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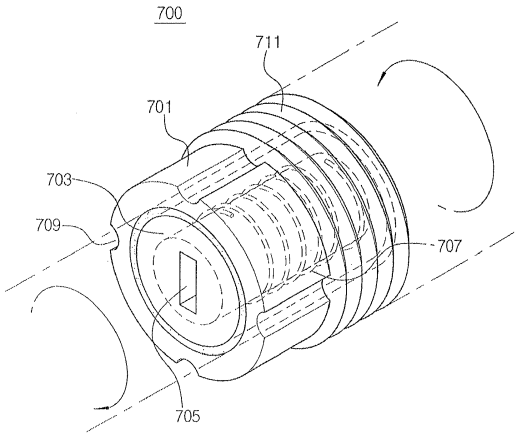
(54) MUSCULAR EXERCISE EQUIPMENT

(57) The present invention relates to a muscular exercise equipment. In particular, the muscular exercise equipment comprises: a first module comprising an upper support bar, and upper connecting rods connected at both ends of the upper support bar; a second module comprising a lower support bar, and lower connecting rods connected at both ends of the lower support bar; and a central support bar coupled to ends of the upper and lower connecting rods, wherein stepped portions are formed so that the ends of the upper connecting rods and the lower connecting rods are coupled so as to face each other, and the central support bar is disposed at an area in which the stepped portions are coupled, and a tension ring configured to provide an elastic force in an opposite direction to a rotating motion of at least one of the first and second modules using the central support bar as an axis is inserted in and disposed at the stepped portion of the upper connecting rods.

FIG26.



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Description

[Technical Field]

[0001] The present invention relates to muscular exercise equipment, and more particularly, to muscular exercise equipment which is capable of being used to develop various muscles, while having a simple structure and thus being easily manufactured.

[Background Art]

[0002] Exercises may be divided into an aerobic exercise, an anaerobic exercise and a mixed aerobic and anaerobic exercise. The aerobic exercise is an exercise in which most of energy supply required for performing the exercise is carried out by aerobic metabolism. On the contrary to the aerobic exercise, the anaerobic exercise is an exercise in which energy is produced without use of oxygen. The mixed aerobic and anaerobic exercise is an exercise in which the aerobic exercise and the anaerobic exercise are mixed.

[0003] The aerobic exercise such as walking, hypogastric breathing, aerobics, jogging, marathon, swimming, cycling and climbing is a low intensity exercise which is performed for a long time, and also a high rhythmic exercise which strengthens a cardiopulmonary function, keeps youth and delays aging and also which is suitable to treat obesity because fat is used as energy. The anaerobic exercise such as weight exercises, diving, throwing, weightlifting and short-distance (100m) running is a high intensity exercise which generates great power in a short time, and enhances muscular power and muscle endurance (agility and flexibility), and also in which a large amount of lactic acid (fatigue substances) are accumulated during an energy producing process because glycogen is used as an energy source. As described above, since each of the aerobic exercise, the anaerobic exercise and the mixed aerobic and anaerobic exercise has its own feature, it is difficult to say which exercise is good and which exercise is bad. Therefore, one of them, both of them or the mixed aerobic and anaerobic exercise may be performed according to a user's purpose of exercise.

[0004] Meanwhile, while an importance of the exercise is emphasized to modern people, various types of exercise equipment are provided. However, the various types of exercise equipment which have been provided until now serve to just develop or release specific muscle. Further, in the case of such exercise equipment, when the exercises using the equipment are not performed through correct postures, the exercise equipment may give an excessive impulse to a user's body, and thus may have a serious reverse effect on the user's spine or muscle.

[0005] Also, in the case of conventional exercise equipment, there is a problem that body muscles are partially developed, and thus a biased exercise is performed. Meanwhile, in the case of a treadmill which may allow a whole body exercise, since a separate motor has to be used, and thus power is needed, not only a purchasing cost of a product but also an additional cost in using the product, e.g., an electric charge may be involved.

[0006] Also, the conventional exercise equipment, such as the running machine and a bench press, is independently manufactured, and thus has to be separately purchased to be used. Therefore, the user has to pay a high cost for purchasing the exercise equipment, and also because the equipment has a large size and requires a predetermined base place, a large installation surface area is required, and there are many limitations in installing the exercise equipment.

[0007] And most of the conventional aerobic exercise equipment and anaerobic exercise equipment are manufactured to be suitable for only one exercise. Therefore, since the conventional exercise equipment is suitable for only exercises which train muscles or organs located at certain portions of a human body, new exercise equipment should be purchased to train various kinds of muscles and organs. As described above, since the conventional exercise equipment has the high purchasing cost and the separate installation place, and also has poor transportability.

[Disclosure]

[Technical Problem]

[0008] The present invention is directed to providing muscular exercise equipment which is capable of having no limitation in an installation thereof, and being adaptably deformed and applied to various portions of a human body.

[0009] Also, the present invention is directed to providing muscular exercise equipment which is capable of having a simple structure and thus being easily manufactured and also easily arranged and used.

[Technical Solution]

[0010] One aspect of the present invention provides muscular exercise equipment including an upper support bar having connecting rods disposed at both sides thereof and also having a predetermined length; a lower support bar having connecting rods disposed at both sides thereof and also having a predetermined length; and a central support bar to which the connecting rods of the upper support bar and the connecting rods of the lower support bar are coupled so that the upper support bar and the lower support bar has a predetermined contained angle, and which supports a bending motion of at least one of the upper support bar and the lower support bar.

[0011] The upper support bar may include a first upper connecting rod coupled to one end of the central support bar; and a second upper connecting rod coupled to the other end of the central support bar, and the lower support

bar may include a first lower connecting rod coupled to one end of the central support bar; and a second lower connecting rod coupled to the other end of the central support bar.

[0012] The central support bar may include an elastic member configured to support the support bars to be returned to their original positions according to a bending motion, when at least one of the upper support bar and the lower support bar performs the bending motion.

[0013] The central support bar may be provided to be rolled, and an embossing treatment may be performed on a surface of the central support bar.

[0014] At least one of the upper support bar and the lower support bar may be provided to be rolled.

[0015] The connecting rod may be provided to be curved from an end of the support bar to the central support bar.

[0016] The connecting rod may include an extending portion configured to extend vertically from an end of the support bar; and a curved portion curved from the extending portion to the central support bar.

[0017] The central support bar may be formed of a flat spring having a predetermined length.

[0018] The muscular exercise equipment may further include an assistant device including a handle portion, connecting portions which are vertically connected to both ends of the handle portion, extending portions configured to have a predetermined angle with respect to the connecting portions and to extend from ends of the connecting portions, and protruding portions configured to vertically protrude from ends of the extending portions and inserted and coupled into both sides of the central support bar.

[0019] The muscular exercise equipment may further include at least one of a first assistant unit having a first handle, a first support portion disposed perpendicularly to the first handle, a first upper joint configured to vertically connect the first handle with the first support portion and also to support the first handle to be bent by elasticity, a first lower joint connected with the first support portion and configured to support the first support portion to be returned to its original position by predetermined elasticity, and a first coupling portion connected with the first lower joint and coupled to one side of the central support bar; and a second assistant unit having a second handle, a second support portion disposed perpendicularly to the second handle, a second upper joint configured to vertically connect the second handle with the second support portion and also to support the second handle to be bent by elasticity, a second lower joint connected with the second support portion and configured to support the second support portion to be returned to its original position by predetermined elasticity, and a second coupling portion connected with the second lower joint and coupled to the other side of a second central support bar.

[0020] Another aspect of the present invention provides muscular exercise equipment including a first upper support bar having a first upper connecting rod disposed at one side thereof and also having a predetermined length; a first lower support bar having a first lower connecting rod disposed at one side thereof and also having a predetermined length; and a first central support bar in which the first upper connecting rod of the first upper support bar and the first lower connecting rod of the first lower support bar are coupled to one side thereof so that the first upper support bar and the first lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the first upper support bar and the first lower support bar.

[0021] The muscular exercise equipment may further include separate muscular exercise equipment including a second upper support bar having a second upper connecting rod disposed at the other side thereof and also having a predetermined length, a second lower support bar having a second lower connecting rod disposed at the other side thereof and also having a predetermined length, and a second central support bar in which the second upper connecting rod of the second upper support bar and the second lower connecting rod of the second lower support bar are coupled to the other side thereof so that the second upper support bar and the second lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the second upper support bar and the second lower support bar, wherein the separate muscular exercise equipment may be coupled so that the second upper connecting rod faces the first upper connecting rod, and the second lower connecting rod faces the first lower connecting rod.

[0022] The muscular exercise equipment may further include separate muscular exercise equipment including a second upper support bar having a second upper connecting rod disposed at the other side thereof and also having a predetermined length, a second lower support bar having a second lower connecting rod disposed at the other side thereof and also having a predetermined length, and a second central support bar in which the second upper connecting rod of the second upper support bar and the second lower connecting rod of the second lower support bar are coupled to the other side thereof so that the second upper support bar and the second lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the second upper support bar and the second lower support bar; and a coupling structure configured to connect at least one pair of the first and second upper support bars, the first and second lower support bars, and the first and second central support bars with each other.

[0023] Still another aspect of the present invention provides muscular exercise equipment including a first module including an upper support bar, and upper connecting rods connected at both ends of the upper support bar; a second module including a lower support bar, and lower connecting rods connected at both ends of the lower support bar; and a central support bar coupled to ends of the upper and lower connecting rods, wherein stepped por-

tions are formed so that the ends of the upper connecting rods and the lower connecting rods are coupled so as to face each other, and the central support bar is disposed at an area in which the stepped portions are coupled, and a tension ring configured to provide an elastic force in an opposite direction to a rotating motion of at least one of the first and second modules using the central support bar as an axis is inserted in and disposed at the stepped portion of the upper connecting rods.

[0024] A pin hole configured to pass through toward the central support bar, and a coupling pin inserted into and passing through the pin hole and coupled to a center of the tension ring disposed at the stepped portion of the upper connecting rods may be disposed at the stepped portion of the lower connecting rods.

[0025] A pin cover configured to cover an opening portion of the pin hole may be further disposed at the stepped portion of the lower connecting rods.

[0026] A bearing having a center through which the coupling pin passes and configured to support a rotation of the upper connecting rod, and an insertion hole configured to support an insertion of the tension ring may be disposed at the stepped portion of the upper connecting rods.

[0027] The tension ring may include at least one rail groove formed at an outer portion thereof; and a ring screw thread formed at the outer portion to be fastened to a coupling nut disposed at the central supporting bar, and a pin insertion hole in which the coupling pin is inserted and coupled.

[0028] The muscular exercise equipment may further include a rail protrusion formed at one side of an inner wall of the insertion hole formed at the upper connecting rod, and coupled to the rail groove.

[Advantageous Effects]

[0029] According to the muscular exercise equipment as described above, since the present invention can train various portions of the human body using one piece of equipment, it is possible to reduce the purchasing cost of the exercise equipment and also to develop various muscles.

[0030] Also, since the muscular exercise equipment of the present invention does not require a separate installation space, exercise can be performed without a space restriction.

[0031] Also, since the muscular exercise equipment of the present invention has a simple structure, a manufacturing cost thereof can be reduced, and also a mass production and sale thereof can be allowed.

[Description of Drawings]

[0032]

FIG. 1 is a view illustrating an exterior of muscular exercise equipment according to an embodiment of the present invention.

FIG. 2 is a view illustrating an operation method of the muscular exercise equipment according to the present invention.

FIGS. 3 to 6 are views illustrating an exercise method using the muscular exercise equipment according to the present invention.

FIG. 7 is a view illustrating an exterior of muscular exercise equipment according to another embodiment of the present invention.

FIGS. 8 to 11 are views illustrating an exercise method using the muscular exercise equipment according to another embodiment of the present invention.

FIG. 12 is a view illustrating a coupled state of the muscular exercise equipment according to another embodiment of the present invention.

FIGS. 13 and 14 are views illustrating other coupled states of the muscular exercise equipment according to another embodiment of the present invention.

FIGS. 15 to 19 are views illustrating other types of the muscular exercise equipment according to the embodiment of the present invention.

FIG. 20 is a view illustrating a first assistant device and the muscular exercise equipment according to the embodiment of the present invention.

FIG. 21 is a view illustrating an exercise method using the first assistant device and the muscular exercise equipment according to the embodiment of the present invention.

FIG. 22 is a view illustrating a second assistant device and the muscular exercise equipment according to the embodiment of the present invention, and an exercise method thereof.

FIGS. 23 to 25 are views illustrating a coupling structure of the muscular exercise equipment according to the embodiment of the present invention.

FIG. 26 is a view illustrating a structure in which a plurality of tension rings according to still another embodiment of the present invention are used for muscular exercise equipment.

FIG. 27 is a view illustrating the muscular exercise equipment having the plurality of tension rings according to still another embodiment of the present invention.

FIGS. 28 and 29 are views illustrating still other types of the muscular exercise equipment according to the embodiment of the present invention.

[Modes of the Invention]

[0033] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0034] In describing those embodiments, description will be omitted for techniques that are well known in the art to which the present invention pertains, and are not directly related to the present invention. Also, description of the constitution components having the substantially

same structures and functions will be omitted.

[0035] For the same reason, some constitution components are exaggerated, omitted or schematically shown in the attached drawings. Further, the size of respective components does not reflect entirely the actual size. The same drawing reference number is given to the same or corresponding components in drawings.

[0036] FIG. 1 is a view illustrating an exterior of muscular exercise equipment 10 according to an embodiment of the present invention, and FIG. 2 is a view illustrating an exercise direction of the muscular exercise equipment 10 according to the present invention.

[0037] Referring to FIGS. 1 and 2, the muscular exercise equipment 10 of the present invention includes a central support bar 200 providing an elastic force, a first module 100 which is coupled to both ends of the central support bar 200 to perform a lower support bar exercise, and a second module 300 which is coupled to the both ends of the central support bar 200 in the same manner as the first module 100 and arranged at a predetermined angel with respect to the first module 100.

[0038] In the muscular exercise equipment 10 of the present invention, the first module 100 and the second module 300 are arranged at a predetermined angle with respect to the central support bar 200, which is used as an axis, to perform a bending motion in an approaching or separating direction with respect to the central support bar 200, and an elastic force acts so that the first module 100 and the second module 300 are returned to their original positions. Therefore, in the muscular exercise equipment 10 of the present invention, the central support bar 200 is disposed at a joint portion of a human body, which may be supported, and the first module 100 or the second module 300 performs the bending motion in a predetermined direction using the central support bar 200 as the axis, and thus a momentum is generated to develop muscular strength.

[0039] In particular, in the muscular exercise equipment 10 of the present invention, the first module 100 and the second module 300 are arranged at the predetermined angle with respect to the central support bar 200 used as the axis, and provided to have a "⊏" shape. Therefore, an exerciser may insert and arrange a part of his/her body through an opened space formed at an inside of the first module 100 and the second module 300, and then may perform the bending motion in the predetermined direction using the central support bar 200 as the axis. The central support bar 200 may provide a first elastic force in a direction in which each contained angle formed by the first module 100 and the second module 300 is reduced, and may simultaneously provide a second elastic force in a direction in which each contained angle formed by the first module 100 and the second module 300 is increased. Therefore, the muscular exercise equipment 10 of the present invention supports so that the exerciser may perform various types of muscle strengthening exercises according to the exerciser's operation.

[0040] As illustrated in the drawings, the first module 100 includes an upper support bar 130, and first and second upper connecting rods 110 and 120 which are connected with both sides of the upper support bar 130.

[0041] The upper support bar 130 is formed of a cylindrical pipe having a predetermined length. It is preferable that the upper support bar 130 has a cylindrical shape to minimize a physical pressing applied to muscles or skins while the exerciser performs the exercises. However, the upper support bar 130 of the present invention is not limited to the cylindrical shape, and may be modified to have various shapes. For example, the upper support bar 130 may have an elliptical shape in a lengthwise direction, and thus upper, lower and middle portions thereof may have different diameters from each other. Also, the upper support bar 130 may be provided to have an internal central bar and an external cylinder which surrounds the internal central bar, such that the external cylinder is rotatable about the internal central bar. To this end, a bearing may be provided between the internal central bar and the external cylinder.

[0042] One side of the first upper connecting rod 110 is fastened to one of both side ends of the upper support bar 130, and the other side thereof is fastened to one end of the central support bar 200. The first upper connecting rod 110 serves to support the upper support bar 130 to be rotatable at the predetermined angle using the central support bar 200 as the axis. To this end, the first upper connecting rod 110 may have holes provided at upper and lower ends thereof to be coupled to one end of the upper support bar 130 and one end of the central support bar 200.

[0043] The second upper connecting rod 120 is coupled between one end of the upper support bar 130 and one end of the central support bar 200 at a position which faces the first upper connecting rod 110. The second upper connecting rod 120 may be formed to have the substantially same material and shape as those of the first upper connecting rod 110. When a physical force generated from the exerciser is transmitted to the upper support bar 130, the second upper connecting rod 120 may serve to provide the physical force to the central support bar 200 while supporting the upper support bar 130.

[0044] The upper support bar 130, the first upper connecting rod 110 and the second upper connecting rod 120 may be formed of a certain material, e.g., a metallic material or a nonmetallic material which may provide a certain rigidity, to maintain a predetermined rigidity and thus to support a strength exercise of the exerciser. That is, the first module 100 of the present invention may be formed of at least one of an iron, aluminum, copper or other alloy, lumber and plastic, and also other materials may be applied to each part. For example, the first upper connecting rod 110 and the second upper connecting rod 120 may be formed of a metallic material, and the upper support bar 130 may be formed of a rubber, carbon or

polymer material to prevent resistance when being in contact with a user's body or to provide a frictional force, or may be formed at an outer surface of a case.

[0045] As illustrated in the drawings, the second module 300 includes a lower support bar 330, and first and second lower connecting rods 310 and 320 which are connected with both sides of the lower support bar 330. Here, the lower support bar 330 is provided to have the same shape as that of the upper support bar 130 of the first module 100. Also, the first and second lower connecting rods 310 and 320 may be formed to have the substantially same material and shape as those of the first and second upper connecting rods 110 and 120. The second module 300 having such a structure is disposed at a predetermined angle with respect to the first module 100 while being coupled to the central support bar 200. And as described above, the second module 300 may be provided to be movable in one of up and down directions using the central support bar 200 as the axis.

[0046] Both ends of the central support bar 200 are coupled with the connecting rods of the first module 100 and the connecting rods of the second module 300. At this time, the central support bar 200 supports the first and second modules 100 and 300 to perform the bending motion in the predetermined direction. In addition, the central support bar 200 provides the elastic force in a direction opposite to the bending motion. As a result, the central support bar 200 may be formed to provide the elastic force and thus to maintain the contained angle formed at an early stage between the first and second modules 100 and 300. To this end, when the first and second modules 100 and 300 perform the bending motion, the central support bar 200 provides the elastic force in a direction in which the initial contained angle is formed between the first and second modules 100 and 300, e.g., a direction in which the current contained angle between the first and second modules 100 and 300 is reduced or a direction in which the current contained angle between the first and second modules 100 and 300 is increased.

[0047] Meanwhile, in the drawing, it has been illustrated that the central support bar 200 has a cylindrical shape, but the present invention is not limited thereto. That is, the central support bar 200 of the present invention may be formed to have at least one of a shape in which at least one spring is combined and a shape in which at least one flat spring is combined. Also, the central support bar 200 may be manufactured to have various shapes such as a flat roof shape on which the flat spring is wound. Also, the central support bar 200 may be formed to provide a tensile force which may reinstate the bending motions of the first and second modules 100 and 300. Further, the central support bar 200 of the present invention may be manufactured so that the above-described elastic members are exposed to an outside. However, since the exposed elastic members may damage the human body during a process in which the elastic force is provided, the central support bar 200 may further include a separate structure for covering the elastic members. For example, the central support bar 200 may include the above-described various structures, i.e., the elastic members which may provide the predetermined elastic force to return the first and second modules 100 and 300 at predesigned positions, and cylindrical members which have a predetermined shape to cover the elastic members. Therefore, the elastic members may be prevented from being directly in contact with the exerciser's body. For example, silicon, rubber, foam rubber, latex or the like may be used as the elastic member.

[0048] Meanwhile, in the previous description, it has been described that both of the first and second modules 100 and 300 perform the bending motion and thus the elastic force is applied. However, the present invention is not limited thereto. That is, the central support bar 200 may be formed to provide the elastic force to only one of the first and second modules 100 and 300. For example, the central support bar 200 may be fixed to the first module 100 not to perform the separate bending motion. Therefore, the central support bar 200 may be coupled with the first module 100 to have a "□" shape. And only the second module 300 which is additionally coupled with the central support bar 200 may be coupled to perform the bending motion at the predetermined angle using the central support bar 200 as the axis, and the central support bar 200 may be formed to provide the elastic force in a direction opposite to the bending motion.

[0049] Furthermore, in the case in which the central support bar 200 is provided to have a windup spring shape in which the flat spring is rolled, a magnitude of the elastic force may be controlled by an exerciser's operation. To this end, the central support bar 200 may further include a level controller 50 for controlling the magnitude of the elastic force. The user may control a level using the level controller 50, and thus may control the magnitude of the elastic force provided by the central support bar 200, thereby preforming the relatively more powerful strength exercise. The level controller 50 may be provided at a position which may deform shapes of the elastic members provided at the central support bar 200, e.g., at one of both side ends of the central support bar 200.

