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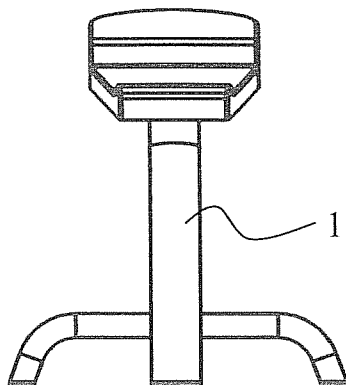
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(54) Title: METHOD FOR STRETCHING MUSCLES AND STRETCHING APPARATUS



(57) Abstract: The present invention relates to a method for stretching muscles and a stretching apparatus that allows stretching one or more muscles in the body. The apparatus comprises a frame (1) and at least a bench (2) arranged above the base. The bench comprises a specific damped support surface (3) to receive one of the user's body parts during the stretching movement. The support surface comprises indentations (4) and/or projections (5) in order to resist and to support the body part while the stretching movement is carried out.

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METHOD FOR STRETCHING MUSCLES AND STRETCHING APPARATUS

BACKGROUND

[0001] The present invention relates to a stretching apparatus according to the preamble of claim 1. Such an apparatus is made especially to resist and treat muscle contraction and overload being the result of for instance a too inactive lifestyle, exercise or too one-sided and monotonous movements. These muscular problems may for instance arise if one's work mainly includes sitting still or standing still, or through training. It is possible to prevent and attend to such muscular problems and to restore the muscular balance utilizing one or more stretching apparatuses.

PRIOR ART

[0002] The present lifestyle is largely characterized by inactivity. It is not necessary for people to move in a significant extent either at work or during spare-time. Such an inactivity with a one-sided and for instance often stationary body position, where the muscles remain in a contracted position, is a contributory cause to the constantly increasing ill-health. When one is for instance sitting, the muscles at the back of the thighs and what are known as the hip-flexing muscles at the groins remain in a contracted position for a significant part of the day. The muscles adapt themselves to the use they are exposed to. Similarly as a muscle is strengthened when it is trained or weakens if the muscle is not used, the muscle shortens if it remains contracted for a longer period of time. When the muscles are shortened, they have a negative effect on the body posture, thus causing the increasingly common problems in the lower back. When a muscle is not used as extensively as it should, the muscle becomes shorter at the same time as the ability to use the total capacity and motion course of the muscle are reduced.

[0003] When muscles are shortened the balance between such muscles and their respective antagonists is changed. The function of a contracted muscle is inferior, especially when subjected to heavy load, which means that the muscular strength deteriorates and that what are known as the more rigid parts of the movement apparatus, muscular attachments, cruciate ligaments and parts in connection with joints are subjected to a heavier load and the risk for injury increases.

[0004] It is important to note that in addition to inactivity the problem with contracted and rigid muscles arise to a great extent when individual parts

of the movement apparatus are fixed or trained harder in proportion to the rest of the co-operating muscle groups or the antagonists thereof. When a muscle becomes stronger and the antagonist thereof is not able to provide the same resistance, the result is that the stronger muscle on one side of the joint is tightened and the weaker muscle on the other side of the joint yields. What becomes a problem is that the muscle balance when co-operating does not function properly, instead for instance the body posture becomes incorrect and the shortened muscle is not capable of carrying out the conventional length of the movement in full. The contracted muscle is a contributing factor when both active and latent muscular and joint pain is developed in the contracted muscle and as a result pain in other muscles and joints. Statically strained muscles also cause headache, hip and back trouble.

[0005] In order to reduce the load on the muscles and the skeleton when exercising so as to for instance be able to employ a greater weight during a weight training movement, different support devices can be used to support the body. Such solutions are shown for instance in patent publications GB 2,409,177, US 4,621,809 or US 4,953,857. The other muscles that function in the same group and that are supported by a fixation of the body or parts thereof in similar support devices, are as a result of the support made weaker in proportion to the one that is being trained. The fixation of the body in such support devices thus cause the above problems.

[0006] In many types of training, for instance running but also other one-sided movements, it is not made possible for the muscles to function in the full movement thereof. What occurs during such type of training is that some muscles become overloaded and the training also causes the formation of waste products, such as lactic acid, in the muscles.

[0007] A well known method to improve the flexibility of the muscles, take care of waste products in the muscles, reduce the pain caused by the contracted and rigid muscles and to regain the muscle balance is to stretch the muscles in order to improve the elasticity, length and function of the muscles.

[0008] It is also important to distinguish between training and stretching. A common denominator for physical training, such as weight training, sit-ups, yoga, Pilates, is to activate and strain a muscle with or without resistance. For instance during a training movement, a muscle is contracted so as to provide a movement in the joint of the practiser, thus creating a physical

exercise. Types of training also exist, where no actual physical exercises are performed, instead only a muscle is strained. When exercising the movements are mainly carried out by several simultaneously co-operating muscles. A muscle that is trained responds with growth and increased endurance.

