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Amended claims in accordance with Rule 137(2) EPC.

(54) **TRAINING PANTS**

(57) The present invention aims to provide training pants to overload the user's leg with resistances and as a result increase their muscular force, thereby strengthening the user's legs, particularly designed for practicing taekwondo or karate, and consist of a belt (11) and heel supports (40) that are adjustable in order to tighten resistance bands (21, 22, 21', 22') that can be joined to the belt (11) at the upper end thereof and to the heel supports (40) at the lower end thereof, characterized in that they have kneepads (30, 30') with loops through which the resistance bands (21, 22, 21', 22') pass that create tension in the flexion angle on the rear part of the knees. The belt (11) defines a surface that is adjustable to the user and has at least a snap-type buckle (12) and it includes a series of ring-shaped holes that are reinforced on the outer edge thereof (12, 13, 12', 13').

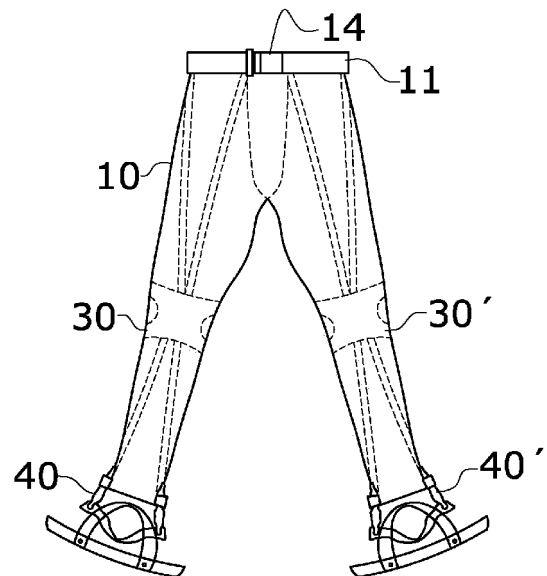


FIG.1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to training pants, particularly to pants that incorporate elastic bands of varying degrees of resistance, which allow the user to perform a series of exercises with an increase in the load on the legs of users. Likewise, the training pants allow the user to do a series of exercises, avoiding the distortion of the user's natural center of gravity or of their movement patterns.

[0002] The training pants consist of a belt and heel supports which are adjustable in order to tighten the resistance bands and are characterized in that they have kneepads in which 4 loops are integrated, each one placed on each of the upper and lower ends of the rear part of the kneepad, allowing a flexion angle to be formed on the rear part of the kneepads and providing resistance when the user exercises their legs.

BACKGROUND OF THE INVENTION

[0003] There are several different types of apparatuses for exercise and systems that enable an increase in the resistance on the legs of a user, specifically "leg harness" types of apparatuses of variable resistance, which are known because the load on the user's legs is increased, but said apparatuses have not been satisfactorily tested for training in sports that require constant use of one's legs, such as taekwondo or karate.

[0004] Examples of said apparatuses can be found in the US industrial design DES. 385,385 which, in the design and graphic representation thereof, shows a set of bands incorporated into a pair of pants, wherein the bands are incorporated into the fabric of the pants. However, although said industrial design adjusts to the legs of the user, said adjustment of the bands on the legs is dependent on the tension exerted by the bands that continue on the user's torso and, therefore, to obtain tension on the lower extremities (the part of the bands incorporated into the pants), it is necessary for there to be tension on the upper part of the user's body.

[0005] On the other hand, United States patent US 5203754 describes a variable resistance leg harness exercise apparatus that enables the user to perform a series of exercise cycles under an increased load by means of resistance, increasing the load on the user's legs in order to increase muscular strength and endurance of the legs. Said apparatus includes a belt, leg accessories, stretchable cords for the belt and foot accessories in order to provide an increased in resistance and without distorting the natural exercise patterns.

[0006] However, it has a disadvantage in that the bands do not integrally adjust to the user's legs, distorting the user's natural center of gravity due to the position of the bands. Therefore, this apparatus does not provide the necessary tension for exercising the legs in exercises

such as those required for the practice of taekwondo or karate.

[0007] Likewise, United States patent US 6179760 B1 describes an apparatus to assist the leg muscles during cycling. Said patent has technical elements that help the user's legs stretch during an upstroke and help the legs contract on a downstroke to release the energy for assisting the legs to rotate the pedals.