[0050] In another embodiment of the present invention, the muscular exercise equipment 10 may be formed so that the central support bar 200 does not separately provide the elastic force, but the first and second modules 100 and 300 directly provide the elastic force. More specifically, in the muscular exercise equipment 10 of the present invention, a first fixing part by which the first module 100 is fixed may be provided at one side of the central support bar 200, and also a second fixing part by which the second module 300 is fixed may be provided. At this time, each of the first and second modules 100 and 300 included in the muscular exercise equipment 10 may be provided to have the elastic force. Particularly, in the first and second upper connecting rods 110 and 120 of the first module 100, portions thereof coupled to the central support bar 200 may be configured with the elastic mem-

bers, such as the flat springs and the springs, which may be bent and thus may provide the elastic force. In the same manner, in the first and second lower connecting rods 310 and 320 of the second module 300, portions thereof coupled to the central support bar 200 may be configured with the flat springs and the springs. In this process, the central support bar 200 does not provide the separate elastic force, but serves just as a support bar which allows the first and second modules 100 and 300 to be maintained at the initially arranged positions. Therefore, when the user presses the first module 100 in an approaching or separating direction with respect to the second module 300, the elastic force is applied to the muscular exercise equipment 10 by the elastic members formed at the connecting rods so that the muscular exercise equipment 10 is returned to its original position.

[0051] As described until now, the muscular exercise equipment 10 according to the embodiment of the present invention is disposed to have the predetermined contained angle with respect to the central support bar 200 used as the axis, and may provide the elastic force against an exerciser's pressing motion, and thus may support the exerciser's strength exercise. For example, in FIG. 1, when the pressing motion is performed in a direction in which the first and second modules 100 and 300 come closer to each other, the muscular exercise equipment 10 of the present invention may be deformed so that the contained angle between the first and second modules 100 and 300 is reduced, as illustrated in FIG. 2. At this time, the muscular exercise equipment 10 of FIG. 2 may restore its shape by the elastic force of the elastic members provided at the central support bar 200 or the elastic members provided at the connecting rods of the first and second modules 100 and 300. In this process, as a predetermined physical force is provided to the exerciser's muscle, the muscular exercise equipment 10 of the present invention supports the exerciser's muscle to be strengthened or developed.

[0052] FIGS. 3 to 6 are views illustrating an exercise method using the muscular exercise equipment 10 according to the present invention. Referring to the drawings, the exerciser 1 using the muscular exercise equipment 10 of the present invention may arrange the muscular exercise equipment 10 at a certain portion of his/her body, and may perform the bending motion, thereby strengthening the muscles.

[0053] More specifically, referring to FIG. 3, the exerciser 1 may arrange the upper support bar 130 of the first module 100 at his/her chest so that the central support bar 200 is located at his/her waist and the lower support bar 330 of the second module 300 is located at his/her thigh, as illustrated in a state diagram 301. In this process, the exerciser 1 may pass through a quadrangular through-portion formed between the first module 100 and the central support bar 200, and also may pass through another quadrangular through-portion formed between the second module 300 and the central support bar 200. Here, a position of the muscular exercise equipment 10 may not be arranged like in the drawing according to an exerciser's height or body size. Therefore, in the muscular exercise equipment 10 of the present invention, the first and second modules 100 and 300 may be formed so that each length thereof is changed. For example, the first and second upper connecting rods 110 and 120 of the first module 100 and the first and second lower connecting rods 310 and 320 of the second module 300 may be formed to be adjusted in each lengthwise direction. In addition, each length of the upper support bar 130, the lower support bar 330 and the central support bar 200 may be adjusted. Here, the muscular exercise equipment 10 of the present invention may employ a bolt and a nut or may further include an additional subsidiary structure to adjust each length respectively.

[0054] Meanwhile, the muscular exercise equipment 10 may be arranged as illustrated in the state diagram 301, and then the exerciser 1 may perform the bending motion from a front side toward the ground. In this process, the exerciser 1 may strengthen back muscles, abdominal muscles, thigh muscles, femoral muscles and so on. In particular, the muscular exercise equipment 10 may support the exercise so that the momentum is concentrated at erector muscles and latissimus dorsi of the back muscles and the abdominal muscles. Here, when an upper body bending motion is performed while the exerciser's knees are bent at a predetermined angle to reduce a risk of a lumbar disc disease, the exercise 1 may perform the exercise for concentrically developing the abdominal muscles and the back muscles, while protecting the waist.

[0055] Referring to FIG. 4, as illustrated in state diagrams 401 and 403, the exerciser 1 may arrange the first module 100 of the muscular exercise equipment 10 at his/her back side, may arrange the central support bar 200 at an abdominal region, and also may arrange the second module 300 at a thigh region. In this case, in the muscular exercise equipment 10 of the present invention, while the exerciser 1 performs the bending motion from the front side toward the ground, the central support bar 200 directly presses the abdominal region, and thus upper muscles of the back muscles are used. Therefore, the muscular exercise equipment 10 of the present invention may provide effects in which an abdominal exercise is concentrically performed and the abdominal region is directly massaged, and thus may also provide an excellent effect in which fats collected at the abdominal region are dispersed. Here, to provide a more active effect, an embossing treatment may be performed on a surface the central support bar 200 of the muscular exercise equipment 10. And the central support bar 200 may be provided to be rolled and thus to minimize friction with the exerciser's skin while the exerciser 1 performs the bending motion. Therefore, in the muscular exercise equipment 10 of the present invention, when the exerciser 1 performs the bending motion, the surface of the central support bar 200 on which the embossing treatment is performed may apply the physical force to the

abdominal muscles while softly massaging the abdominal region, and thus may double an effect of the abdominal exercise effect.

[0056] Referring to FIG. 5, as illustrated in a state diagram 501, the exerciser 1 may arrange the first module 100 of the muscular exercise equipment 10 at an upper portion of his/her thigh, may arrange the central support bar 200 at a rear side of his/her knee joint, and also may arrange the second module 300 at a front side of his/her ankle. Then, the exerciser 1 may perform a motion which stretches the bent knee joint, as illustrated in a state diagram 503. At this time, the first and second modules 100 and 300 support so that the elastic force is generated in a direct downward direction with respect to the central support bar 200. Therefore, the exerciser 1 may develop his/her thigh muscles and calf muscles.

[0057] Referring to FIG. 6, as illustrated in a state diagram 601, the exerciser 1 may arrange the first module 100 of the muscular exercise equipment 10 at a rear side of his/her thigh, may arrange the central support bar 200 at a boundary region between the knee and the thigh, and also may arrange the second module 300 toward his/her Achilles tendon. And the exerciser 1 may perform a motion which bends the knee at a predetermined angle, as illustrated in a state diagram 603. Then, the muscular exercise equipment 10 provides the elastic force in a direction in which the knee is stretched. Therefore, the exerciser 1 may perform an exercise for developing the calf muscles and the thigh muscles.

[0058] Meanwhile, to perform the exercise as illustrated in FIGS. 5 and 6, it is preferable that the exerciser 1 seats on a chair or the like.

[0059] FIG. 7 is a view illustrating an exterior of muscular exercise equipment according to another embodiment of the present invention. Meanwhile, in the muscular exercise equipment according to another embodiment of the present invention, when a first exercise device 20 and a second exercise device 30 are coupled with each other, the same shape and exercise method as those of the muscular exercise equipment of FIG. 1 may be provided. Therefore, a combined structure of the first and second exercise devices 20 and 30 is designated by the same reference numerals as those in the previous muscular exercise equipment 10. Meanwhile, as will be described later, the first and second exercise devices 20 and 30 of the present invention are not provided to just separate the muscular exercise equipment of FIG. 1, but may be provided to independently perform the exerciser's exercise. Hereinafter, the muscular exercise equipment 10 according to another embodiment of the present invention, and an exercise method and other various shapes thereof will be described in detail with reference to the drawings.

[0060] Referring to FIG. 7, the muscular exercise equipment 10 of the present invention may include the first exercise device 20 and the second exercise device 30.

[0061] As described above, the muscular exercise equipment 10 of the present invention may be independently configured so that an exercise may be performed using only one of the first and second exercise devices 20 and 30, or using both of them.

[0062] First, as illustrated in the drawing, the first exercise device 20 includes a first central support bar 210, a first upper support bar 131, a first upper connecting rod 110, a first lower support bar 331 and a first lower connecting rod 310. Particularly, in the first exercise device 20 of the present invention, one side of the first upper connecting rod 110 may be bendably connected to one end of the first central support bar 210, and also one side of the first lower connecting rod 310 may be bendably connected to the same end of the first central support bar 210. Here, in the first exercise device 20 of the present invention, at least one of the first upper connecting rod 110 and the first lower connecting rod 310 may be bendably connected.

[0063] Meanwhile, one end of the first upper support bar 131 may be coupled to the other end of the first upper connecting rod 110 opposite to the one end thereof connected to the first central support bar 210. The first upper support bar 131 may be fixedly coupled with the first upper connecting rod 110 or may be coupled with the first upper connecting rod 110 to be rolled. The other end of the first upper support bar 131 may be rounded. In addition, a certain structure, e.g., a nut structure or a bolt structure may be provided at the other end of the first upper support bar 131. Meanwhile, not only the first upper support bar 131 but also the lower support bar 331, and a second upper support bar 132 and a second lower support bar 332 which are described later may be provided to be rolled. Also, even in a state in which the support bars are not separated, the support bars may be provided to be rolled.

[0064] The first upper connecting rod 110 and the first lower connecting rod 310 are simultaneously coupled to one end of the first central support bar 210, and the other end of the first central support bar 210 may be rounded. The other end of the first central support bar 210 may also include an additional structure for coupling the second exercise device 30 with a second central support bar 220. The first central support bar 210 is illustrated to have a cylindrical shape, but may be manufactured to have other shape. The first central support bar 210 may be provided to include the elastic member which provide the elastic force while the first upper connecting rod 110 and the first lower connecting rod 310 perform the bending motion, or the first central support bar 210 itself may be provided as the elastic member. Meanwhile, as described in FIG. 1, when the first upper connecting rod 110 and the first lower connecting rod 310 are formed to provide directly the elastic force against the applied physical force, the first central support bar 210 serves just as a support bar so that the first upper connecting rod 110 and the first lower connecting rod 310 have initially arranged structures. Here, the first central support bar 210 may be provided so that each of the first upper connecting

rod 110 and the first lower connecting rod 310 is inserted and fixed therein, or may have a structure in which the first upper connecting rod 110 and the first lower connecting rod 310 are directly connected with each other. In the case in which the first upper connecting rod 110 and the first lower connecting rod 310 are fixedly coupled to the first central support bar 210, the first central support bar 210 serves as the support bar while the first upper connecting rod 110 and the first lower connecting rod 310 provide the elastic force. In the case in which the first central support bar 210 supports the first upper connecting rod 110 and the first lower connecting rod 310 which are directly connected, the first central support bar 210 serves to fix each axis of the connecting rods and also to support coupling points of the connecting rods, while the connecting rods perform the bending motion. Such a structure of the first central support bar 210 may be equally applied to the muscular exercise equipment 10 of FIG. 1.

[0065] The second exercise device 30 may inclucle the second central support bar 220, a second upper support bar 132, a second upper connecting rod 120, a second lower support bar 332 and a second lower connecting rod 320. The second exercise device 30 may be provided to have the substantially same structure as that of the first exercise device 20, except directivity thereof. For example, when a rotating direction of the second exercise device 30 is controlled, the second exercise device 30 may be arranged to have the same shape as that of the first exercise device 20. The second exercise device 30 may independently perform a separate motion from the first exercise device 20, or may simultaneously perform the same motion along with the first exercise device 20. The second exercise device 30 may support the exerciser 1 to perform a both arms exercise, a both legs exercise or the like, while being not combined with the first exercise device 20. Also, as described in the previous first exercise device 20, the second exercise device 30 may be combined with the first exercise device 20, and may support the exercise methods illustrated in FIGS. 3 to 6. To this end, one end of the second exercise device 30 may include a coupling structure which is coupled with the first exercise device 20. For example, the bolt structure or the nut structure may be provided at a portion of one end of the second upper support bar 132, which is not coupled with the second upper connecting rod 120, to be coupled with the first upper support bar 131. In a similar manner, the bolt structure or the nut structure may be provided at a portion of one end of the second lower support bar 332, which is not coupled with the second lower connecting rod 320, to be coupled with the first lower support bar 331. Also, the coupling structure may be also provided at an end of the second central support bar 220 to be coupled with the first central support bar 210.

[0066] FIGS. 8 to 11 are views illustrating an exercise method using the first exercise device 20 or the second exercise device 30 according to the embodiment of the present invention. Hereinafter, for convenience of explanation, the exercise method using the second exercise device 30 will be described.

[0067] First, referring to FIG. 8, as illustrated in a state diagram 801, the exerciser 1 may arrange the second upper support bar 132 of the second exercise device 30 at his/her hip, may arrange the second central support bar 220 at the boundary portion between the thigh and the knee, and also may arrange the second lower support bar 332 at a rear side of his/her ankle in a state in which a prone position or a standing posture is held. And the exerciser 1 may apply the physical force so as to perform a motion which bends his/her knee, as illustrated in a state diagram 803. Then, the second exercise device 30 generates the elastic force in a direction in which the knees are stretched, and a certain physical force is applied to the exerciser's muscles, and thus the muscle strengthening exercise may be performed. In this process, the exerciser 1 may wear the first exercise device 20, instead of the second exercise device 30. However, to minimize a contact between the exercise device and an opposite leg which does not perform the exercise, the exercise device may be selected or a direction of the exercise device may be controlled so that portions in which the support bar and the central bar are connected with each other are directed to an outside of the exerciser's body. Meanwhile, the exerciser 1 may perform exercises for strengthening femoral muscles, calf muscles and ligaments of one of both legs through the above-described exercise.

[0068] Then, referring to FIG. 9, as illustrated in a state diagram 901, the exerciser 1 may arrange the second upper support bar 132 of the second exercise device 30 at an upper portion of his/her thigh, may arrange the second central support bar 220 at a rear side of his/her bent knee, and also may arrange the second lower support bar 332 at a front side of his/her ankle. Then, the exerciser 1 may perform a motion which stretches the knee in a state in which the leg wearing the second exercise device 30 is bent, as illustrated in a state diagram 903, and thus may strengthen the muscular strength of the leg. In this process, the exerciser 1 may grasp an armrest of a chair, or the like with his/her both arms, and thus may keep his/her balance. The exerciser 1 may strengthen the muscular power of only a certain leg which is required to be strengthened using the second exercise device 30 or the first exercise device 20.

[0069] Referring to FIG. 10, as illustrated in a state diagram 1001, the exerciser 1 may arrange the second upper support bar 132 of the second exercise device 30 at his/her bicephalous brachii, may arrange the second central support bar 220 at a region adjacent to an arm joint connecting upper limbs with lower limbs, and also may arrange the second lower support bar 332 at one end of his/her wrist in a state in which his/her arm is stretched. Then, the exerciser 1 may change his/her arm into a bent state, and thus may apply the physical force to the second exercise device 30, as illustrated in a state diagram 1003. In this process, the second exercise de-

vice 30 may provide the elastic force in a direction opposite to a motion direction performed by the exerciser 1, and thus may strengthen the muscle power of the arm. Therefore, the second exercise device 30 may support the exerciser 1 to strengthen the muscle power related to the arm joint such as the bicephalous brachii.

[0070] Referring to FIG. 11, as illustrated in a state diagram 1101, the exerciser 1 may arrange the second upper support bar 132 of the second exercise device 30 at triceps muscle of his/her arm, may arrange the second central support bar 220 at an inside of the bent arm joint, and also may arrange the second lower support bar 332 at his/her wrist or may grasp the second lower support bar 332 with his/her hand. And the exerciser 1 may generate muscle power to stretch the bent arm joint, as illustrated in a state diagram 1103. Therefore, the exerciser's arm is maintained in a stretched state. At this time, the second exercise device 30 provides the elastic force to bend the stretched arm again. Thus, for example, the exerciser 1 may perform a motion which maintains the stretched state of the arm and thus may develop muscle endurance using the second exercise device 30.

[0071] Meanwhile, as illustrated in FIG. 1 or the like, the muscular exercise equipment 10 of the present invention may include a level controller which may control the elastic force or the tensile force, and thus may control an exercise intensity. Such a function may be provided at each of the first and second exercise devices 20 and 30. As a result, the first and second exercise devices 20 and 30 of the present invention enable the exerciser to differently control the exercise intensity of each of the first and second exercise devices 20 and 30. Such graded distribution of the exercise intensity may provide an optimal exercise environment to the exerciser whose muscles are differently developed, or whose muscle power is damaged, or who is subject to restriction in a scope of the exercise, or who has partial muscle power in which rehabilitation is required.

[0072] In the above description, the exercise method using only the second exercise device 30 has been described, but the present invention is not limited thereto. That is, both of the first and second exercise devices 20 and 30 may be used at the same time according to an exerciser's intention. For example, the exerciser 1 may perform a left arm exercise among the above-described arm exercises using the first exercise device 20, and also may perform a right arm exercise using the second exercise device 30. In the same manner, the exerciser 1 may perform a left leg exercise among the above-described leg exercises using the first exercise device 20, and also may perform a right leg exercise using the second exercise device 30. Also, the exerciser 1 may perform the exercise of one of the both arms using the first exercise device 20, and also may perform the exercise of one of the both legs using the second exercise device 30.

[0073] FIGS. 12 to 14 are views illustrating various coupling states of the first and second exercise devices 20 and 30 according to the embodiment of the present invention.

[0074] First, referring to FIG. 12, in the muscular exercise equipment 10 of the present invention, the first and second exercise devices 20 and 30 may be coupled with each other so that only the first and second central support bars 210 and 220 are coupled with each other using a first coupling structure 401. In the muscular exercise equipment 10 of the present invention which has such a structure, the first and second upper support bars 131 and 132 are disposed to be spaced apart from each other by a length of the first coupling structure 401. Similarly, in the muscular exercise equipment 10 of the present invention, the first and second lower support bars 331 and 332 are also disposed to be spaced apart from each other by the length of the first coupling structure 401.

[0075] The first coupling structure 401 may be formed to have a larger diameter than a diameter of the first central support bar 210 and a diameter of the second central support bar 220. A nut shape may be provided at an inside of the first coupling structure 401. Correspondingly, a bolt shape may be provided at each end of the first and second central support bars 210 and 220. The ends of the first and second central support bars 210 and 220 may be coupled with the nut shape formed at the inside of the first coupling structure 401, and thus may have an arrangement structure as illustrated in FIG. 12.

[0076] The muscular exercise equipment 10 having the above-described structure may allow the exerciser to easily wear the exercise devices by providing an opening portion between the first and second upper support bars 131 and 132 and an opening portion between the first and second lower support bars 331 and 332. Also, the muscular exercise equipment 10 having the above-described opening portions may allow the exerciser to easily take off the exercise devices through the opening portions after the exerciser finishes the exercise. The muscular exercise equipment 10 of the present invention having the first coupling structure may allow the first and second upper support bars 131 and 132 and the first and second lower support bars 331 and 332 not to have separate coupling structures.

[0077] Referring to FIG. 13, the first and second exercise devices 20 and 30 of the present invention may be combined with each other so that positions in which the connecting rods are provided face each other. To this end, the muscular exercise equipment 10 of the present invention may further include a coupling structure, such as a bolt/nut structure and a hook structure, which is provided at at least one of the connecting rods, the support bars and the central bars to be combined with each other. Here, the muscular exercise equipment 10 may further include a clip other than the above-described structure. The clip may be formed to be a slightly smaller than each thickness of the first and second upper connecting rods 110 and 120 or the first and second lower connecting rods 310 and 320, and thus may be inserted in a widthwise direction of each of the connecting rods to fix the

connecting rods, while the connecting rods are arranged to face each other.

[0078] Referring to FIG. 14, the first and second exercise devices 20 and 30 of the present invention may be arranged such that the connecting rods face each other, and may be also fixed so as to be spaced apart from each other by a length of a second coupling structure 402. To this end, the second coupling structure 402 may be formed to have a predetermined shape which may be coupled with one side of the first central support bar 210 and one side of the second central support bar 220, i.e., may be formed so that, for example, a plurality of spring balls are arranged on a cylindrical surface thereof. In addition, a hole or groove in which the second coupling structure 402 can be inserted is provided at a center of the first central support bar 210 and a center of the second central support bar 220, and a plurality of ball grooves in which the spring balls are inserted and fixed may be provided at an inner surface of the hole or the groove. Here, the spring balls mean balls which are pressed by a direct downward pressing action or a lateral pressing action and then protrude again when the pressing action is released. The spring balls are inserted into the ball groove provided in the hole or the groove and then maintain a coupled state before a predetermined or more physical force is generated.

[0079] Here, the second coupling structure 402 may serve to fixedly couple the first central support bar 210 with the second central support bar 220, and may be arranged so that the first upper connecting rod 110, the second upper connecting rod 120, the first lower connecting rod 310 and the second lower connecting rod 320 perform the bending motion. Therefore, the muscular exercise equipment 10 of the present invention may allow the connecting rods to be operated at different times, and thus may allow the exerciser to perform various exercise methods. For example, the exerciser may perform one arm exercise using the first upper connecting rod 110 and the first upper support bar 131 and another arm exercise using the second upper connecting rod 120 and the second upper support bar 132 at different times. Also, the exerciser may perform one leg exercise using the first lower connecting rod 310 and the first lower support bar 331 and another leg exercise using the second lower connecting rod 320 and the second lower support bar 332 at different times.