[0009] However, what occurs during stretching is that a muscle or a muscle group is systematically stretched. Here, the contracted muscles are stretched and regain the normal length thereof so as to also affect the body posture and body movements. The main idea of stretching is to relax a muscle and to stretch the muscle through a movement in order to gain a normally functioning movement in the muscle. In contrast to training, where the muscle is activated, the muscle has to be completely relaxed (deactivated) when stretching in order to be able to stretch out the muscle. A strained muscle cannot be stretched out as it is contracted when it is strained. The aim of stretching is to obtain an extremely small movement in the joint and a maximum stretch in the muscle itself. The movement is to be performed so as to carry out the movement in the muscle when it yields.

[0010] What can be achieved during stretching is a muscle balance between the muscle antagonists and the muscles, which are activated together in a natural movement. However, stretching is not always exclusively for good. If an incorrect stretching technique is employed or if the muscle to be stretched is strained during stretching, the movement can be performed in a joint or in a less advantageous place. The positive result then fails to appear and the movement may in the worst case cause harm. In order to avoid and prevent the muscular problems, which are a result of the current lifestyle, a correctly performed stretching may be of great help for reducing ill-health and improving well-being. Since an incorrectly performed stretching may result in difficult injuries, it is therefore of great importance that the stretching can be carried out in controlled movements and in correct conditions. Unfortunately stretching is to a great extent carried out without any auxiliary means or using auxiliary means that do not in any way assist in finding the correct starting position when stretching. It is not either easy to find auxiliary means that could support the stretching movement in order to preserve the optimal direction of movement or should assist in anatomically improving the chance to stretch the muscle. The movements are often carried out for instance by means of plane floor or table surfaces.

[0011] Auxiliary means are known in particular from patent publications GB 2,400,329 or US 5,662,592, which are meant to be utilized for stretching thigh muscles. However, these known auxiliary means lack means that could make sure that the stretching movement is carried out anatomically in an optimal manner. The use of such auxiliary means often results in the fact that for instance pressure points are created in the muscles, and that the muscles to be stretched are strained, that the joints are stressed and that the movement is performed in an incorrect place, for instance in a knee joint or in the lower back. The pressure points are created owing to the fact that a part of the body is placed under great pressure such that the body defends itself or that the blood circulation is prevented. Pressure points may be created in a joint, knee or ankle, or in a muscle when sitting down or when a greater pressure is placed on one spot when supporting oneself on the auxiliary means. This results in turn in that the defence mechanism of the body is therefore activated in order to protect the muscles, which makes stretching more difficult. The result is often an inefficiently performed movement, where the stretching itself is insignificant. Such deficiencies are the cause of for instance an inefficient stretching of the muscle and the previously mentioned problems concerning muscle and joint injuries are created. In the worst case, such injuries may last for a long time and cause a lot of trouble.

BRIEF DESCRIPTION OF THE INVENTION

[0012] The present invention substantially allows avoiding the problems associated with known solutions and the stretching of the muscle may be rendered substantially more effective. It is therefore the object of the invention to provide an easily usable stretching of the muscle, which is easy, functional and safe to carry out with the present apparatus.

[0013] This object is achieved in accordance with the invention by providing the stretching apparatus of the invention with the characteristics indicated in claim 1. The following dependent claims provide appropriate further developments and respective variants of the invention that further improve the function thereof.

[0014] The invention is based on the idea that in a stretching movement the joints of the muscle concerned are fixed such that the movement is performed in the muscle. In addition, what is known as the user's movement apparatus is placed in such a position that the muscle remains in a

relaxed position, where it is extended, co-operating muscles are not allowed to prevent the relaxation of the muscle that is to be stretched, and therefore the muscle may easily be stretched out.

[0015] The present invention allows providing a stretching apparatus, which owing to the design, height, inclination as well as built-in support points and damping allows making it easier to carry out an anatomically correct stretching movement by fixing the user's joint or joints while stretching. The present stretching apparatuses are particularly suitable to be used for treating the muscular problem areas, which are the result of today's lifestyle that includes a lot of sitting and monotonous movements at work and during training, which cause muscle contraction and overloading.

[0016] In this description the terms "stretch" and "extend" and similar terms are used synonymously to refer to stretching one or more muscles in a human body.

[0017] The term "movement apparatus" refers to the skeleton, joints and skeleton muscles that together provide a prerequisite to move the body or the parts thereof.

[0018] In the following description the terms "above", "below", "outside of" and so forth refer to directions in relation to the stretching apparatus or to the structural details thereof, such as those shown in the accompanying figures.

[0019] Several considerable advantages are achieved with the apparatus described in the present invention over the prior art. Thus, the stretching apparatus is arranged to provide an optimal stretching of a particular muscle or muscle group. Stretching with the present apparatus provides an extremely small movement in the user's joints, while a maximum muscle stretching is achieved.