[0008] Said device is used to increase the performance of a cyclist during bicycling or other cycling by increasing the speed performance obtainable by the cyclist for a given cycle or bicycle.

[0009] The invention includes a provision of one or more elastic members applied to the legs of the cyclist such that the elastic members will stretch on the downstroke of the pedals to generate energy and contract on the upstroke of the pedals to release the energy for assisting the cyclist's legs to rotate the pedals and in turn the sprocket.

[0010] However, in said application there is no evidence that the devices provided with bands, regardless of the aim for which they are used, have kneepads to help form the flexion angle on the rear part of the knees.

[0011] Other documents from the state of the art are:

US 5308305, which describes an apparatus for augmenting exercise of body muscle(s) comprising one or more articles of wearing apparel employing one or more resistance members.

US 6179760 B1 describes a method and/or device that includes elastic members used to assist the legs of the cyclist such that the elastic elements will stretch on the downstroke of the pedals to generate energy and contract on the upstroke of the pedals to release the energy for assisting the cyclist's legs to rotate the pedals and in turn the sprocket.

[0012] None of the aforementioned devices described in the state of the art has means in the form of kneepads that enable articulation with the aim of favoring and forming the flexion angle in the area of the knees, in addition to being especially designed for the practice of taekwondo or karate.

DESCRIPTION OF THE INVENTION

[0013] Therefore, with the aim of overcoming the shortcomings of current training apparatuses and for the purposes of ensuring that the characteristics of the apparatus correspond to the requirements of the practice of taekwondo and karate, the present invention aims to provide training pants to overload the user's leg with resistances and as a result increase their muscular force, thereby strengthening the user's legs. With said increase in muscular force and strength, the user is able to develop an improved technique in their legs, improving their kicks, thereby becoming more prominent in the majority of the martial arts, such as taekwondo and karate, arts in which

quick, agile and strong movements of the legs are required at the moment of contact.

[0014] One advantage of the training pants is that they are made up of a belt and heel supports that are adjustable in order to tighten the resistance bands and, furthermore, the pants are characterized in that they have kneepads that help form the flexion angle in the rear part of the knees.

[0015] The training bands have different degrees of resistance, going from 45N to 90N, depending on the user's experience in the practice of taekwondo or karate, which when multiplied by 4 bands that comprise the training pants, provide a total resistance ranging from 180N-200N to 320-360N.

[0016] With the force of resistance on the user's legs, the following kicking techniques can be practiced:

i) Ap chagi kick: This is a linear and frontal technique in which, by means of the training pants described in the present invention, the height of the back leg is improved with the knee flexed up to the middle of the torso. Furthermore, it improves the flexion in the supporting leg and the foot at an angle of 45 to 55 degrees from the attack line.

ii) Bandal chagi kick: The use of the training pants helps improve this semicircular technique which is initiated from the combat position, raising the back leg with the knee flexed in front at the height of the torso. It improves the flexion of the base leg and the angle of the foot at 90 to 100 degrees from the attack line.

iii) Dollyo chagi kick: This is a circular kick initiated from the combat position. With the training pants the elevation of the back leg is improved with the knee flexed at the height of the chest, allowing the rotation of the hip 90 degrees forward.

[0017] Likewise, in another use thereof, the training pants of interest can be used to practice high-performance sports or for improving one's physical condition, specifically for weight loss by burning calories.

[0018] Use of the training pants allows the focus to be on muscular strength and growth specifically in the desired muscle group, avoiding the use of oxygen and effort in muscle groups the user does not intend to use. Therefore, the quality of the training is improved by only focusing on one muscular group and the physical condition of the user to optimize competitive form.

[0019] Another advantage of the training pants consists of strengthening primary and secondary muscles which one is training. Likewise, tension is increased or decreased in a short period of time by only having to change the tension bands.

[0020] The training pants aim to improve the neuromuscular response and motor skills for practicing sports that combine speed, agility and force, such as karate and taekwondo. On the other hand, it allows the user to improve their coordination by allowing them to be more

aware of their movement patterns.

[0021] In another use, and calibrating the resistances to a lower tension, the training pants can be used for therapeutical and rehabilitation purposes.

[0022] Except when indicated otherwise, all of the technical and scientific elements used in this specification have the meaning commonly understood by a person with average skill in the art to which this invention belongs. When this invention is put into practice, methods and materials may be used that are similar or equivalent to the ones described in this specification.