[0080] Meanwhile, the above description has described an example in which the second coupling structure 402 is provided to couple the first central support bar 210 with the second central support bar 220, but the present invention is not limited thereto. That is, the second coupling structure 402 may be provided between the first upper support bar 131 and the second upper support bar 132 to fixedly couple the first upper support bar 131 with the second upper support bar 132. Also, the second coupling structure 402 may be provided between the first lower support bar 331 and the second lower support bar 332 to fixedly couple the first lower support bar 331 with the second lower support bar 332. The muscular exercise equipment 10 having such a structure may allow the exercises using the first and second exercise devices 20 and 30 to be performed at different times. That is, the exerciser 1 may alternately perform the exercise using the first exerciser device 20 and the exercise using the second exercise device 30 and thus may perform various exercise methods.

[0081] FIGS. 15 to 19 are views illustrating other types of the muscular exercise equipment 10 according to the embodiment of the present invention.

[0082] As illustrated in FIG. 15, the other types of the muscular exercise equipment 10 of the present invention may include a first module 100 having an upper support bar 130, and first and second curved upper connecting rods 111 and 121 which are connected with both ends of the upper support bar 130 and curved toward a central support bar 200 having a predetermined size; and a second module 300 which has the same shape as the first module 100 and also has first and second curved lower connecting rods 311 and 321 provided at the central support bar 200. As illustrated in the drawings, each of the curved connecting rods may include an extending portion which is disposed perpendicularly to the support bar, and a curved portion which is provided to be curved from an end of the extending portion to one side of the central support bar 200. Meanwhile, in the muscular exercise equipment 10 of FIG. 15, the upper support bar may include a first upper support bar 131 and a second upper support bar 132 which are spaced a predetermined distance, and the lower support bar may include a first lower support bar 331 and a second lower support bar 332 which are spaced a predetermined distance, as illustrated in FIG. 16.

[0083] Also, as illustrated in FIG. 17, the muscular exercise equipment 10 of the present invention may include a first module 100, a second module 300 and a central support bar 200. In particular, the first module 100 may include an upper support bar 130, a first upper curved portion 112 and a second upper curved portion 122. Also, the second module 300 may include a lower support bar 330, a first lower curved portion 312 and a second lower curved portion 322. Here, the first and second upper curved portions 112 and 122 may serve to connect the upper support bar 130 with the central support bar 200, and may be bent in a direction which becomes distant from the second module 300. Therefore, the curved portions of the present invention may be disposed to have a "U" shape as illustrated in the drawing.

[0084] Meanwhile, as illustrated in FIG. 18, the muscular exercise equipment 10 of the present invention may be formed to have different curved portions. That is, the first module 100 includes a first curved portion 113 and a second curved portion 123 which connect the upper support bar 130 with the central support bar 200, and the second module 300 includes a third curved portion 313 and a fourth curved portion 323 which connect the lower support bar 330 with the central support bar 200. Here,

each of the first and second curved portions 113 and 123 may be bent in a direction in which the lower support bar 330 is disposed. Therefore, the curved portions of the muscular exercise equipment 10 of the present invention may be disposed to have a "v" shape as illustrated in the drawing.

[0085] Meanwhile, as illustrated in FIG. 19, in the muscular exercise equipment 10 according to the embodiment of the present invention, the central support bar may be configured with a plate type central support bar 201 which is formed to have a plate shape having a predetermined length. A first module 101 of the muscular exercise equipment 10 may be connected to both end edges of one end of the plate type central support bar 201, and a second module 301 may be connected to both end edges of the other end of the plate type central support bar 201. In the muscular exercise equipment 10 having such a structure, the first and second modules 101 and 301 are operated from a center of the plate type central support bar 201 toward an outside thereof, and thus may allow the exerciser to perform a predetermined exercise.

[0086] FIG. 20 is a view illustrating a first assistant device which may be coupled with the muscular exercise equipment 10 according to the embodiment of the present invention.

[0087] Referring to FIG. 20, a first assistant device 500 may include a handle portion 530, a first handle support portion 510 and a second handle support portion 520. The first handle support portion 510 and the second handle support portion 520 may include first connecting portion 511 and second connecting portion 521 which are connected to both ends of the handle portion 530 perpendicularly to the handle portion 530, a first extending portion 512 which is disposed at a predetermined angle with respect to the first connecting portion 511 to extend from an end of the first connecting portion 511, a second extending portion 522 which is disposed at a predetermined angle with respect to the second connecting portion 521 to extend from an end of the second connecting portion 521, a first protruding portion 513 which protrudes from an end of the first extending portion 512 perpendicularly to the first extending portion 512, and a second protruding portion 523 which protrudes from an end of the second extending portion 522 perpendicularly to the second extending portion 522. Here, the first protruding portion 513 may be inserted and fastened into one end of the central support bar 200, and the second protruding portion 523 may be inserted and fastened into the other end of the central support bar 200. In particular, the first and second protruding portions 513 and 523 may be coupled to the central support bar 200 so that the first assistant device 500 may perform the bending motion in a predetermined direction. A center groove having a predetermined pattern, by which the first assistant device 500 is disposed at a predetermined angle with respect to the first module 100 or the second module 300, when the first assistant device 500 is inserted, may be provided at a center of the central support bar 200. Therefore, ends of the first and second protruding portions 513 and 523 may be formed to correspond to the pattern of the center groove of the central support bar 200.

[0088] FIG. 21 is a view illustrating an exercise method using the first assistant device 500 and the muscular exercise equipment 10 according to the embodiment of the present invention.

[0089] Referring to FIG. 21, the exerciser 1 may arrange the first module 100 at his/her chest side, may arrange the central support bar 200 at his/her waist region, and also may arrange the second module 300 at the upper portion of his/her thigh or a front portion of his/her calf. In this case, the first assistant device 500 may be grasped by the exerciser 1 and may perform the bending motion in a predetermined direction, e.g., from a front surface toward a rear surface or from the rear surface toward the front surface. The exerciser 1 may wear and support the muscular exercise equipment 10, and then may perform the arm exercise using the first assistant device 500.

[0090] FIG. 22 is a view illustrating another type of the assistant device which may be coupled with the muscular exercise equipment 10 according to the present invention.

[0091] Referring to FIG. 22, a second assistant device 600 of the present invention may include a first assistant unit 610 which is coupled to one end of the central support bar 200 and a second assistant unit 620 which is coupled to the other end of the central support bar 200.

[0092] The first assistant unit 610 includes a first handle 611, a first support portion 613, a first upper joint 612, a first lower joint 614 and a first coupling portion 615. The first handle 611 is formed of a material having a predetermined rigidity, and may be formed to have a length and a shape which may be grasped by the exerciser. The first upper joint 612 serves to connect the first handle 611 with the first support portion 613, and supports the first handle 611 to be bent in a predetermined direction. At this time, the first upper joint 612 is formed of a material, such as a spring device, which may provide the elastic force, and thus may allow the first handle 611 to be bent in a predetermined direction and then to be returned to an original position.

[0093] The first lower joint 614 is disposed between the first support portion 613 and the first coupling portion 615, and allows the first support portion 613 to be bent in a predetermined direction using the first coupling portion 615 as an axis. The first lower joint 614 is also formed of the material which may provide an elastic force, and thus may provide the elastic force to the first support portion 613 so that the first support portion 613 is restored to its original shape, when the first support portion 613 is bent in the predetermined direction.

[0094] The second assistant unit 620 includes a second handle, 621, a second support portion 623, a second upper joint 622, a second lower joint 624 and a second coupling portion 625. The second assistant unit 620 hav-

ing such a structure may be formed to have the substantially same shape as that of the first assistant unit 610. However, the second assistant unit 620 is coupled to the central support bar 200 to face the first assistant unit 610.

[0095] As illustrated in the drawing, the second assistant device 600 of the present invention allows the exerciser to perform a motion which pulls the first and second handles 611 and 621, while grasping the first and second handles 611 and 621. At this time, the exerciser may arrange the first module 100 of the muscular exercise equipment 10 at his/her leg side, may arrange the central support bar 200 at the abdominal region, and also may arrange the second module 300 at his/her waist. The exerciser may start an exercise in a sitting posture, and may perform a motion which pulls the second assistant device 600 toward an inside of his/her body, and thus may perform a rowing exercise. In this process, the second assistant device 600 supports the rowing exercise using the elastic force of the joints so that the rowing exerciser substantially uses predetermined muscle power.

[0096] As described above, since the muscular exercise equipment 10 according to the embodiment of the present invention may provide various exercise methods while having a simple structure, it is possible to support the exercises for strengthening various muscles of the exerciser's body. Also, by a separating and coupling operation, the muscular exercise equipment 10 of the present invention may diversify the exercise method or may perform the muscle exercise which strengthens only a desirable region.

[0097] FIG. 23 is a view schematically illustrating a structure of the muscular exercise equipment 10 according to the embodiment of the present invention, and FIG. 24 a view illustrating a connection relationship among the first module 100, the second module 300 and the central support bar 200. And FIG. 25 is a cross-sectional view taken along line A-A of FIG. 24. Hereinafter, for convenience of explanation, a connecting relationship between the first upper connecting rod 110 of the first module 100 and the first lower connecting rod 310 of the second module 300 will be provided and described as a representative example.

[0098] Referring to FIGS. 23 to 25, the muscular exercise equipment 10 of the present invention is formed to be stepped, such that the first upper connecting rod 110 and the first lower connecting rod 310 are engaged with each other, and a tension ring 70(700) is disposed at one side of the first upper connecting rod 110 to be coupled with the central support bar 200.

[0099] In particular, a pin hole 340 which passes through a stepped portion may be provided at a stepped area of the first lower connecting rod 310. A coupling pin 230 is inserted into the pin hole 340 provided at the first lower connecting rod 310, and also a pin cover 240 which prevents the coupling pin 230 inserted into the pin hole 340 from being separated may be further provided. As illustrated in the drawing, the coupling pin 230 passes through the pin hole 340 formed at the first lower connecting rod 310, passes through a bearing 114 disposed at one side of the first upper connecting rod 110, and then is coupled into a through-portion formed at a tension ring 700. At this time, as illustrated in the drawing, the coupling pin 230 may be formed in an angular shape to rotate the tension ring 700 while the first lower connecting rod 310 is rotated in a predetermined direction, such that the elastic force is applied.

[0100] The bearing 114 having a through-hole which is connected with the pin hole 340 is disposed at the stepped area of the first upper connecting rod 110 facing an area in which the pin hole 340 of the first lower connecting rod 310 is disposed. Here, a thickness of the bearing 114 is formed smaller than a thickness of the stepped portion of the first upper connecting rod 110. As will be described below, an insertion hole in which the tension ring 700 is inserted may be provided at the bearing 114 and the extending stepped area. A rail protrusion is provided at the insertion hole in a direction which passes through the stepped portion of the first upper connecting rod 110, and a rail groove formed at the tension ring 700 is inserted onto the rail protrusion to fix an outer portion of the tension ring 700.

[0101] As illustrated in the drawing, the central support bar 200 may be formed in a bar shape, and a screw thread may be provided at an end thereof. A coupling nut 403 is provided at the end of the central support bar 200. The coupling nut 403 may be disposed to connect the end of the central support bar 200 with an end of the tension ring 700.

[0102] Meanwhile, the above description has described an example in which the bearing 114 and the tension ring 700 are separately provided, but the present invention is not limited thereto. That is, the through-portion through which the bearing 114 and the tension ring 700 are inserted may be provided at the muscular exercise equipment 10 of the present invention, and the bearing 114 and the tension ring 700 may be integrally provided, and then may be inserted and fixed into the corresponding through-portion.

[0103] In the muscular exercise equipment 10 of the present invention having the above-described structure, the tension ring 700 rotates while the first lower connecting rod 310 is twisted with the first upper connecting rod 110, and applies the elastic force to the first lower connecting rod 310. Also, the first upper connecting rod 110 is rotated by the bearing 114, while being twisted with the first lower connecting rod 310, and supports the elastic force of the tension ring 700 to be compressed. Therefore, in the muscular exercise equipment 10 of the present invention, when the first upper connecting rod 110 and the first lower connecting rod 310 are pressed to be rotated in a predetermined direction using the central support bar 200 as an axis, an elastic restoring force of the tension ring 700 is generated, and the restoring force increases the momentum of the muscle and supports the muscle power to be strengthened.

[0104] FIG. 26 is a view illustrating a detailed structure of the tension ring according to the embodiment of the present invention.

[0105] Referring to FIG. 26, the tension ring 700 of the present invention includes an outer portion 701 which is seated and fixed in a through-portion provided at the first upper connecting rod 110, and a central portion 703 which is provided at an inside of the outer portion 701 to be rotated in a predetermined direction according to a rotating motion of the coupling pin 230 inserted and fixed therein. At least one rail groove 709 is provided at the outer portion 701, and the rail groove 709 is coupled with the rail protrusions provided at the through-portion, when the tension ring 700 is inserted into the through-portion of the first upper connecting rod 110. The rail groove 709 is partly provided at an upper end of the outer portion 701, and a ring screw thread 711 is provided at a lower end of the outer portion 701 to be fastened to the coupling nut 403 of the central support bar 200.

[0106] Meanwhile, an elastic structure 707 is disposed at an inside of the tension ring 700 to allow a tension to be applied in an opposite direction to a rotating direction of the central portion 703, while the central portion 703 is rotated. Meanwhile, a pin insertion hole 705 in which the coupling pin 230 is inserted and fixed is provided at a center of the central portion 703. A bearing may be provided between the outer portion 701 and the central portion 703 so that the central portion 703 may be rotated. At this time, one end of the elastic structure 707 is connected with the central portion 703, and the other end thereof is connected with the outer portion 701 to provide the restoring force generated according to rotating motions of the central portion 703 and the outer portion 701 opposite to each other. For example, a spiral, compression, extension, torsion or rubber spring may be used as the elastic structure 707.

[0107] FIG. 27 is a view partly illustrating a structure for describing the muscular exercise equipment in which the elastic force may be controlled according to still another embodiment of the present invention.

[0108] Referring to FIG. 27, the muscular exercise equipment of the present invention may employ a structure in which a plurality of tension rings 700 may be inserted. To this end, a ring insertion pipe 115 which is formed by extending the through-portion sequentially formed with the bearing 114 to insert the tension ring 700 therein may be provided at the stepped area of the first upper connecting rod 110. A pipe screw thread 116 which is fastened with the coupling nut 403 is provided at an end of the ring insertion pipe 115, and rail protrusions 117 which are fastened with the rail groove 709 provided at the tension ring 700 may be provided at an inside of the ring insertion pipe 115.

[0109] A pin hole in which the coupling pin 230 is inserted is provided at the stepped area of the first lower connecting rod 310, and the coupling pin 230 is inserted into the pin hole, and disposed to cross a center of the ring insertion pipe 115. The pin cover 240 serves to support the coupling pin 230 and thus to prevent the coupling pin 230 from being separated from the first lower connecting rod 310.

[0110] Meanwhile, as described in the drawing, a plurality of tension rings 700 may be inserted into the ring insertion pipe 115 according to a user's intention. After the tension rings 700 are inserted, the coupling nut 403 and the central support bar 200 may be connected to an end of the ring insertion pipe 115. Here, each of the tension rings 700 may provide the predetermined elastic force. As a result, as the number of the tension rings 700 is increased, the generated elastic force is increased, and thus the momentum is also increased. The user may control the number of the tension rings 700 to control the exercise intensity.

[0111] The embodiment has been described an example in which the exercise intensity is controlled by controlling the number of the tension rings 700, but is not limited thereto. For example, the exercise intensity may be controlled by controlling an elastic coefficient of the elastic structure provided at the tension ring 700. That is, the exercise intensity may be controlled by replacing the tension ring 700 with other tension rings having different elastic coefficients.

[0112] FIG. 28 is a view illustrating another shape of a connecting portion among the first upper connecting rod 110, the second module 300 and the central support bar 200 in the muscular exercise equipment 10 according to the embodiment of the present invention, and FIG. 29 is a view illustrating detailed structures of the first upper connecting rod 110 and the tension ring 700.

[0113] Referring to FIGS. 28 and 29, the end of the first upper connecting rod 110 and the end of the first lower connecting rod 310 of the present invention may be formed in a disc shape. The pin hole 340 in which the coupling pin 230 is inserted may be formed at a center of the disc of the first lower connecting rod 310. At this time, the coupling pin 230 is disposed to pass through the disc of the first lower connecting rod 310 and the disc of the first upper connecting rod 110.

[0114] As illustrated in the drawing, an insertion hole 118 in which the tension ring 700 is inserted is provided at the disc of the first upper connecting rod 110. Rail protrusions 119 are arranged at the insertion hole 118 as described above. The rail protrusions 199(119) are coupled with the rail grooves 709 formed at the tension ring 700. Meanwhile, although not shown in the drawings, the bearing having a center through which the coupling pin 230 passes may be disposed at a center of the disc of the first upper connecting rod 110. Alternatively, the bearing may be excluded, and only the tension ring 700 may be disposed at the center of the disc. In the case in which such a structure is employed, the elastic force is applied while the first lower connecting rod 310 is coupled to the tension ring 700 through the coupling pin 230 and rotated in a predetermined direction. Meanwhile, to support a rotating motion of the first upper connecting rod 110, the tension ring 700 may be manufactured and used

to be rotated in both of a clockwise direction and a counterclockwise direction.

[0115] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

[0116] The present invention relates to muscular exercise equipment. In particular, disclosed is a muscular exercise apparatus comprising: an upper support bar, which has a certain length and on both sides of which connecting rods are disposed; a lower support bar, which has a certain length and on both sides of which connecting rods are disposed, wherein the connecting rods of the upper support bar and the connecting rods of the lower support bar are fastened to each other such that the upper support bar and the lower support bar have a certain angle therebetween; and a central support bar for supporting the bending motion of at least one of the upper support bar and the lower support bar.

[0117] This application is a divisional application of European patent application no. 14 740 311.7 (the "parent application"), also published under no. 2 946 815. The following items corresponding to the originally filed claims of the parent application form part of the content of this description as filed.

[ITEMS]

[Item 1]

[0118] Muscular exercise equipment comprising:

an upper support bar having connecting rods disposed at both sides thereof and also having a predetermined length;
a lower support bar having connecting rods disposed at both sides thereof and also having a predetermined length; and
a central support bar to which the connecting rods of the upper support bar and the connecting rods of the lower support bar are coupled so that the upper support bar and the lower support bar has a predetermined contained angle, and which supports a bending motion of at least one of the upper support bar and the lower support bar, and is provided to be rolled.

[Item 2]

[0119] The muscular exercise equipment of item 1, wherein the upper support bar comprises a first upper connecting rod coupled to one end of the central support bar; and a second upper connecting rod coupled to the other end of the central support bar, and the lower support bar comprises a first lower connecting rod coupled to one end of the central support bar; and a second lower connecting rod coupled to the other end of the central support bar.

[Item 3]

[0120] The muscular exercise equipment of item 1, wherein the central support bar comprises an elastic member configured to support the support bars to be returned to their original positions according to a bending motion, when at least one of the upper support bar and the lower support bar performs the bending motion.

[Item 4]

[0121] The muscular exercise equipment of item 1, wherein an embossing treatment is performed on a surface of the central support bar.

[Item 5]

[0122] The muscular exercise equipment of item 1, wherein at least one of the upper support bar and the lower support bar is provided to be rolled.

[Item 6]

[0123] The muscular exercise equipment of item 1, wherein the connecting rod is provided to be curved from an end of the support bar to the central support bar.

[Item 7]

[0124] The muscular exercise equipment of item 1, wherein the connecting rod comprises an extending portion configured to extend vertically from an end of the support bar; and a curved portion curved from the extending portion to the central support bar.

[Item 8]

[0125] The muscular exercise equipment of item 1, wherein the central support bar is formed of a flat spring having a predetermined length.

[Item 9]

[0126] The muscular exercise equipment of item 1, further comprising an assistant device comprising a handle portion, connecting portions which are vertically connected to both ends of the handle portion, extending portions configured to have a predetermined angle with respect to the connecting portions and to extend from ends of the connecting portions, and protruding portions configured to vertically protrude from ends of the extending portions and inserted and coupled into both sides of the central support bar.

[Item 10]

[0127] The muscular exercise equipment of item 1, further comprising at least one of a first assistant unit having a first handle, a first support portion disposed perpendicularly to the first handle, a first upper joint configured to vertically connect the first handle with the first support portion and also to support the first handle to be bent by elasticity, a first lower joint connected with the first support portion and configured to support the first support portion to be returned to its original position by predetermined elasticity, and a first coupling portion connected with the first lower joint and coupled to one side of the central support bar; and
a second assistant unit having a second handle, a second support portion disposed perpendicularly to the second handle, a second upper joint configured to vertically connect the second handle with the second support portion and also to support the second handle to be bent by elasticity, a second lower joint connected with the second support portion and configured to support the second support portion to be returned to its original position by predetermined elasticity, and a second coupling portion connected with the second lower joint and coupled to the other side of a second central support bar.