[0020] A stretching apparatus according to the invention is constructed in order to maintain the joint or joints concerned in the user's movement apparatus in a correct position, and at the same time relieve the pressure on the joint as much as possible while the muscle or muscle group concerned is inactivated when performing the stretching movement. The present apparatus also allows avoiding the activation of muscles and joints co-operating with those that are to be stretched. Consequently these are unable to avoid a maximal stretching in the muscle that is thought to be stretched. The padded parts included in the apparatus support the body part around the muscle and

the muscle to be stretched in the correct starting and movement position so as to stretch the correct muscle and to preserve the correct anatomic form of the movement apparatus.

[0021] Owing to the lack of moving and/or rotating functions while in motion the present apparatuses are reliable and easy to use for each and everyone that needs to stretch their muscles. Since the apparatus takes up a substantially static position when used, the movement apparatus is placed in a position that provides a better prerequisite for stretching the muscle in question.

[0022] The padded parts mentioned above also form support points, which isolate the muscle or the muscle group during the stretching movement. The padded parts support together with the frame the movement apparatus and thus release the current muscle or muscle group. Such a support allows avoiding the creation of excess mobility in the movement apparatus while stretching. In this context release refers to the inactivation of a muscle or muscle group.

[0023] The damping characteristics of the padded part also allow the formation of annoying pressure points to be eliminated in joints and muscles, in which case stretching becomes considerably easier.

[0024] What is also avoided in an apparatus according to the present structure is to prevent the blood circulation to the stretched muscle or the closely related muscle (muscles).

[0025] A stretching apparatus according to the present invention may also be easily adapted to users of different body structure, since the apparatus may if necessary be shifted vertically, but also slanted in relation to the base.

[0026] The invention makes it easier for the user to employ the correct inward curve in the lower back, or if necessary, avoid an inward curve in order to achieve the anatomically correct movement in all movements.

[0027] Owing to the proper relaxation that is provided in the muscle or muscle group concerned, while stretching using the present apparatus, it is possible to stretch the muscle or the muscle group more extensively than with other known auxiliary means.

[0028] Further advantages and details of the invention will be described in more detail in the description below.

DESCRIPTION OF THE DRAWINGS

[0029] In the following the invention will be described in greater detail with reference to the drawing, in which

Figure 1 shows a front view of a first embodiment of a stretching apparatus,

Figure 2 shows a side view partly in cross-section of the apparatus according to Figure 1,

Figure 3 shows a top view of the apparatus according to Figure 1,

Figure 4 shows a front view of a second embodiment of a stretching apparatus,

Figure 5 shows a side view of the apparatus according to Figure 4,

Figure 6 shows a top view of the apparatus according to Figure 4,

Figure 7 shows a rear view of a third embodiment of a stretching apparatus,

Figure 8 shows a side view of the apparatus according to Figure 7,

Figure 9 shows a top view of the apparatus according to Figure 7,

Figure 10 shows a front view of a fourth embodiment of a stretching apparatus,

Figure 11 shows a side view of the apparatus according to Figure 10,

Figure 12 shows a top view of the apparatus according to Figure 10,

Figure 13 shows a front view of a fifth embodiment of a stretching apparatus,

Figure 14 shows a side view of the apparatus according to Figure 13,

Figure 15 shows a top view of the apparatus according to Figure 13,

Figure 16 shows a front view of a sixth embodiment of a stretching apparatus,

Figure 17 shows a side view of the apparatus according to Figure 16, and

Figure 18 shows a top view of the apparatus according to Figure 16.

PREFERRED EMBODIMENTS

[0030] Some of the most preferred embodiments of a stretching apparatus are described in the following with reference to the above figures. Thus, the solution comprises the structural parts shown in the figures, each

one of which being provided with respective reference numerals. The reference numerals correspond with the reference numerals indicated in the description below.

[0031] A stretching apparatus according to the present structure comprises in accordance with the figures a frame 1 preferably made of bent or welded aluminium or steel tubes. The frame comprises at least a bench 2 arranged thereto above the stationary base. The frame extends to the base, for instance a floor surface, such that it confronts the base on the outside of the projection surface on the base. This allows loading the bench with a user's body weight without the risk of overturning the stretching apparatus.

[0032] The bench 2 is together with the frame 1 arranged to accept and support one or more parts of the user's movement apparatus. On account of the design of the bench and the frame an apparatus has been achieved for releasing a muscle or a muscle group that is to be stretched so as to facilitate and provide means for performing an anatomically correct stretching movement. In this context the release means that the muscle or muscle group should remain inactive while performing the stretching movement.

[0033] In order to achieve this object, an upper surface included in the bench is provided with what is referred to as a support surface 3. The support surface is designed to be smooth or damped and to include indentations 4 and/or projections 5 that together with the frame 1 enable to inactivate the muscle or muscle group concerned, which is a prerequisite for the stretching to become effective and safe.

[0034] The support surface 3 is preferably padded and may together with the bench 2 be completely integrated with the frame 1. The support surface may also be composed of one or more replaceable parts that can be detached from the bench, which can be detached and replaced for instance owing to wear. As regards structure, the padded part may for instance be form sewn and filled with appropriate elastic and damping material. The part may also be form-cast of an appropriate material in order to be covered with a surface material suitable for the purpose, or completely cast with a surface material.

