surface 2 to be in the range that is large sufficient to improve the exercising effect of rotational motion of the waist and helps the user in balancing as well.

1-11. (canceled)

12. An exercise assisting tool, comprising:

- a seating surface on which a user is seated; and
- a body portion having a bottom surface formed in a substantially spherical shape, wherein:
 - a height of the seating surface at a lowermost point is in a range from 100 mm to 450 mm; and
 - a regulator means is provided to suppress any slippage between buttocks of the seated user and the seating surface.

13. The exercise assisting tool according to claim 12, comprising a shape-change portion as the regulator means on the seating surface or a peripheral area thereof, which has its shape in accordance with a shape of at least a part of the buttocks, waist, or groin of the user seated on the seating surface.

14. The exercise assisting tool according to claim 12, wherein the body portion is provided with a pair of lateral side portions as the regulator means at positions corresponding to sides of a pelvic part of the user seated on the seating surface, which stand upright having the seating surface interposed therebetween.

15. The exercise assisting tool according to claim 14, wherein the lateral side portions have plastic properties, and

are configured to laterally apply a pressing force to the pelvic part of the user seated on the seating surface.

16. The exercise assisting tool according to claim 14, wherein a height of the lateral side portion measured from the lowermost point of the seating surface to an uppermost point of the lateral side portion is in a range from 100 mm to 250 mm.

17. The exercise assisting tool according to claim 12, wherein the seating surface has a raised portion raised from a periphery thereof, which serves as the regulator means in a center of the seating surface at a front-end side.

18. The exercise assisting tool according to claim 12, wherein:

- the body portion has a core body and an outer surface member which covers the core body;
- the core body includes a bottom surface member located at the bottom surface side, and a seating surface member located at the seating surface side, which are formed by using different materials, respectively; and
- the bottom surface member has a hardness greater than a hardness of the seating surface member.

19. The exercise assisting tool according to claim 12, wherein a center of gravity is set at a position where the seating surface is directed upward when the exercise assisting tool is left by itself.

20. The exercise assisting tool according to claim 12, wherein a curvature radius of the bottom surface is in a range from 130 mm to 250 mm.

21. The exercise assisting tool according to claim 12, comprising a support stand that can be interposed between the bottom surface and a ground surface, which is configured to control a tilting motion of the exercise assisting tool.

22. A pair of left and right support handles used by the user when using the exercise assisting tools according to claim 12, which are provided separately from the exercise assisting tool, each of the support handles having:

- a gripper configured to be gripped by the user;
- a ground contact portion placed on the ground surface; and
- a non-slip portion formed on the ground contact portion, which are configured to suppress a slippage of the ground contact portion placed on the ground surface, wherein the user is allowed to place the ground contact portion on the ground surface while gripping the gripper to control the tilting motion of the exercise assisting tool.

23. The exercise assisting tool according to claim 13, wherein the body portion is provided with a pair of lateral side portions as the regulator means at positions corresponding to

sides of a pelvic part of the user seated on the seating surface, which stand upright having the seating surface interposed therebetween.

24. The exercise assisting tool according to claim 13, wherein the seating surface has a raised portion raised from a periphery thereof, which serves as the regulator means in a center of the seating surface at a front-end side.

25. The exercise assisting tool according to claim 14, wherein the seating surface has a raised portion raised from a periphery thereof, which serves as the regulator means in a center of the seating surface at a front-end side.

26. The exercise assisting tool according to claim 15, wherein the seating surface has a raised portion raised from a periphery thereof, which serves as the regulator means in a center of the seating surface at a front-end side.

27. The exercise assisting tool according to claim 14, wherein:

- the body portion has a core body and an outer surface member which covers the core body;
- the core body includes a bottom surface member located at the bottom surface side, and a seating surface member located at the seating surface side, which are formed by using different materials, respectively; and
- the bottom surface member has a hardness greater than a hardness of the seating surface member.

28. The exercise assisting tool according to claim 14, wherein a center of gravity is set at a position where the seating surface is directed upward when the exercise assisting tool is left by itself.

29. The exercise assisting tool according to claim 14, wherein a curvature radius of the bottom surface is in a range from 130 mm to 250 mm.

30. The exercise assisting tool according to claim 14, comprising a support stand that can be interposed between the bottom surface and a ground surface, which is configured to control a tilting motion of the exercise assisting tool.

31. A pair of left and right support handles used by the user when using the exercise assisting tools according to claim 14, which are provided separately from the exercise assisting tool, each of the support handles having:

- a gripper configured to be gripped by the user;
- a ground contact portion placed on the ground surface; and
- a non-slip portion formed on the ground contact portion, which are configured to suppress a slippage of the ground contact portion placed on the ground surface, wherein the user is allowed to place the ground contact portion on the ground surface while gripping the gripper to control the tilting motion of the exercise assisting tool.

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