[Item 11]

[0128] Muscular exercise equipment comprising:

a first upper support bar having a first upper connecting rod disposed at one side thereof and also having a predetermined length;
a first lower support bar having a first lower connecting rod disposed at one side thereof and also having a predetermined length; and
a first central support bar in which the first upper connecting rod of the first upper support bar and the first lower connecting rod of the first lower support bar are coupled to one side thereof so that the first upper support bar and the first lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the first upper support bar and the first lower support bar.

[Item 12]

[0129] The muscular exercise equipment of item 11, further comprising separate muscular exercise equipment comprising a second upper support bar having a second upper connecting rod disposed at the other side thereof and also having a predetermined length, a second lower support bar having a second lower connecting rod disposed at the other side thereof and also having a predetermined length, and a second central support bar in which the second upper connecting rod of the second upper support bar and the second lower connecting rod of the second lower support bar are coupled to the other side thereof so that the second upper support bar and the second lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the second upper support bar and the second lower support bar,
wherein the separate muscular exercise equipment is coupled so that the second upper connecting rod faces the first upper connecting rod, and the second lower connecting rod faces the first lower connecting rod.

[Item 13]

[0130] The muscular exercise equipment of item 12, further comprising separate muscular exercise equipment comprising a second upper support bar having a second upper connecting rod disposed at the other side thereof and also having a predetermined length, a second lower support bar having a second lower connecting rod disposed at the other side thereof and also having a predetermined length, and a second central support bar in which the second upper connecting rod of the second upper support bar and the second lower connecting rod of the second lower support bar are coupled to the other side thereof so that the second upper support bar and the second lower support bar have a predetermined contained angle, and which supports a bending motion of at least one of the second upper support bar and the second lower support bar; and
a coupling structure configured to connect at least one pair of the first and second upper support bars, the first and second lower support bars, and the first and second central support bars with each other.

[Item 14]

[0131] The muscular exercise equipment of item 11, wherein the central support bar comprises an elastic member configured to support the support bars to be returned to their original positions according to a bending motion, when at least one of the upper support bar and the lower support bar performs the bending motion.

[Item 15]

[0132] The muscular exercise equipment of item 11, wherein the central support bar is provided to be rolled.

[Item 16]

[0133] The muscular exercise equipment of item 11, wherein an embossing treatment is performed on a surface of the central support bar.

[Item 17]

[0134] The muscular exercise equipment of item 11, wherein at least one of the upper support bar and the lower support bar is provided to be rolled.

[Item 18]

[0135] The muscular exercise equipment of item 11, wherein the connecting rod is provided to be curved from an end of the support bar to the central support bar.

[Item 19]

[0136] The muscular exercise equipment of item 11, wherein the connecting rod comprises an extending portion configured to extend vertically from an end of the support bar; and a curved portion curved from the extending portion to the central support bar.

[Item 20]

[0137] The muscular exercise equipment of item 11, wherein the central support bar is formed of a flat spring having a predetermined length.

[Item 21]

[0138] The muscular exercise equipment of item 11, further comprising an assistant device comprising a handle portion, connecting portions which are vertically connected to both ends of the handle portion, extending portions configured to have a predetermined angle with respect to the connecting portions and to extend from ends of the connecting portions, and protruding portions configured to vertically protrude from ends of the extending portions and inserted and coupled into both sides of the central support bar.

[Item 22]

[0139] The muscular exercise equipment of item 11, further comprising at least one of a first assistant unit having a first handle, a first support portion disposed perpendicularly to the first handle, a first upper joint configured to vertically connect the first handle with the first support portion and also to support the first handle to be bent by elasticity, a first lower joint connected with the first support portion and configured to support the first support portion to be returned to its original position by predetermined elasticity, and a first coupling portion connected with the first lower joint and coupled to one side of the central support bar; and

a second assistant unit having a second handle, a second support portion disposed perpendicularly to the second handle, a second upper joint configured to vertically connect the second handle with the second support portion and also to support the second handle to be bent by elasticity, a second lower joint connected with the second support portion and configured to support the second support portion to be returned to its original position by predetermined elasticity, and a second coupling portion connected with the second lower joint and coupled to the other side of a second central support bar.

[Item 23]

[0140] Muscular exercise equipment comprising:

a first module comprising an upper support bar, and upper connecting rods connected at both ends of the upper support bar;

a second module comprising a lower support bar, and lower connecting rods connected at both ends of the lower support bar; and

a central support bar coupled to ends of the upper and lower connecting rods,

wherein stepped portions are formed so that the ends of the upper connecting rods and the lower connecting rods are coupled so as to face each other, and the central support bar is disposed at an area in which the stepped portions are coupled, and

a tension ring configured to provide an elastic force in an opposite direction to a rotating motion of at least one of the first and second modules using the central support bar as an axis is inserted in and disposed at the stepped portion of the upper connecting rods.

[Item 24]

[0141] The muscular exercise equipment of item 23, wherein a pin hole configured to pass through toward the central support bar, and a coupling pin inserted into and passing through the pin hole and coupled to a center of the tension ring disposed at the stepped portion of the upper connecting rods are disposed at the stepped portion of the lower connecting rods.

[Item 25]

[0142] The muscular exercise equipment of item 24, wherein a pin cover configured to cover an opening portion of the pin hole is further disposed at the stepped portion of the lower connecting rods.

[Item 26]

[0143] The muscular exercise equipment of item 24, wherein a bearing having a center through which the coupling pin passes and configured to support a rotation of the upper connecting rod, and an insertion hole configured to support an insertion of the tension ring are disposed at the stepped portion of the upper connecting rods.

[Item 27]

[0144] The muscular exercise equipment of item 26, wherein the tension ring comprises at least one rail groove formed at an outer portion thereof; and a ring screw thread formed at the outer portion to be fastened to a coupling nut disposed at the central supporting bar, and a pin insertion hole in which the coupling pin is in-

serted and coupled.

[Item 28]

[0145] The muscular exercise equipment of item 27, further comprising a rail protrusion formed at one side of an inner wall of the insertion hole formed at the upper connecting rod, and coupled to the rail groove.

Claims

1. Muscular exercise equipment comprising:

   a first module comprising an upper support bar, and upper connecting rods connected at both ends of the upper support bar;
   a second module comprising a lower support bar, and lower connecting rods connected at both ends of the lower support bar; and
   a central support bar coupled to ends of the upper and lower connecting rods,
   wherein stepped portions are formed so that the ends of the upper connecting rods and the lower connecting rods are coupled so as to face each other, and the central support bar is disposed at an area in which the stepped portions are coupled, and
   a tension ring configured to provide an elastic force in an opposite direction to a rotating motion of at least one of the first and second modules using the central support bar as an axis is inserted in and disposed at the stepped portion of the upper connecting rods.

2. The muscular exercise equipment of claim 1, wherein a pin hole configured to pass through toward the central support bar, and a coupling pin inserted into and passing through the pin hole and coupled to a center of the tension ring disposed at the stepped portion of the upper connecting rods are disposed at the stepped portion of the lower connecting rods.

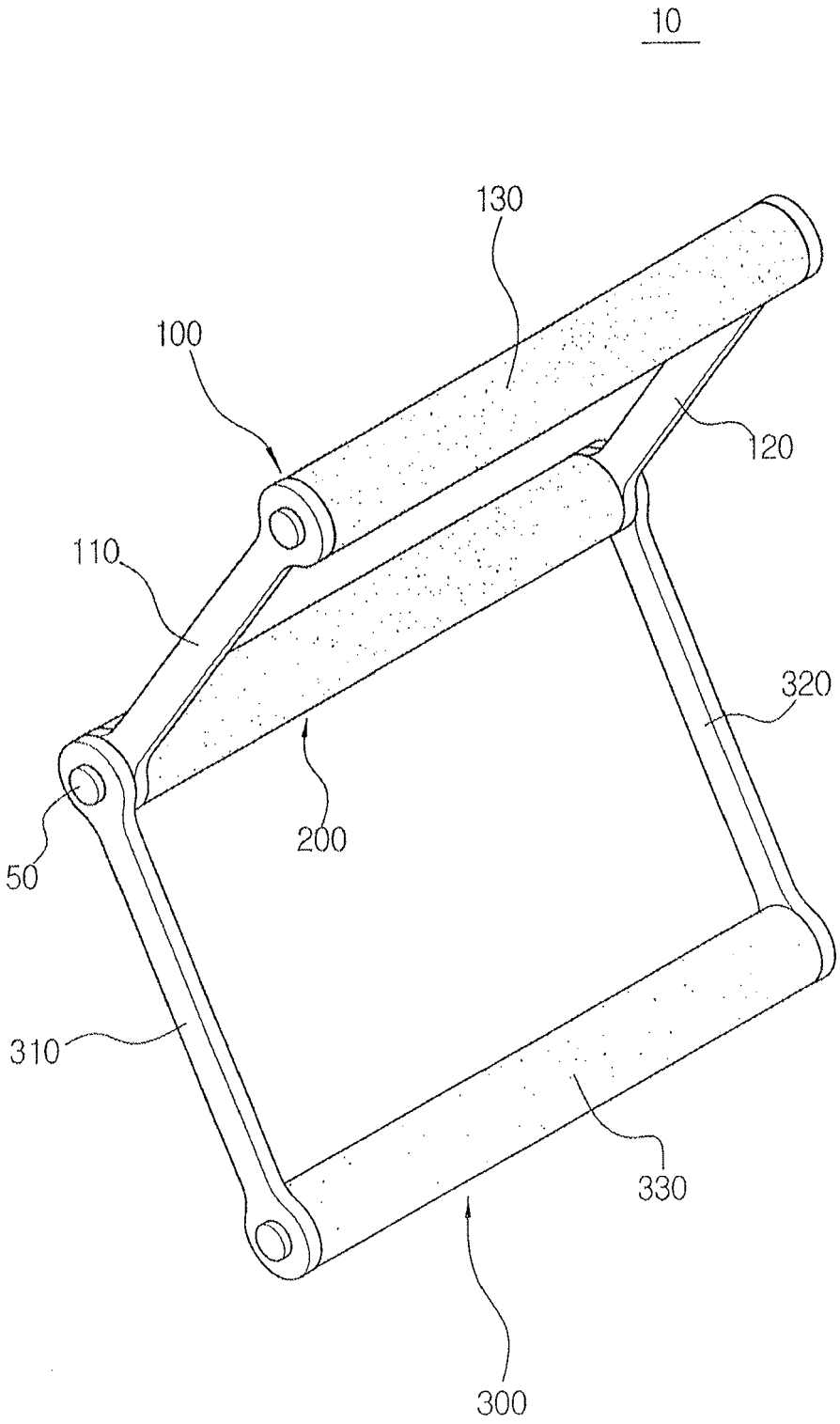
3. The muscular exercise equipment of claim 2, wherein a pin cover configured to cover an opening portion of the pin hole is further disposed at the stepped portion of the lower connecting rods.

4. The muscular exercise equipment of claim 2, wherein a bearing having a center through which the coupling pin passes and configured to support a rotation of the upper connecting rod, and an insertion hole configured to support an insertion of the tension ring are disposed at the stepped portion of the upper connecting rods.

5. The muscular exercise equipment of claim 4, wherein the tension ring comprises at least one rail groove formed at an outer portion thereof; and a ring screw thread formed at the outer portion to be fastened to a coupling nut disposed at the central supporting bar, and a pin insertion hole in which the coupling pin is inserted and coupled.

6. The muscular exercise equipment of claim 5, further comprising a rail protrusion formed at one side of an inner wall of the insertion hole formed at the upper connecting rod, and coupled to the rail groove.

FIG1.



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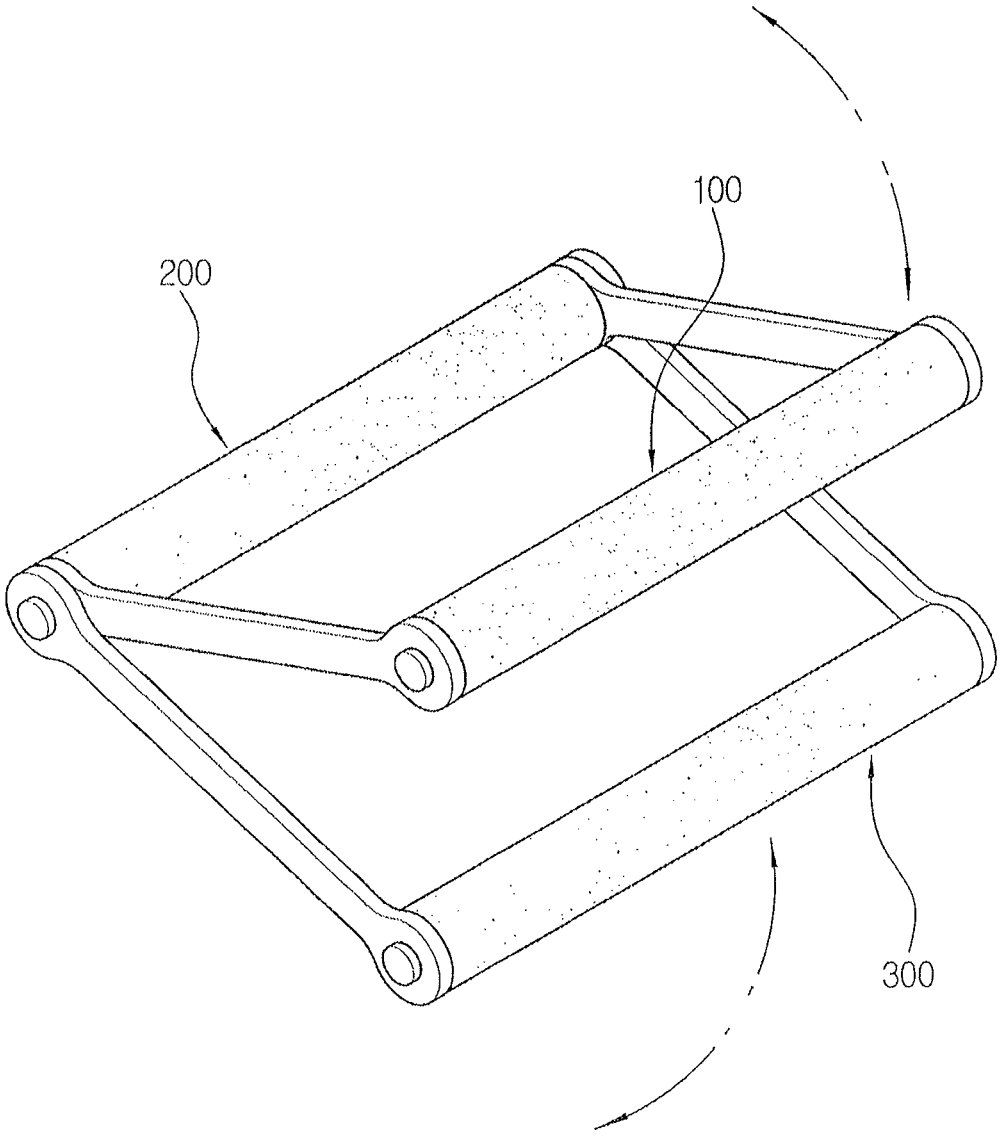

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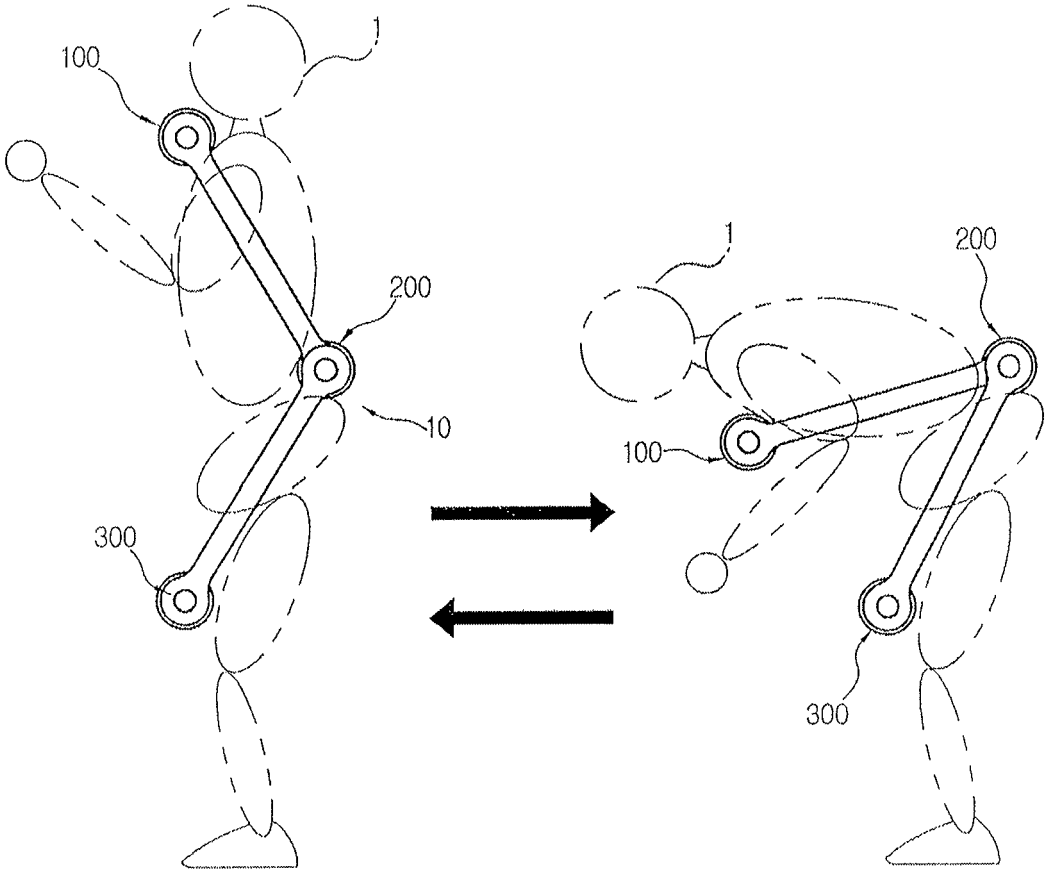

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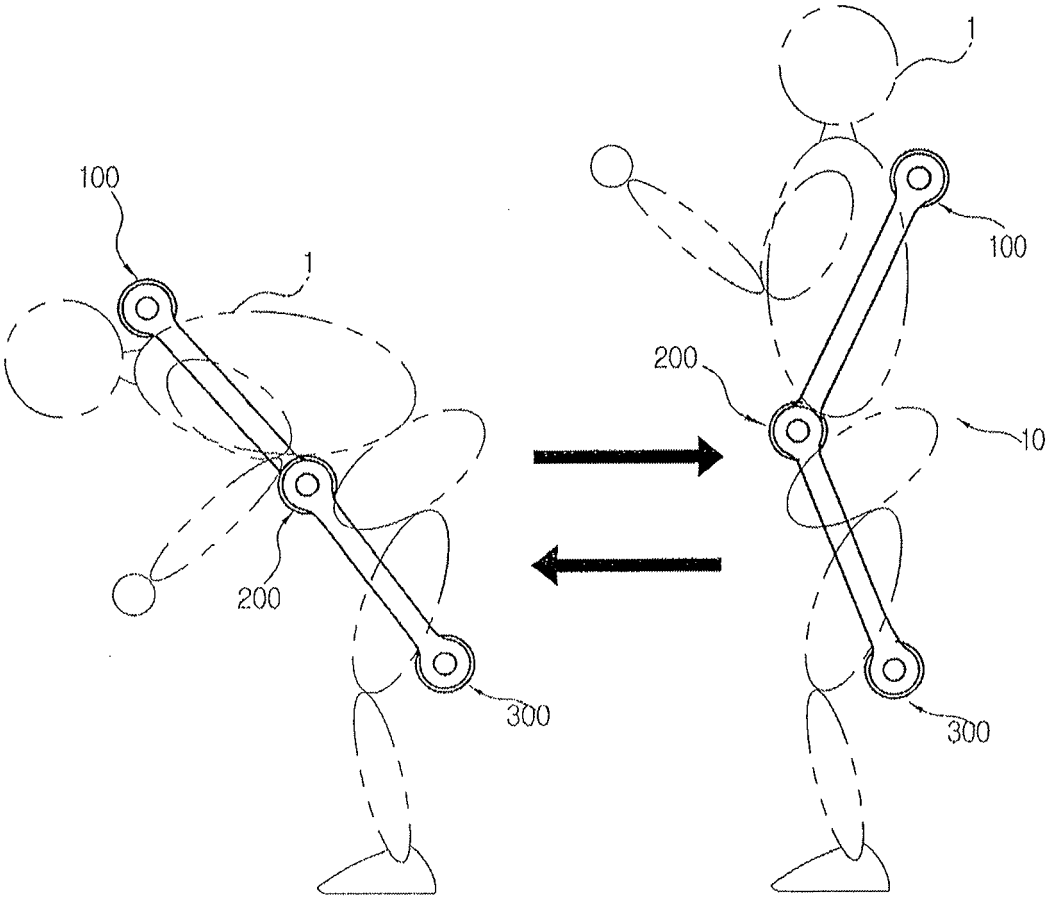