[0035] The indentations 4 and/or projections 5 of the support surface 3 form support points therein, which place the user's movement apparatus in a predetermined state in relation to the rest of the movement apparatus. Such support points together with the frame 1 thus isolate and release the

muscle or the muscle group that is to be stretched and prevent the muscle or muscle group from being activated during stretching. This combined with the damping properties of the padded part provides a pleasant stretching and eliminates the formation of annoying pressure points in the muscles concerned, or that the joints in question are not stressed by the stretching or that the movement is performed in an incorrect place.

[0036] Figures 1 to 3 show a stretching apparatus comprising a bench 2 of elongated and inclined design provided with a support surface 3. The bench is supported on the base through a frame 1, which extends approximately 400 to 600 mm above the base. The support surface is provided with a ridge-like first projection 5. The projection is arranged substantially in the middle of the support surface and is orientated in a direction substantially perpendicular to a longitudinal axis 6 on the support surface. The projection is arranged to support a leg placed on the bench under the knee joints, whereby the projection prevents excess stretching of the knee joints during stretching when the leg is placed on the bench, which could cause stress to the knee joints. The projection also operates as a support to the movement apparatus when the leg is pressed against the support surface. If the joints are subjected to stress the result is typically that the muscle is strained and an effective stretching of the muscle is prevented. The projection is therefore provided with a shape that substantially corresponds with the same anatomic form that the movement apparatus has under the knee joints.

[0037] The above mentioned support surface 3 also comprises a ridge-like second projection 7, which is substantially arranged at the short side 8 of the support surface. This projection is also orientated in the direction substantially perpendicular to the longitudinal axis 6 on the support surface. When stretching the leg, the ankle is placed on the projection so as to rest thereon between the end of the calf muscle and the tarsal joint, while the foot may be extended outside the bench, whereby the movement apparatus is supported between the heel and what is known as the upper calf muscle (Gastrocnemius). The surface orientated against the foot in the second projection is provided with a greater inclination in relation to the longitudinal axis than the opposite surface orientated against the knee joints. The protrusion operates as a support for the movement apparatus when the leg is pressed against the support surface and prevents pressure points from being formed in the calf muscle when it is placed against the support surface. Since the heel lacks support the

calf muscle of the leg is not activated, and can therefore not have a negative effect on the stretching movement.

[0038] It is also possible, but not necessary, to further form projections substantially in parallel at edge sections 9 and 10 at the long sides of the support surface and to connect the ridge-like first and second projections 5 and 7. An indentation 4 is thus obtained between them, which allows supporting the calf in the longitudinal direction thereof during the stretching movement.

[0039] The damping shape of the support surface 3 allows avoiding pressure points in the calf as well as in the buttock, the ischial bone in the pelvis, the hip joint and on the back side of the thigh.

[0040] The top side of the bench is arranged to be somewhat slanted in relation to the base, and at the same time the long sides thereof are connected to a rounded upper short side 11 at the end orientated opposite to the second projection. The fact that the padded part is ended with a rounding and lacks support for the foot means that the muscles at the back of the thigh or the calf muscle are not connected when supporting the foot. The inclination makes the stretching easier to perform and more efficient as it provides the leg with the correct position in the apparatus, while the rounding facilitates the maneuvering of the leg that is not placed on the bench. The inclination of the support surface of the bench is preferably arranged to be provided by shaping the frame 1. The support surface will hereby show a height above the base that preferably is approximately 40 to 60 cm. By seeking support with the other leg outside the padded part with the foot on the base, the user may now curve his/her lower back inward and be provided with a correct posture in the lower back and in the hips. This provides a better effect and a more correctly performed stretching.

[0041] The apparatus described thus allows stretching hamstring muscles of the user's movement apparatus. By placing the ankle on the second projection 7, the ham of the knee on the first projection 5, and allowing the projections at the edge portions 9 and 10 to support the calf in the longitudinal direction thereof and allowing the upper thigh to be placed on the upper half of the support surface 3 prevent excess stretching of the knee joints and an incorrect loading of the back.

[0042] The hamstring muscles are fastened to the ischial bone, in which case one must curve the lower back inward in order for the hip and the ischial bone to stretch the muscle in the longitudinal direction thereof. If inward

curving of the lower back is impossible then the muscle is in a contracted position. Stretching the muscle takes place at the same time as the upper body is bent forward towards the foot, maintaining the inward curve in the lower back.

[0043] Figures 4 to 6 show a stretching apparatus with a bench 2, which shows a preferably two-part elongated upper surface arranged above the base with the frame 1. In this embodiment a first part 12 of the support surface 3 orientated against the user's body part is provided with substantially parallel projections 13 and 14 at the long sides thereof surrounding an indentation with a substantially straight bottom in order to support the lower leg. Such a design allows avoiding the formation of pressure points in the muscles at the front side of the lower leg and the disturbance of the blood circulation. The side supports are preferably provided with a substantially similar anatomic inclination as the calf. This contributes to the fact that the calf muscles are not strained when carrying out stretching. The first part 12 of the support surface ends before the kneecap so as not to create pressure points or to injure the parts of the knee joint. In the opposite end thereof the support surface ends before the joint in the ankle so that the foot cannot be strained in the apparatus.

[0044] The first part 12 co-operates with a second part 15 comprising a bowl-shaped indentation 4 orientated against the user's movement apparatus. This second part comprises protrusions at the side supporting the movement apparatus such that it is possible to maintain the balance in the starting position but also offer help for supporting the movement apparatus when performing the stretching movement. In a vertical cross-section according to Figure 5 the support surface is provided with a form that supports the movement apparatus above the knee cap with a rounding. Consequently no pressure points are formed here either nor can for instance the kneecaps or other joint parts be injured. Above the rounding a line adaptive to the leg follows as a support for the thigh, which will rest at a 90° angle in relation to the lower leg. Also the upper part of the support surface shows a rounded shape so as not to form pressure points in the muscles, where they are most supported against the apparatus.

[0045] The first and second part of the support surface are according to the above arranged at an angle in relation to one another such that the parts 12 and 15 of the support surface occupy in addition to an angle in relation to one another that is of the magnitude 90° an angle in respect of the hori-

zontal plane. In such a structure the respective parts are arranged in a substantially rigid relation in respect of one another with the frame 1. The frame further shows a height so that the movement apparatus is maintained straight in the hip and back joints. By supporting the front side of the user's lower leg in the indentation 4 in the first part 12 of the support surface and the lower part of the thigh in the indentation 4 in the second part 15 of the support surface the load is reduced from the knee joints between them during stretching. By maintaining the angle of the knee joints in the stretching apparatus described continuously at substantially 90°, it is possible to stretch muscle groups on the front side of the thigh and the muscles at the groin or at the front side of the thigh, including what are known as the hip flexors, without performing the movement in the knee joints or in the lower back. The first part 12 also prevents the lower leg from sliding sideways and thus provides support during the stretching movement. Since the apparatus releases the foot during stretching the reactions in the foot cannot resist the stretching movement.

[0046] The adaptive design of the support surface 3 provides a sufficient amount of resistance and supports lower legs and knee joints when stretching without impeding the blood circulation or stressing the joints, while supporting oneself with the free leg in front of the apparatus. The use of the apparatus is further facilitated by arranging the bench above the base, preferably at a height of approximately 20 cm, something that allows maintaining the hip and the lower back straight during stretching.

[0047] Thus, the apparatus described allows stretching the muscle groups on the front side of the thigh and the muscles at the groin, the front side of the hip and what are known as the hip flexor muscles. The movement is carried out by standing with one foot on the base in front of the stretching apparatus and with the other foot that is to be stretched resting on the apparatus. A straight line is maintained in the upper body, while bending slightly forward. The movement is then performed in the upper part of the front side of the thigh, the hip flexors and the muscles at the groin and the front side of the hip.

[0048] An embodiment according to Figures 7 to 9 shows a stretching apparatus for stretching muscles and muscle groups at the sides of the hips, gluteal muscles, also deep transverse and adjacent muscles fastened to the sacral bone, the caudal vertebra and to the hip bone and the thigh-bone. For this purpose the upper surface of the bench 2 resting on the frame 1 shows an elongated shape, where the support surface 3 orientated against the

user's movement apparatus comprises substantially parallel projections 17 and 18 at the long sides thereof for forming an indentation 4 between them.

[0049] The indentation that lies in the substantially horizontal plane is at the same height as the muscles are from the joints in depth. The structure assists the joint from being stressed and that pressure points are not formed in the calf muscle or in the thigh that is supported on the padded part. The inclination of the projections 17 and 18 preferably show the substantially same anatomic inclination as the muscles in the calf. The projection 17 orientated towards the user is provided with a height difference from the bottom of the indentation 4 that allows the thighs or the movement apparatus to be supported on the support surface and to avoid a load on the knee joints. The opposite projection 18 is provided with substantially the same height, but for supporting the lower leg and the hands of the movement apparatus such that the user is able to avoid instability.

[0050] In order to be able to stretch the above muscles or muscle groups optimally, the support surface 3 of the bench should be placed in a substantially horizontal position and substantially at the same height with the user's crutch. The support surface 3 is substantially horizontal in order for the calf to be inclined 90° in relation to the centre line of the movement apparatus. The inclination is preferably adjustable in order to provide the thigh with a 90° angle in relation to the centre line of the body seen from the side. The frame 1 is also constructed such that the bench may preferably be moved in the vertical direction.