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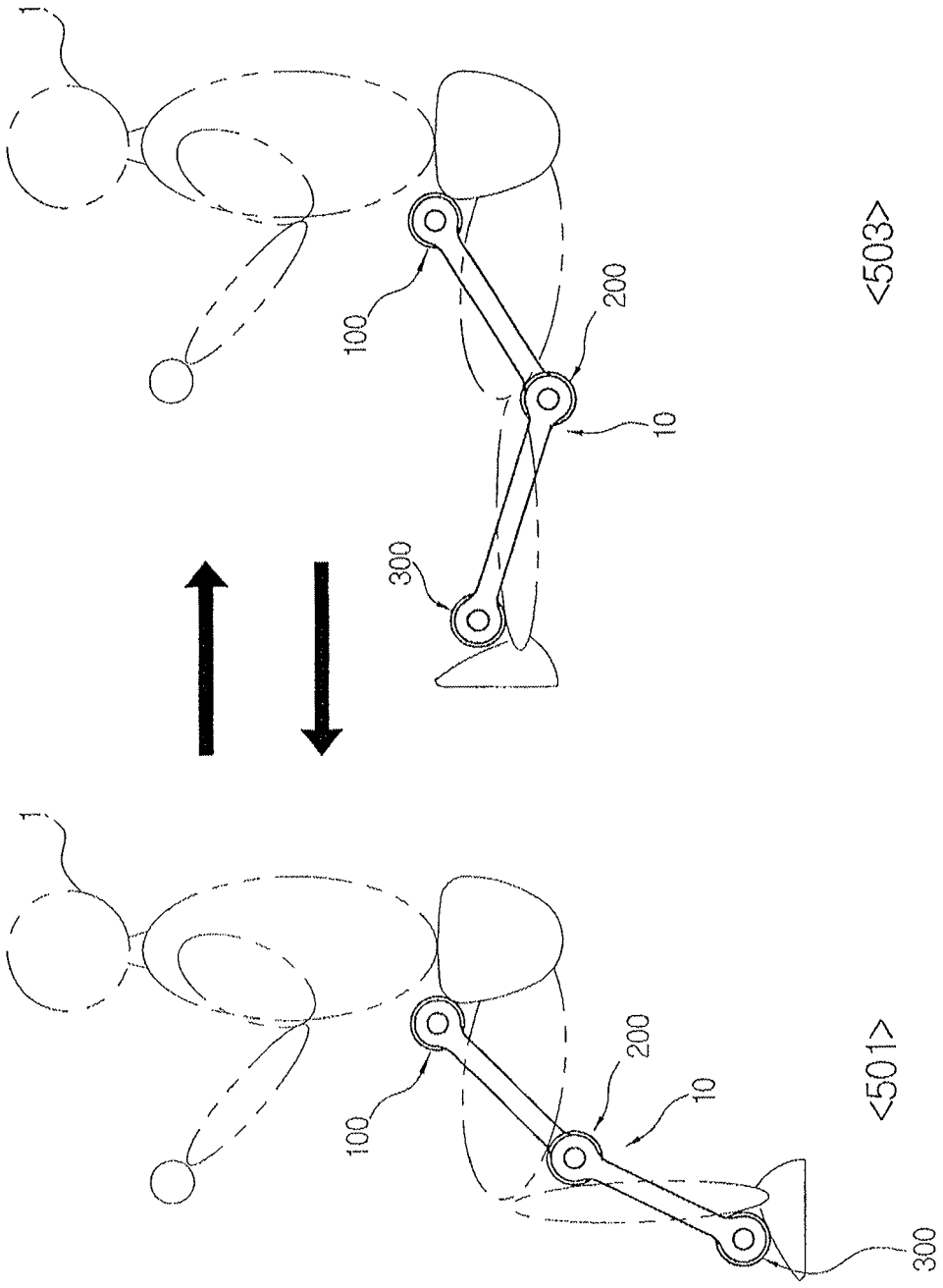

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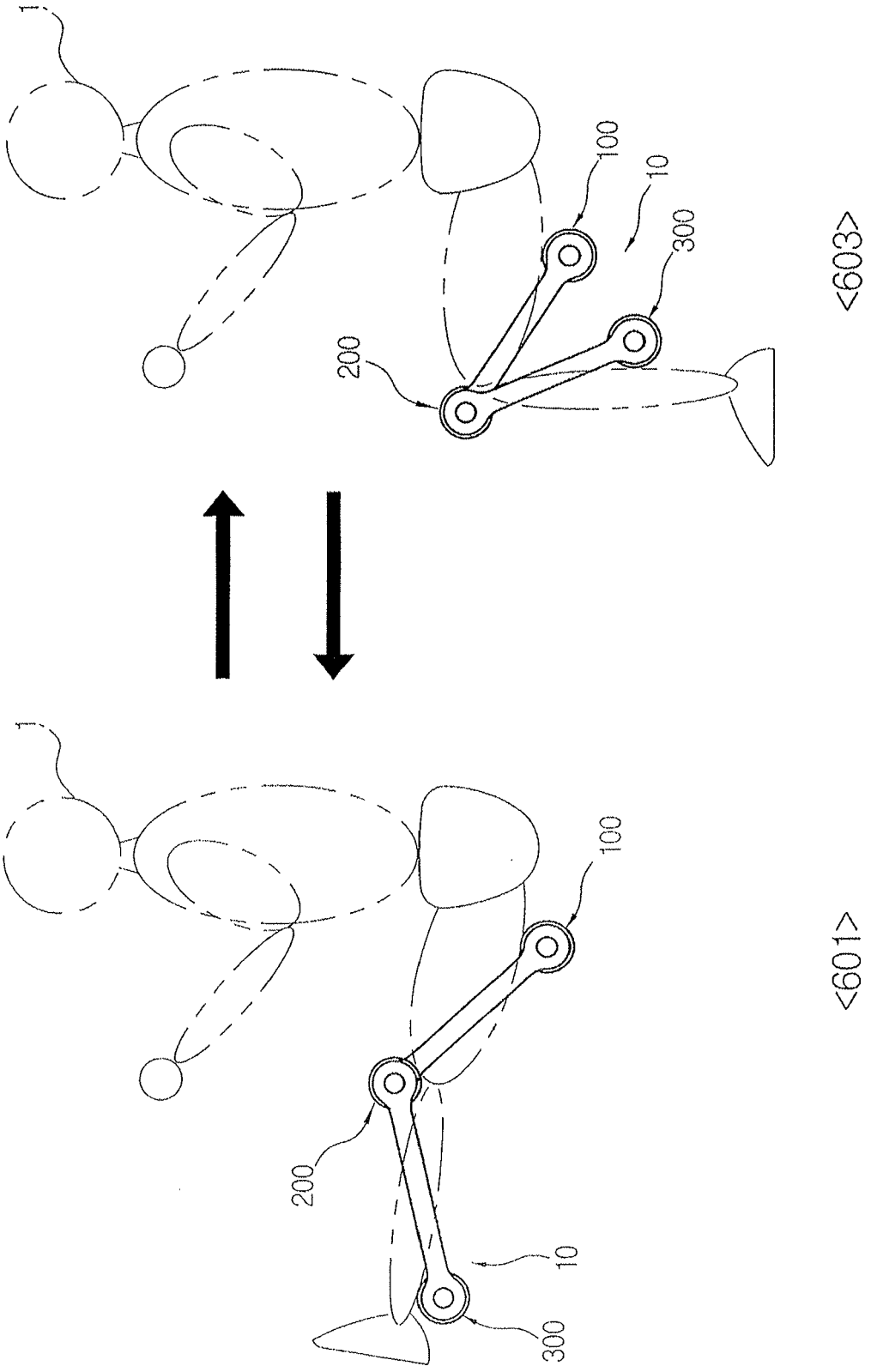

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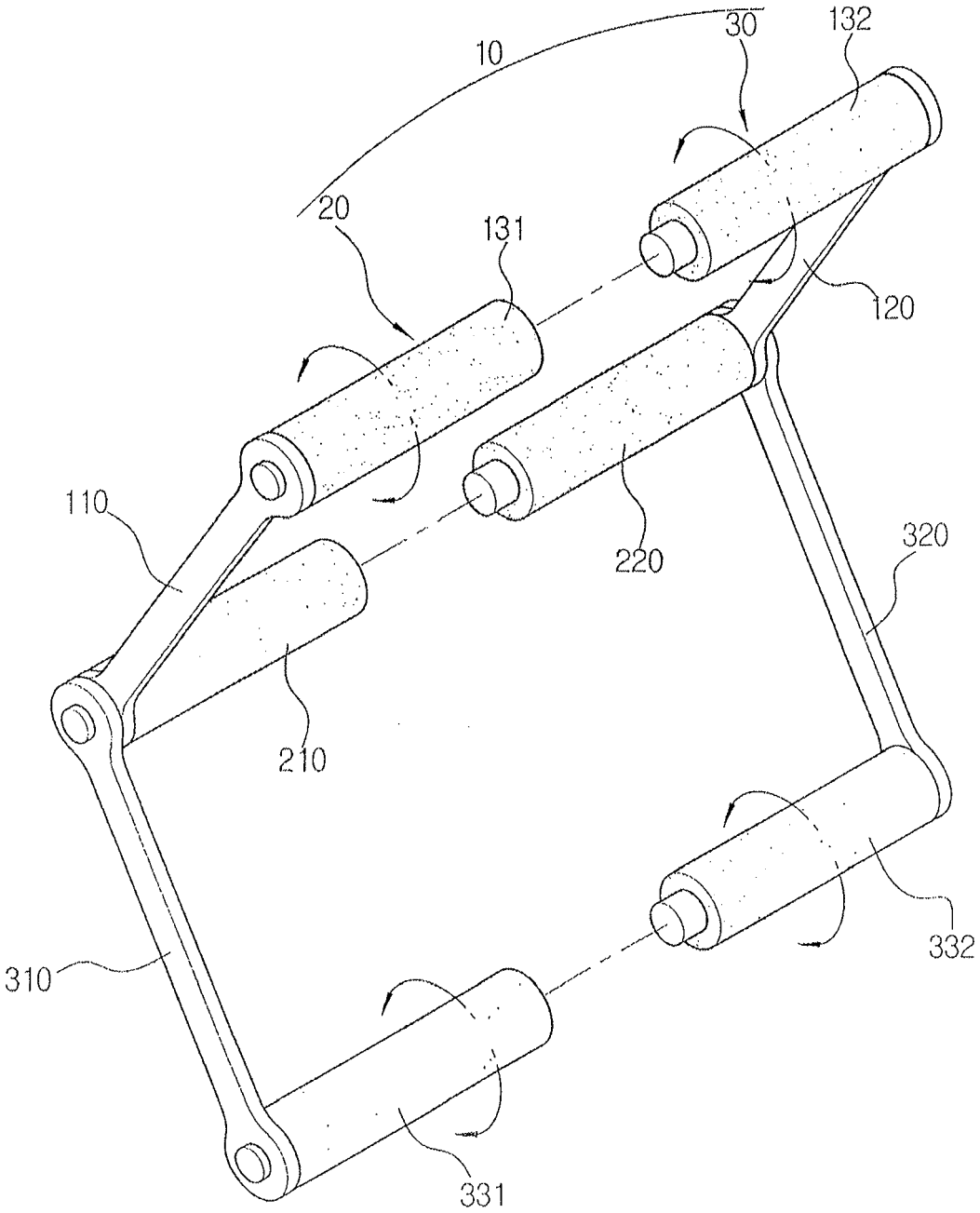

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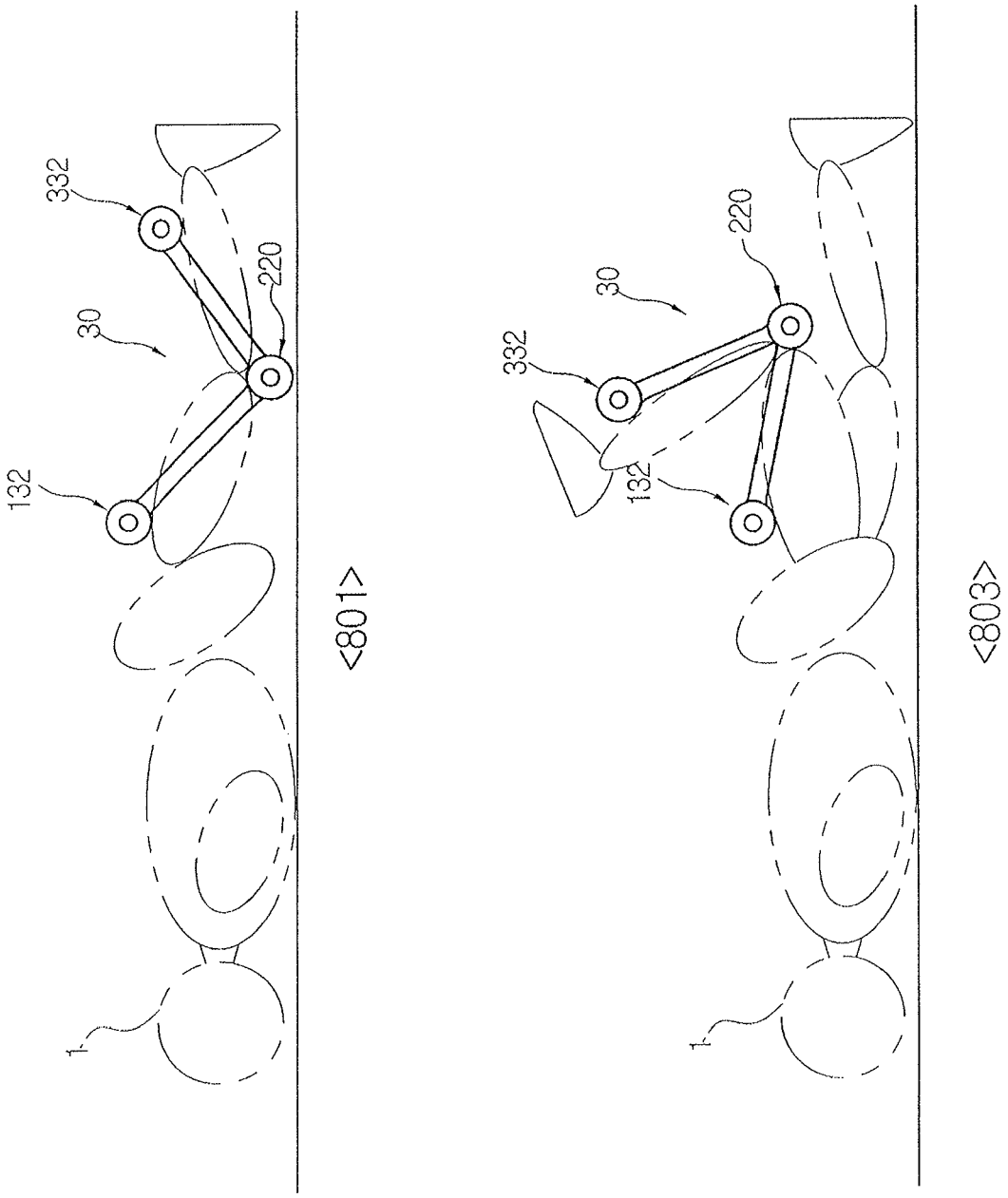

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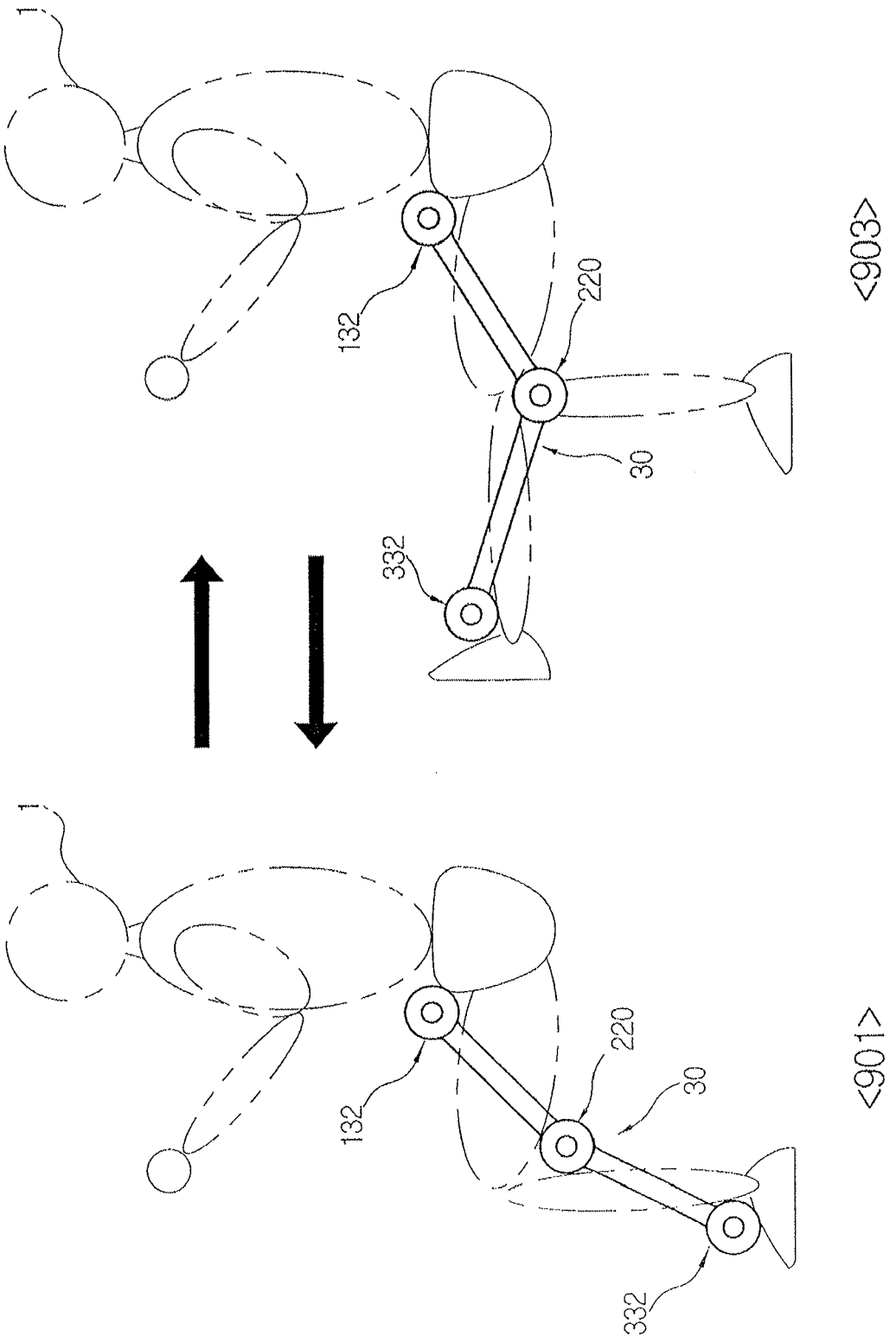
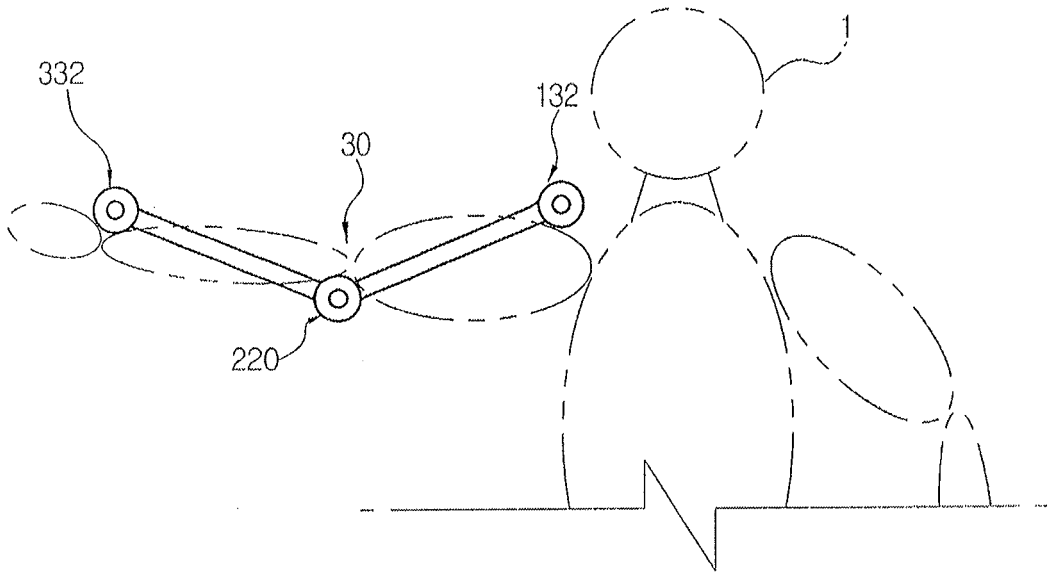