[0051] The indentations 4 of the support surface are aimed to provide the user's calf with maximal support in the direction parallel to the pelvis and to maintain the knee joints at a correct 90° angle as well as the thigh-bone at a correct 90° angle in relation to the pelvis. It is possible to advantageously support the hands on the padded part in order to maintain the upper body straight, an inward curve in the lower back is necessary in order for the stretching to be advantageous. The bench 2 simultaneously makes stretching easier by maintaining the position of the pelvis in relation to the thigh, the calf and the lower back. The damping form of the support surface further allows avoiding pressure points in ankles and knees.

[0052] The apparatus described is used to stretch muscle groups by having one leg placed on the stretching apparatus so that the muscles are released when they are supported on the support surface 3. Depending on which

muscle is desired to be stretched the angle of the leg or knee joint may be varied. The other leg is also supported on the base. The movement is performed so as to bend the upper body forward by maintaining the inward curve of the back.

[0053] Figures 10 to 12 show a stretching apparatus with a bench 2 comprising a support surface 3 that includes a ridge-like projection 19 arranged substantially in the middle of the support surface. The frame 1 is used to arrange an appropriate sitting height for the support surface, where the feet support the movement apparatus on the base. The projection orientated against the user's seat centers the body on the bench 2 and facilitates the inclination of the body sideways during the movement. Handles 20 are arranged so as to project beyond the respective long sides of the bench. The handles are fastened substantially rigidly to the frame 1 and enable to effectively stretch the upper part of the trapezius muscle, the front side of the upper arm and parts of the nape and the neck. The movement is performed by using one hand for holding on to the handle and trying to lift the shoulder upwards and then to lean the upper body to the corresponding side. The movement is then performed in the above muscles. Hands may be shifted for stretching the other side. When the left hand is used for holding on to the handle and stretching is carried out to the right side, then the left side is stretched. The handles are preferably arranged to the frame behind a centre line of a user's upper body. Preferably each side of the bench is provided with two different handles that suit the mobility of different users and the arm's length of such a user. The damping support surface prevents the pressure points from being formed in the ischial bone on the pelvis during stretching.

[0054] The side view of the bench shows an indentation 4 formed such that no pressure points will be formed in the muscles surrounding the ischial bones of the movement apparatus when one is sitting down. The bench also comprises a projection at the rear edge thereof in order to follow the seat so that an inward curve in the lower back is made easier and so that one is not seated too far back.

[0055] An embodiment according to Figures 13 to 15 show a stretching apparatus for stretching the middle part of the trapezius muscles as well as the muscles that are fastened to the shoulder blades. Such an apparatus comprises a bench 2 arranged above the base with the frame 1. The upper surface of the bench shows a two-part support surface 3 having a substantially

elongated shape. The respective parts in such a two-part support surface are arranged in a substantially rigid relation regarding one another with the frame 1. Thus, the first part 21 of the support surface 3 comprises substantially parallel projections 22 and 23 at the long sides thereof that delimit a projection orientated against the user's knee and lower leg.

[0056] The second part 24 of the support surface is located slightly above the first part and is arranged to receive the user's lower arm or hand. The second part comprises preferably a substantially plane surface on which the upper body is supported. The second part may also be made vertically displaceable in relation to the first part. The damping form of the support part allows avoiding the pressure points in both knee joints and hand joints. In a preferred embodiment the second part is provided with a rounded form, the shape substantially resembling the anatomic form of the palm of the hand. The width of this part is such that the user may place his/her thumb so as to extend around the outer edge of the part and place the centre part of the hand in the middle of the support surface.

[0057] The parts of the support surface are provided with an angle relative to the horizontal plane such that both parts 21 and 24 are provided with substantially corresponding angles.

[0058] The apparatus also comprises handles 25 below the first part 21 of the support surface, whereby the handles are fastened substantially rigidly to the frame 1. The distance between the first part 21 of the support surface and the handles is approximately 100 to 200 mm. The handle is also approximately 100 to 200 mm below the first part of the support surface in line in order to be able to stretch the muscle and to maintain the back straight seen from the right to the left shoulder.

[0059] The second part 24 of the support surface is in turn fastened on the frame 100 to 200 mm in front of the handles, which is fastened to the frame. The stretching apparatus according to Figures 13 to 15 is used in such a manner that one, for instance the left, lower leg is placed on the support pad 21 and the right foot is supported against the base adjacent to the apparatus. The right arm is placed on the support pad 24 while the left hand is used to take hold of the handle on the right side of the frame 1. The movement is performed by pressing the upper side of the back upwards using the right arm and the left knee, the left arm providing resistance and the movement is performed

in the left side muscles mentioned above. A corresponding starting position is taken to achieve a stretching on the right side.

[0060] Figures 16 to 18 show a stretching apparatus for stretching the deep square muscles in the lower back and the outer sides of the thighs and hips. The apparatus comprises a bench 2 provided with a two-part support surface 3 with an elongated shape carried on a frame 1. The frame lifts the bench approximately 100 mm from the base so that the foot will not touch the floor and be strained or stress the joints. The structure also allows the user to maintain his/her body at a straight line seen from the side when the user puts his/her other foot on the base in front of the body at knee-height with the leg the user is stretching. The support surface is slightly inclined such that stretching in the present apparatus will not load the lower back or the hips excessively.

[0061] The first part 26 of the support surface orientated against the user's body part comprises substantially parallel projections at the long sides 5 thereof. The inclination on the projections correspond substantially to the anatomic shape of the muscle surrounding the thigh-bone. Thus, the pressure points in the muscles are avoided, while the muscles may be relaxed during stretching. The movement apparatus may even more easily be maintained in a straight line, seen from the side of the body, both in the starting position but also during the movement. The second part 27 of the support surface orientated against the user's body part comprises substantially parallel projections 28 and 29 at the long sides thereof in order to form an indentation 4 between them, which is substantially perpendicular to the projection formed between the projections 5 in the first part of the support surface. The second part 27 of the support surface will be resting approximately 300 to 500 mm above the first part 26 in order for the user to be able to provide support with the lower arm of movement apparatus when performing the stretching movement.

[0062] Both parts of the support surface are provided with an angle in relation to the horizontal plane that deviates from one another.

[0063] What is provided through the projections in the support surface 3 in the first part 26 is a straight line in the body during stretching that is necessary for achieving a stretch in the muscle. A support is provided through the second part 27 so that the upper body can be held up and allow the stretch even though the arm muscles were not well developed. Here, the damping of the support surface avoids the formation of pressure points in the ankle, knee

joint or hand joint. The starting point is for instance to place the right leg on the padded part 26 while the left foot is supported on the base in front of the right knee joint. The upper body is supported by placing the right lower arm on the padded part 4. The movement is performed by lowering the hip downwards and maintaining a straight line in the body. The movement is then performed in the muscles mentioned above.

[0064] The apparatuses described above are intended to be used in different combinations depending on what kind of effect is aimed. A single apparatus is rarely used exclusively, instead 2 to 4 apparatuses are often combined depending on which problems are to be treated. A runner preferably uses apparatuses according to Figures 1 to 9 and 16 to 18, a person who is sitting down most of the day utilizes apparatuses according to Figures 1 to 6 and a person who is standing most of the day is likely to employ apparatuses according to Figures 7 to 9 and 16 to 18.

[0065] The specification above and the figures associated therewith are merely intended to illustrate the present solution to a stretching apparatus structure. The solution is therefore not restricted only to the above or the embodiments described in the accompanying claims, but various variations or alternative embodiments are possible within the scope of the idea described in the accompanying claims.

CLAIMS

1. A method for stretching a muscle or a muscle group in a user's movement apparatus, **characterized** in that

the user arranges a part of his/her movement apparatus to a stretching apparatus, in which the movement apparatus in the part concerned is supported on the stretching apparatus, whereby

an inactivity of the muscle or muscle group that is to be stretched is encouraged by

supporting at least one joint in at least one end of the muscle or muscle group in a substantially fixed relation above the stationary base of the stretching apparatus and in a substantially fixed relation to the rest of the movement apparatus.

2. A method as claimed in claim 1, **characterized** in that the stretching apparatus forms one or more support points for fixing the joint and thus inactivating muscles or muscle groups, which are to be stretched, while a stretching movement is carried out.

3. A stretching apparatus for stretching a muscle or a muscle group, the apparatus comprising a frame (1) and at least a bench (2) arranged thereto, **characterized** in that

the bench (2) is with the frame (1) arranged to rest above the base of the stretching apparatus in a relation fixed thereto,

the bench is arranged to comprise a support surface (3) for receiving a part of the user's movement apparatus, whereby

the support surface comprises indentations (4) and/or projections (5) arranged in such a manner on the support surface that they form at least one support point for at least one joint in the movement apparatus arranged on the stretching apparatus, for

fixing the joint in relation to the rest of the movement apparatus.

4. A stretching apparatus as claimed in claim 3, **characterized** in that the support surface (3) of the bench is formed of at least a padded part arranged on the bench (2).

5. A stretching apparatus as claimed in claim 4, **characterized** in that the padded part is formed of a damping material.

6. A stretching apparatus as claimed in claim 4 or 5, **characterized** in that the bench (2) and the padded part included therein form an

integrated part of the frame (1).

7. A stretching apparatus as claimed in claim 4 or 5, **characterized** in that the padded part forms a part that is detachable and replaceable from the bench (2).

8. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the upper surface of the bench (2) has an elongated form with a lower short side (8) and an upper short side (11), which connect the long sides thereof, whereby the support surface (3) orientated against the user's movement apparatus

comprises a ridge-like first projection (5) arranged substantially in the middle of the support surface in a direction of the longitudinal axis (6) therein, the first projection being orientated in a direction substantially perpendicular to the longitudinal axis,

further comprises a ridge-like second projection (7) arranged substantially at the lower short side (8) of the support surface, the second projection being orientated in a direction substantially perpendicular to the longitudinal axis of the support surface,

whereby the support surface is substantially plane between the first projection and the upper short side and

is provided with an inclination in relation to the horizontal plane.