FIG10



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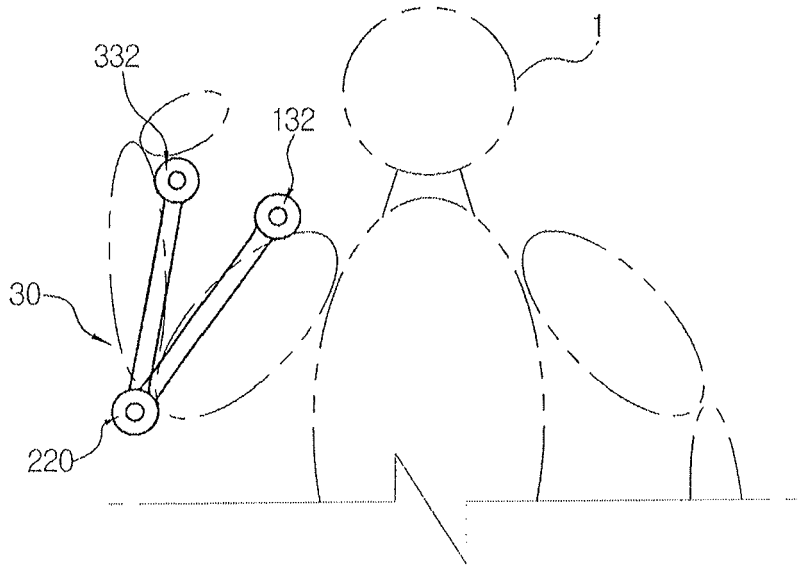

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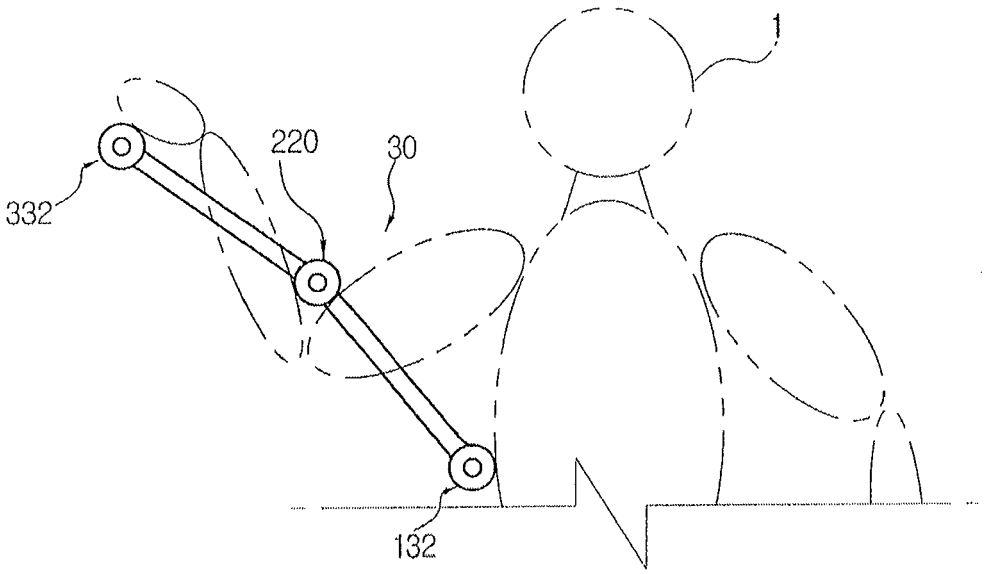

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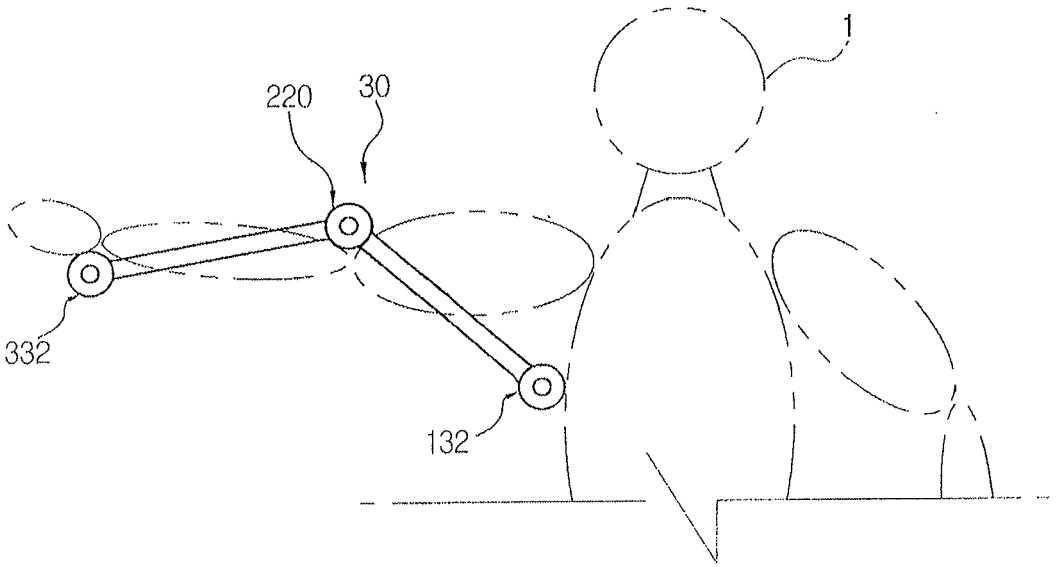

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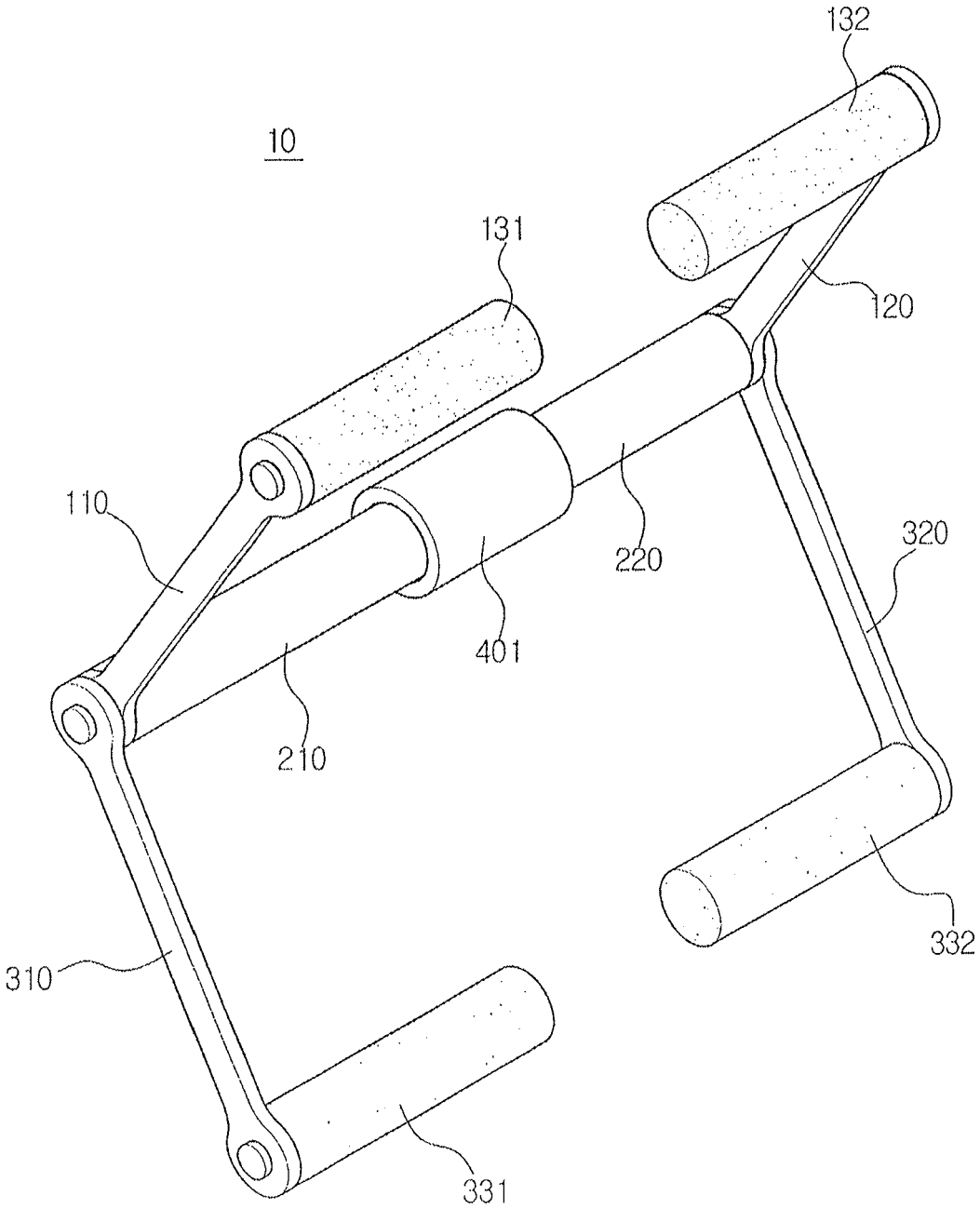

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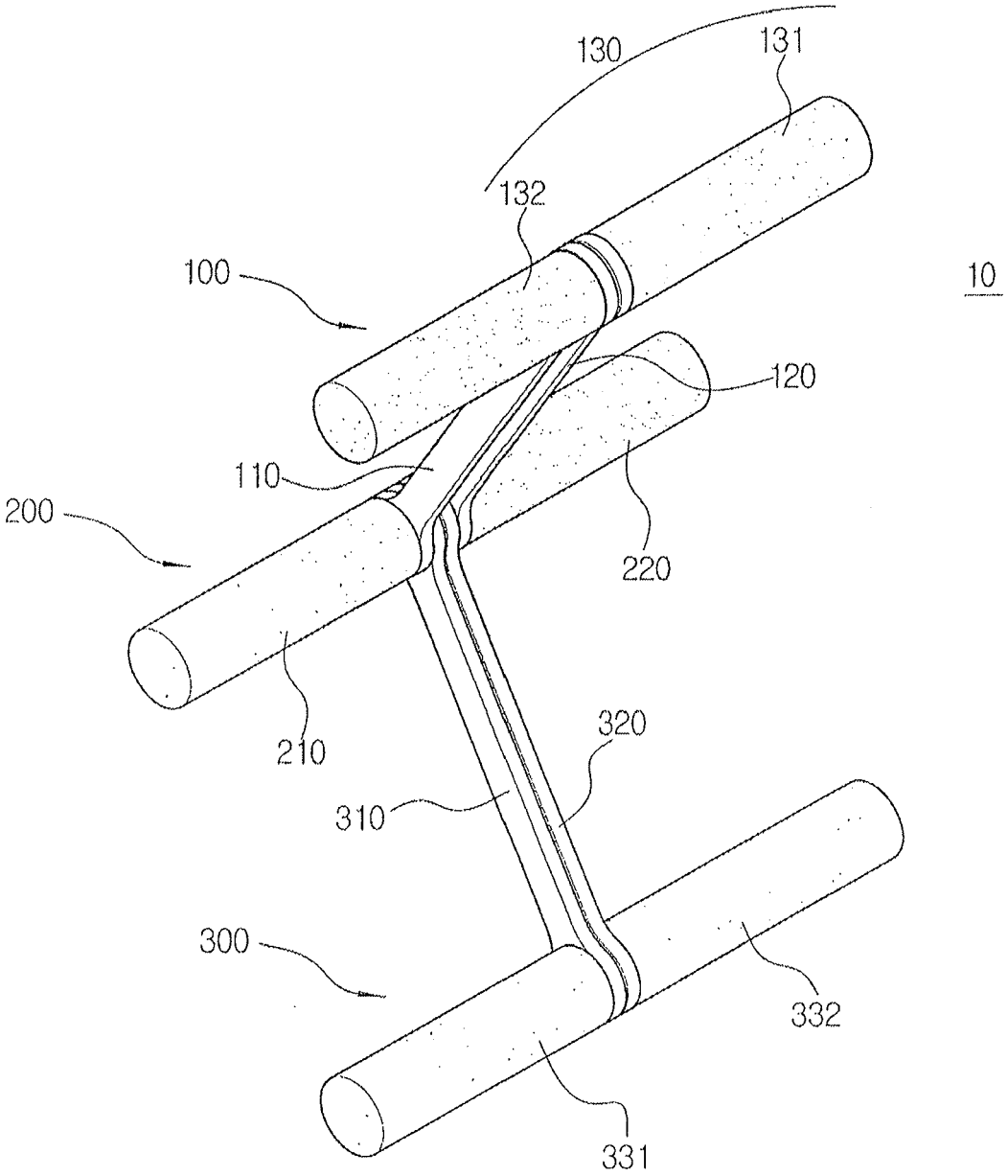

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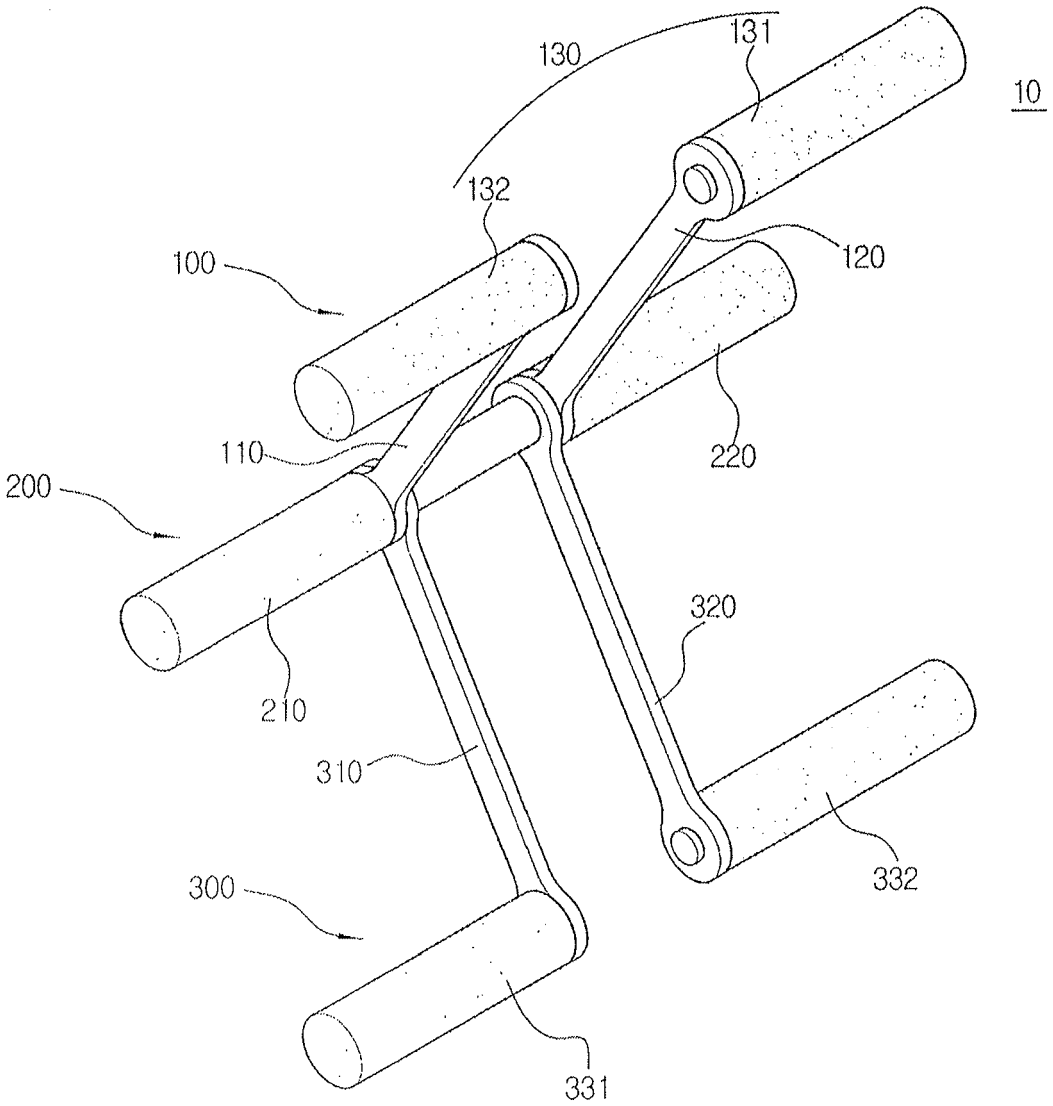

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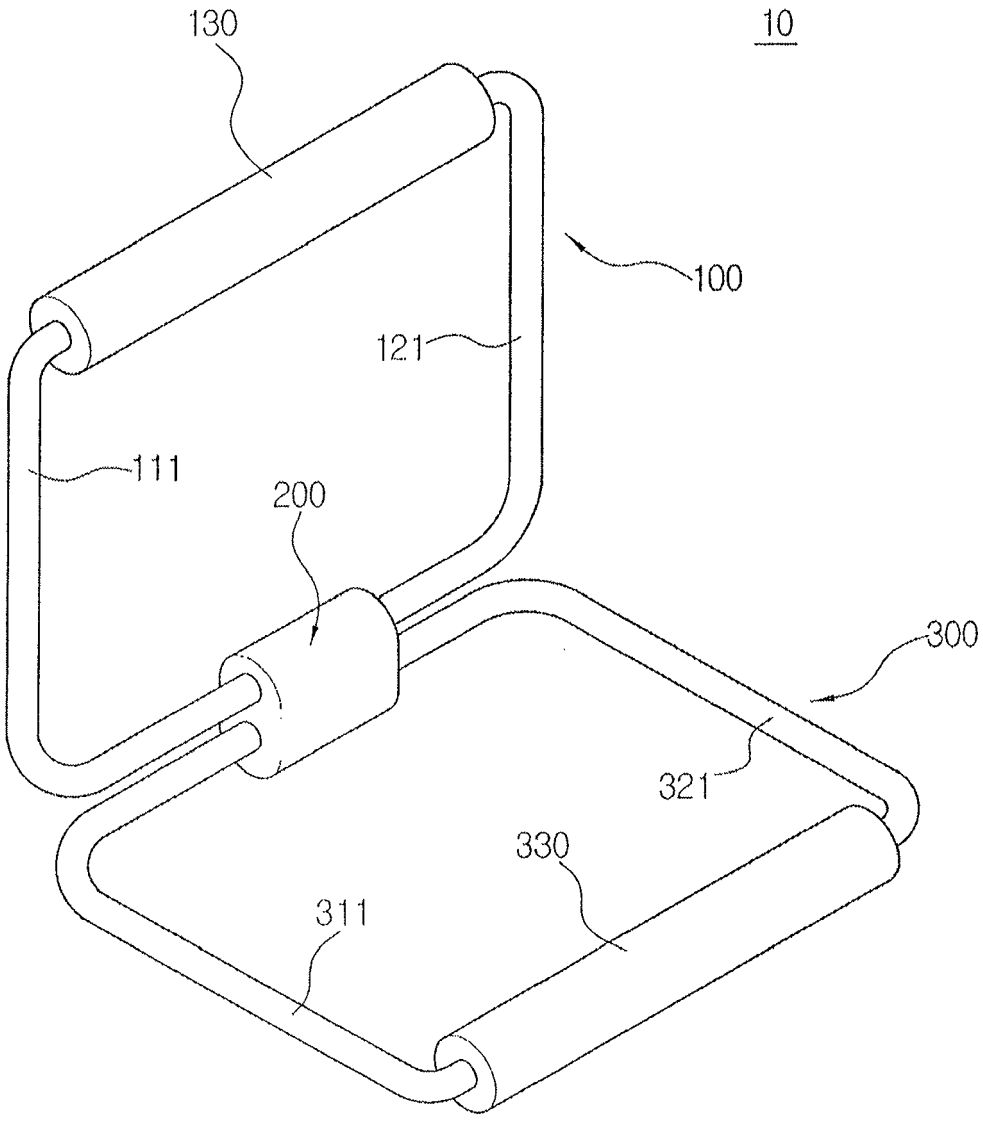