9. A stretching apparatus as claimed in claim 8, **characterized** in that the support surface (3) comprises substantially parallel projections (9, 10) at the long sides thereof, the projections connecting the ridge-like first and second projections (5, 7) together in order to form an indentation (4) between them.

10. A stretching apparatus as claimed in claim 8 or 9, **characterized** in that the upper short side (11) is rounded.

11. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the support surface (3) of the bench (2)

shows a two-part elongated form such that

the first part (12) of the support surface orientated against the user's movement apparatus comprises substantially parallel projections (13, 14) at the long sides thereof, the projections delimiting an indentation that is provided with an angle against the horizontal plane,

while the second part (15) of the support surface orientated against the user's movement apparatus is provided with a bowl-shaped indentation (4),

whereby

the indentations in the first and second part of the support surface is arranged at an angle towards one another.

12. A stretching apparatus as claimed in claim 11, **characterized** in that the angle between the indentations in the first and second part (12, 15) of the support surface (3) is approximately 90°.

13. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the support surface (3) of the bench (2) shows an elongated form arranged substantially in the horizontal plane such that

the support surface orientated against the user's movement apparatus comprises substantially parallel projections (17, 18) at the long sides thereof for forming an indentation (4) between them.

14. A stretching apparatus as claimed in claim 13, **characterized** in that the bench (2) is vertically displaceable.

15. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the upper surface of the bench (2) comprises a support surface (3) orientated against the user's movement apparatus, comprising

a ridge-like projection (19) arranged substantially in the middle of the support surface,

handles (20) arranged below the bench so as to project outside the respective long sides of the bench, whereby the handles are fastened substantially rigidly to the frame (1).

16. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the support surface (3) of the bench (2)

shows a two-part elongated form such that

the first part (21) of the support surface orientated against the user's movement apparatus comprises substantially parallel projections (22, 23) at the long sides thereof, the projections delimiting an indentation that is provided with an angle against the horizontal plane, while

the second part (24) of the support surface orientated against the user's movement apparatus is arranged to vertically rest above the first part and is provided with an angle against the horizontal plane substantially corresponding to the angle of the first part.

17. A stretching apparatus as claimed in claim 16, **character-**

ized in that the stretching apparatus comprises handles (25) below the first part (21) of the support surface (3), whereby the handles are fastened substantially rigidly to the frame (1).

18. A stretching apparatus as claimed in any one of claims 3 to 7, **characterized** in that the support surface (3) of the bench (2)

shows a two-part elongated form such that

the first part (26) of the support surface orientated against the user's movement apparatus comprises substantially parallel projections (5) at the long sides thereof, the projections delimiting an indentation that is provided with an angle against the horizontal plane, and

the second part (27) of the support surface orientated against the user's movement apparatus also comprises substantially parallel projections (28, 29) at the long sides thereof for forming an indentation between them, the indentation being substantially perpendicular to the indentation (4) formed in the first part (26) of the support surface, whereby

the parts of the support surface are provided with an angle against the horizontal plane that differs from one another.

19. A stretching apparatus as claimed in claim 18, **characterized** in that the second part (27) of the support surface (3) is arranged to rest above the first part (26) of the support surface.

20. A stretching apparatus as claimed in claim 18 or 19, **characterized** in that the second part (27) of the support surface (3) is vertically displaceable.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI2006/050376

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A63B, A61H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5205804 A (H.V. HALL), 27 April 1993 (27.04.1993), whole document --	1-20
X	US 5106083 A (H.V. HALL), 21 April 1992 (21.04.1992), whole document --	1-20
X	US 4583533 A (P.H. GOODLEY ET AL), 22 April 1986 (22.04.1986), whole document --	1-20
X	US 4559930 A (J.F. COBISKI), 24 December 1985 (24.12.1985), whole document --	1-20

 Further documents are listed in the continuation of Box C. See patent family annex.

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International application No.

PCT/FI2006/050376

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6666801 B1 (A. MICHALOW), 23 December 2003 (23.12.2003), whole document --	1-20
X	US 5348523 A (G.M. BLOUNT), 20 Sept 1994 (20.09.1994), whole document --	1-20
X	DE 3208298 A1 (PERLEBERG-KÖLBEL, RENATE-GUNHILDE), 22 Sept 1983 (22.09.1983), whole document -- -----	1-20

International patent classification (IPC)**A63B 21/078** (2006.01)**A61H 1/02** (2006.01)**A63B 23/00** (2006.01)**Download your patent documents at www.prv.se**

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Cited literature, if any, will be enclosed in paper form.

INTERNATIONAL SEARCH REPORT
Information on patent family members

01/11/2006

International application No.
PCT/FI2006/050376

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US	4583533	A	22/04/1986	NONE		
US	4559930	A	24/12/1985	NONE		
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US	5348523	A	20/09/1994	NONE		
DE	3208298	A1	22/09/1983	NONE		