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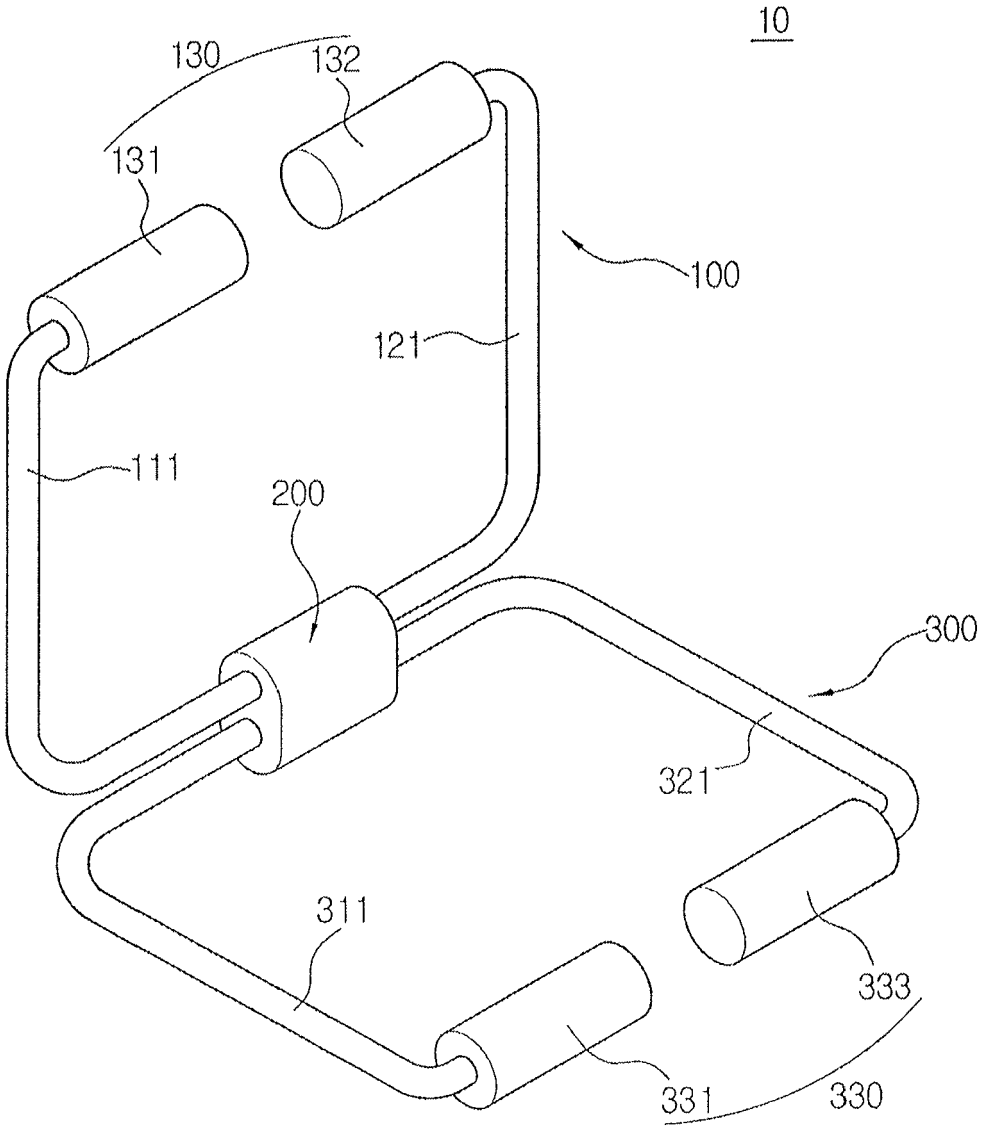

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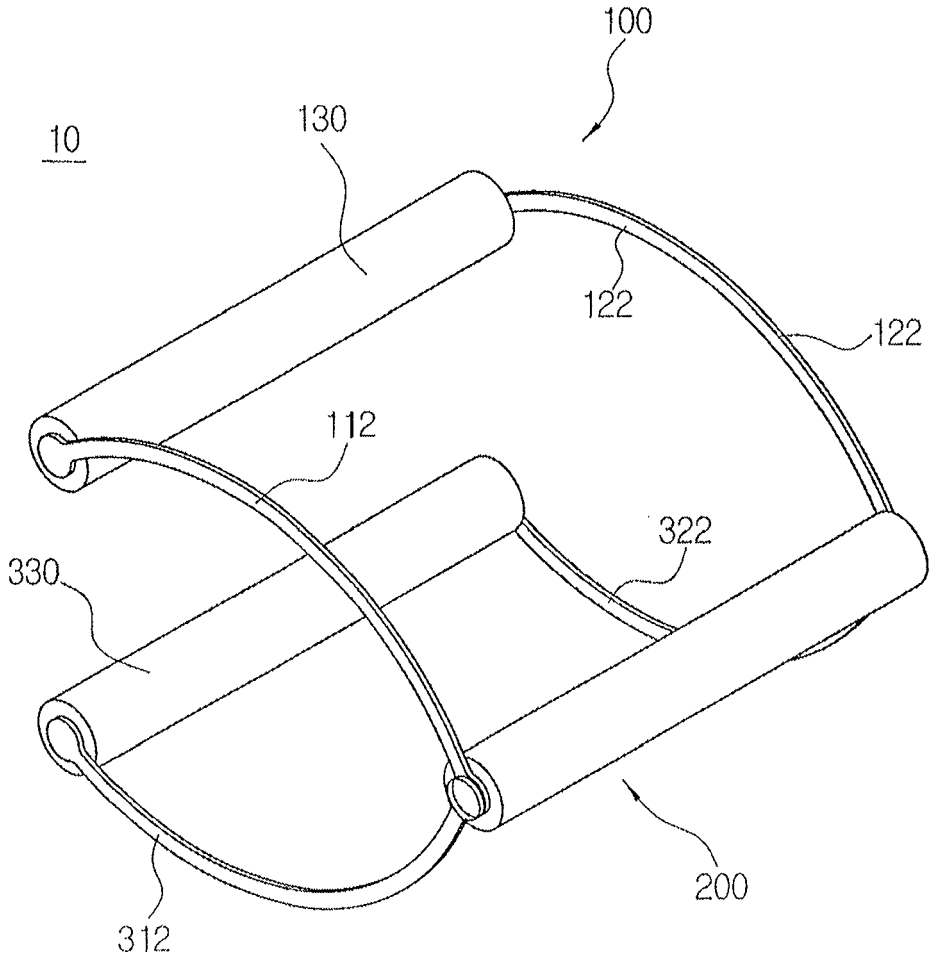

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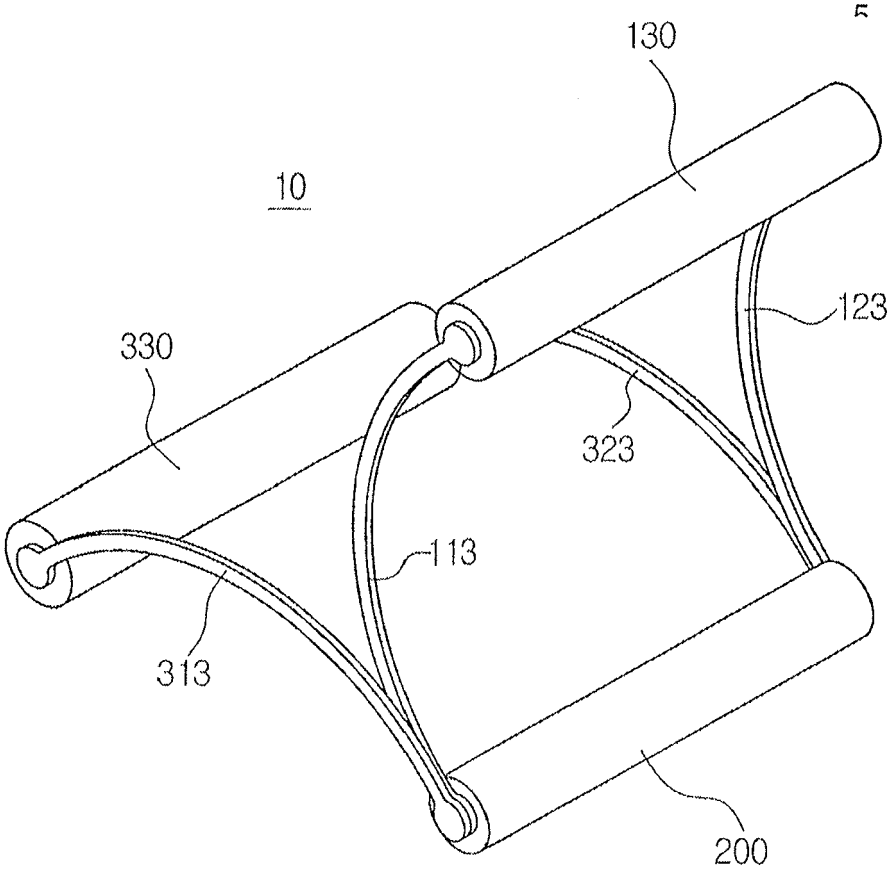

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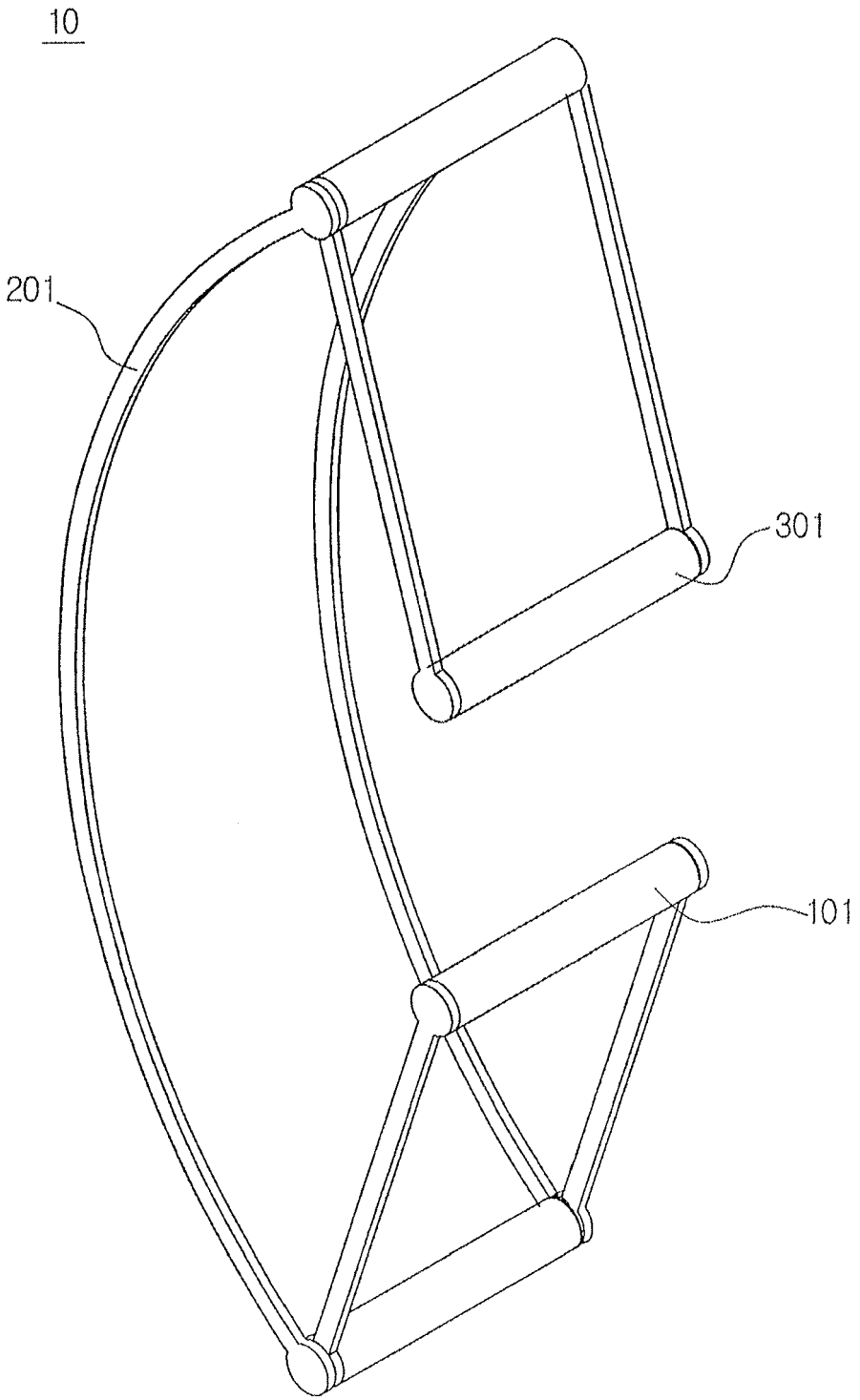
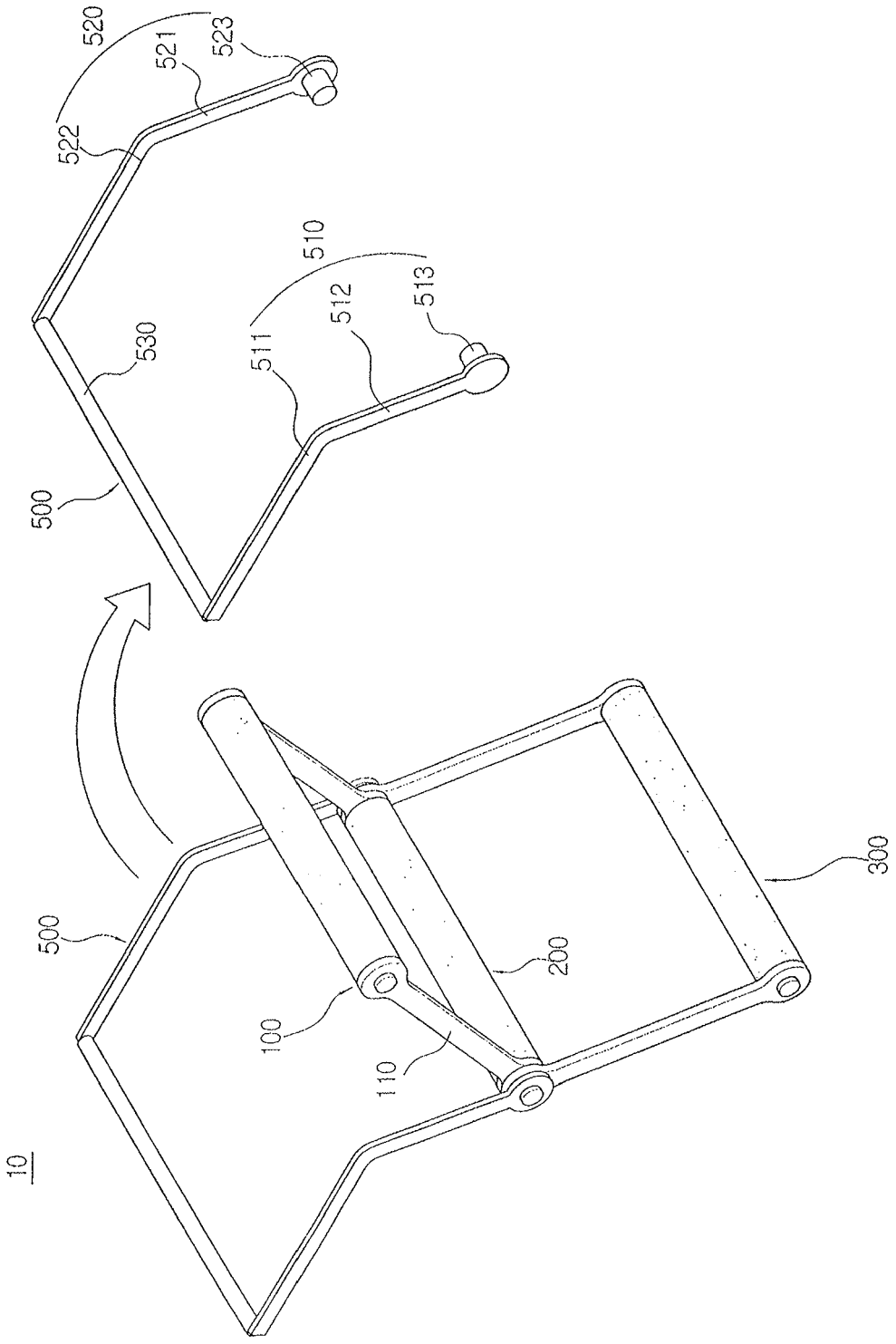


FIG20.



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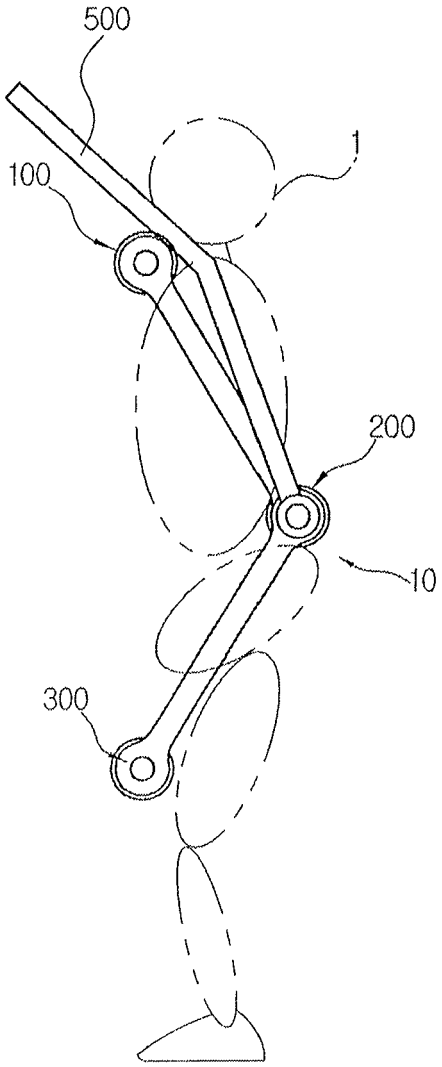

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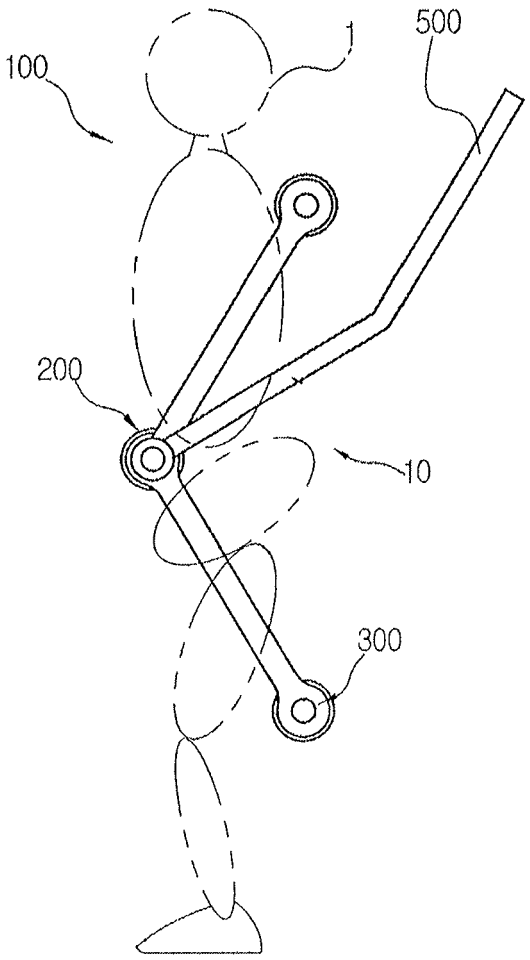

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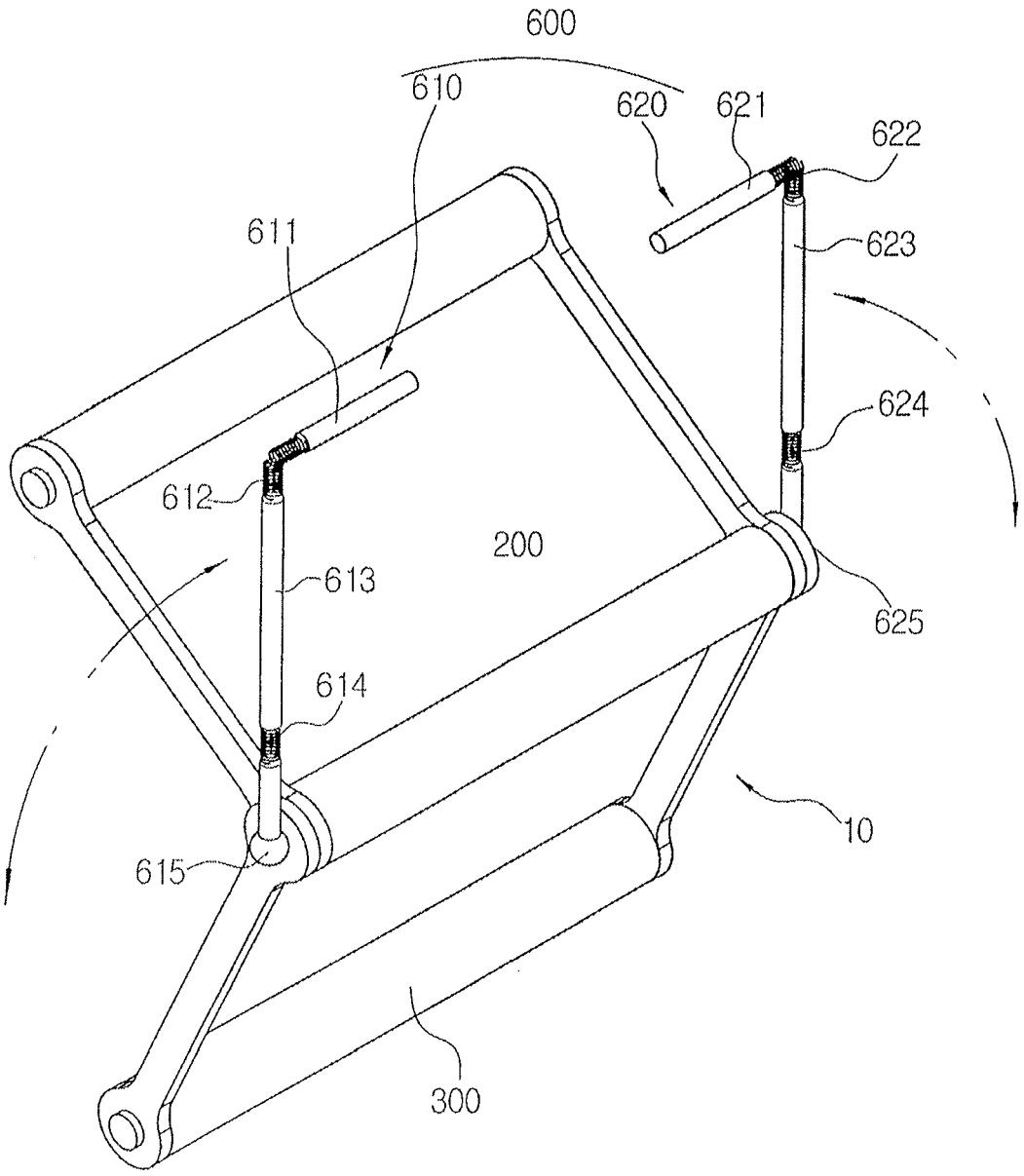

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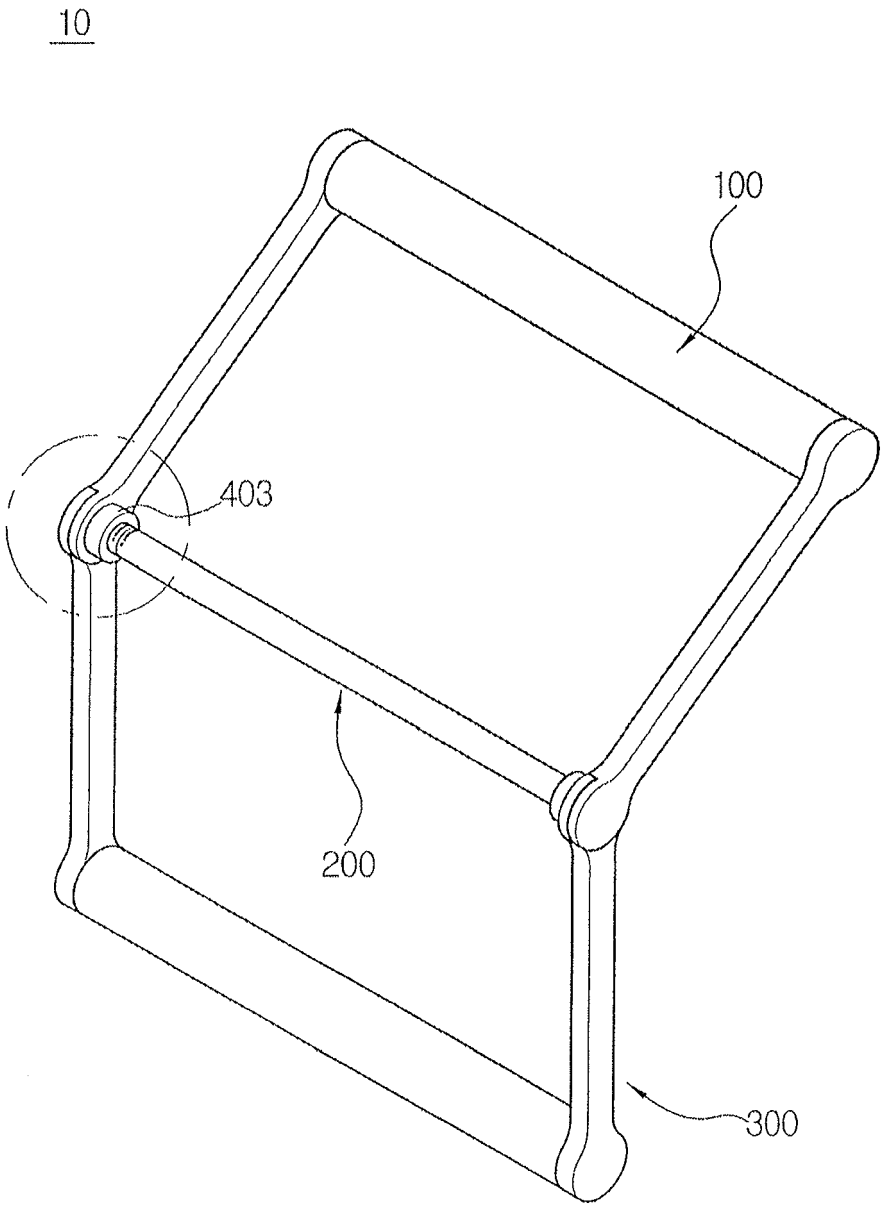

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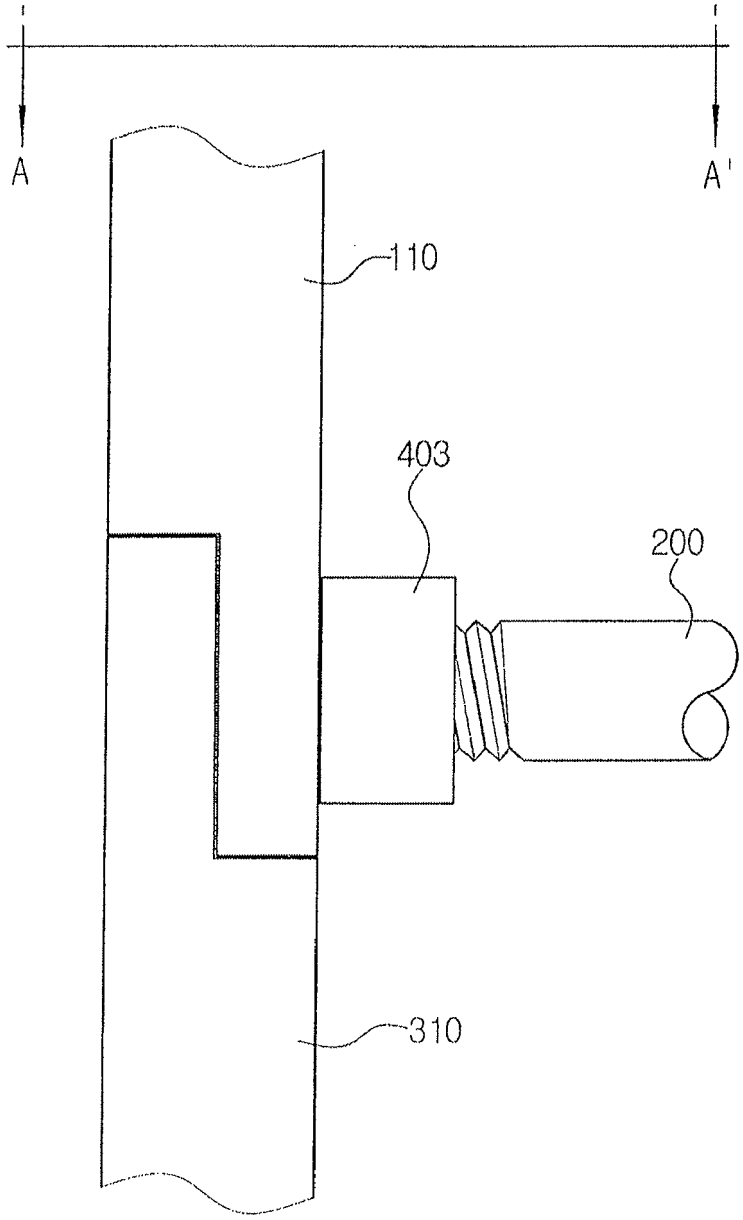

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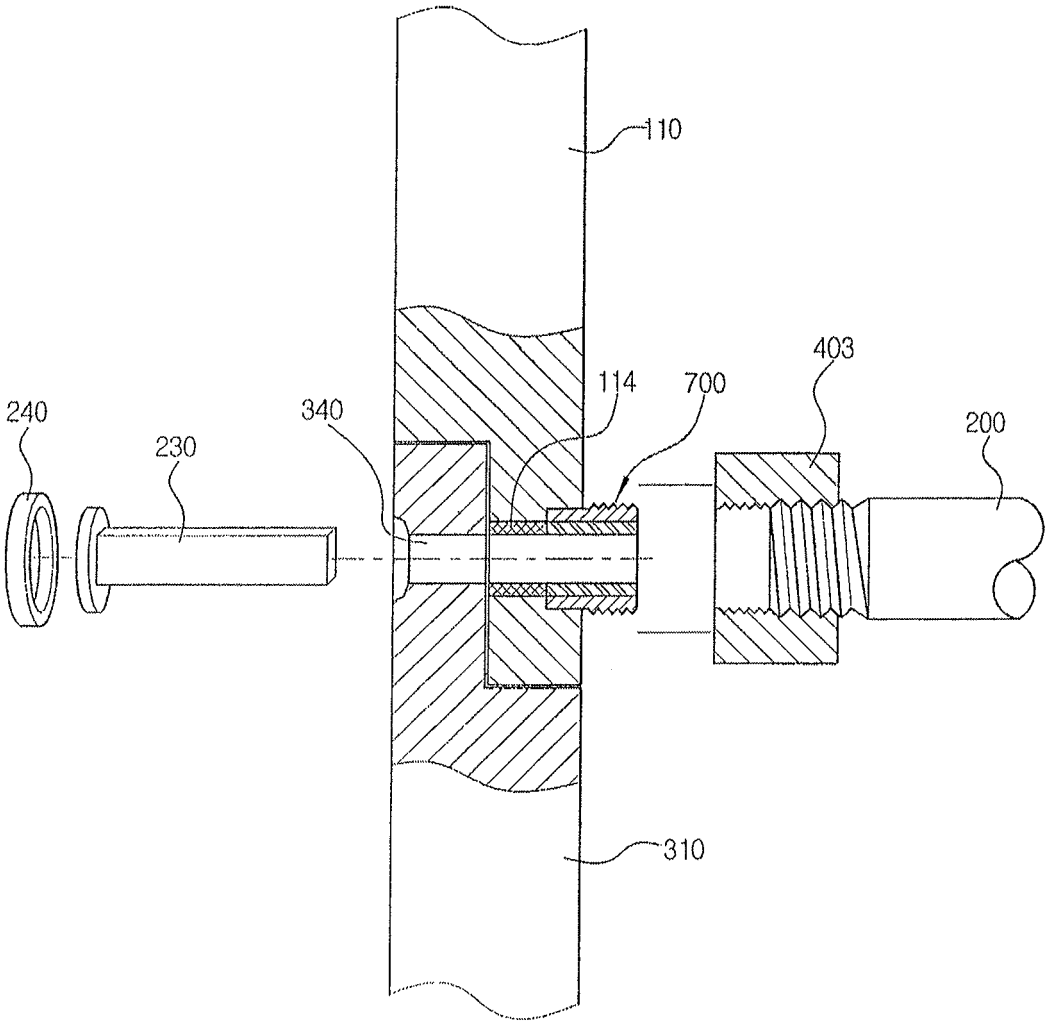

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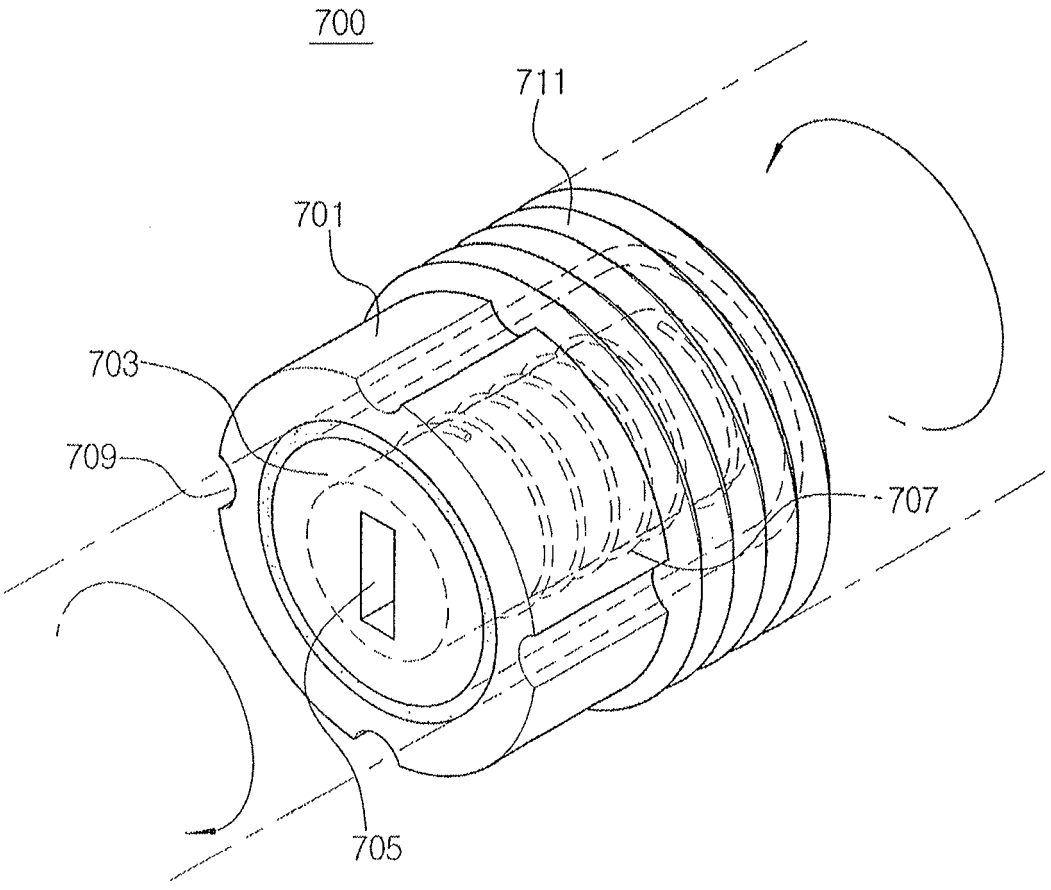


FIG27.

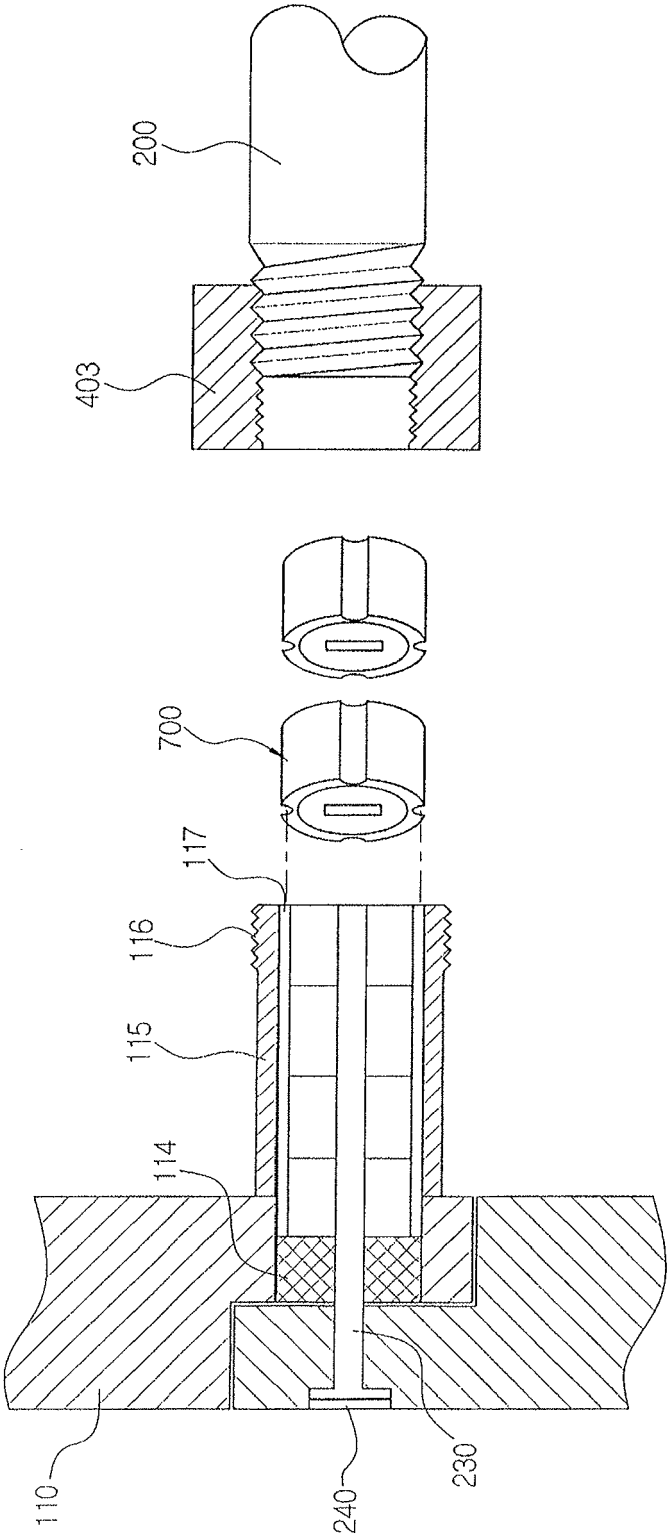


FIG28.

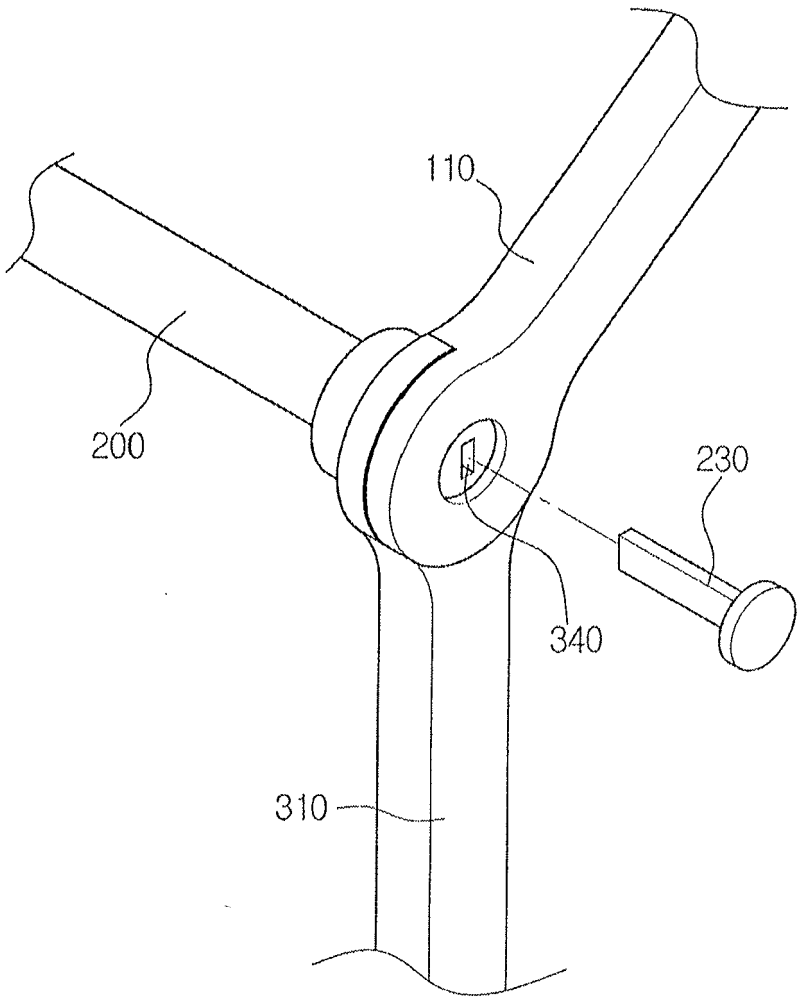
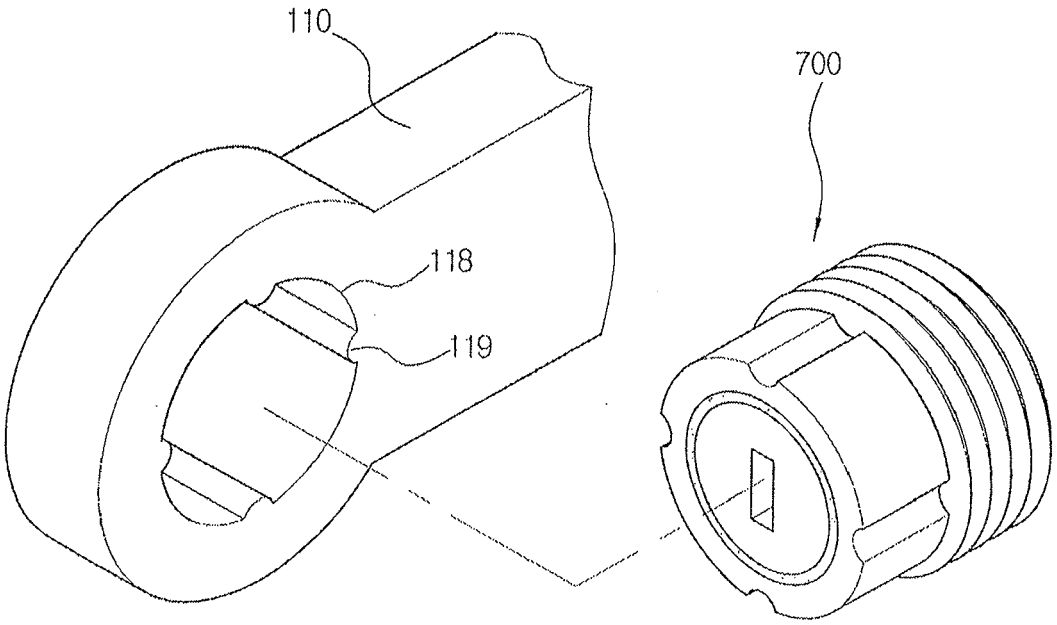


FIG29.



Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 17 17 9721

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Place of search	Date of completion of the search	Examiner
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