[0023] Throughout the description and claims, the word "comprise" and its variants are not intended to exclude other technical characteristics, additions, components or steps. For those skilled in the art, other objects, advantages and characteristics of the invention may be deduced from both the description and the practical use of the invention.

EXPLANATION OF THE DRAWINGS

[0024] As a complement to the present description, and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with a preferred practical exemplary embodiment thereof, said description is accompanied by a set of drawings constituting an integral part of the same, which by way of illustration and not limitation represent the following.

Figure 1. Front view of the training pants.

Figure 2. Rear view of the training pants.

Figure 3. Front view of the pants with reinforced seams. The pants include four loops placed on the sides of the ankles.

Figure 4. Rear view of the pants with double reinforcement of the fabric on the channels of the bands on the part of the legs and calves.

Figure 5. Perspective view of the adjustable belt with 4 holes.

Figure 6. Front view of the kneepads.

Figure 7. Pairs of resistance bands.

Figure 8. Adjustable heel supports with holes for tightening.

DETAILED DESCRIPTION OF THE INVENTION

[0025] To achieve the objectives and advantages previously mentioned, the training pants comprise:

[0026] In reference to the drawings, figure (1) shows a pair of training pants (10) according to the invention.

[0027] The training pants (10) comprise resistance bands (21, 22, 21', 22') for a stable and detachable fastening at the upper end thereof around the belt or mid-section of a user of the training pants (10) and fastening means at the lower end thereof on heel supports (40).

[0028] The resistance bands (21, 22, 21', 22') are attached at the upper end thereof to the belt and at the

lower end thereof to the heel supports (40), passing through loops of the kneepads (30).

[0029] The belt (11) defines a surface that is adjustable to the user and has at least a snap-type buckle (12) that adjusts the belt depending on the size of the human user (FIG. 5). Likewise, the belt (11) includes a series of ring-shaped holes that are reinforced on the outer edge thereof (12, 13, 12', 13').

[0030] Whether or not the belt has more than one buckle will depend on the tension of the resistance bands.

[0031] With the aim of being able to be adjusted the user's body, the belt has at least one buckle, each one of which would comprise a female end (15) and a harpoon-type male end (14) that allows the two ends of the belt to be fastened.

[0032] The ring-shaped holes (12, 13, 12', 13') allow the upper ends of the resistance bands (21, 22, 21', 22') to be attached to the belt (11) at coupling points (211, 221, 211', 221') (figure 5), located on the upper edge thereof. The coupling points (211, 221, 211', 221') are introduced in the ring-shaped holes (21, 22, 21', 22') and separation of the resistance bands from the belt is prevented due to the tension of the band.

[0033] The belt is made of materials that are not harmful to the skin, using materials such as cork, rubber, neoprene, having a thickness of 0.5 mm to 7 mm. In another possible embodiment, the fastener can be double and the belt can have a thickness of 5 cm to 10 cm depending on the strength of the resistance bands.

[0034] In one possible embodiment, the pants (10) can be made of elastane, which is fastened around the waist or midsection of a human user of the training pants (10) by means of the belt (11).

[0035] The pants (10) have reinforced seams (50) on the front part thereof to prevent the structure from alterations or ruptures. Likewise, on the rear part thereof the pants have seams with double reinforcement (60) on the channels of the legs and calves.

[0036] The pants (20) also have kneepads (30, 30') placed around the knees which guide the tension bands along the user's legs. The material of the kneepads will preferably, but not by way of limitation, be made of polyester and other synthetic materials.

[0037] Each one of the kneepads (30, 30') has loops arranged on the lateral edges, in particular the kneepad (30) has two loops, two on the lower ends thereof (32, 34), and another two loops (31, 33) on the upper ends thereof, while the kneepad (30') has two loops on the lower ends (32', 34') thereof and two on the upper ends (31', 33') thereof through which the resistance bands (21, 22, 21', 22') are introduced to provide a stable fastening to the training pants.

[0038] With the aim of facilitating the passing the resistance bands (21, 22, 21', 22') through the lower (32, 34, 32', 34') and upper (31, 33, 31', 33') loops and avoiding the risk of an early rupture in the useful life of the product, the resistance bands are lined with a synthetic material or fabric that facilitates the path of the bands,

providing them with more protection and a longer duration.

[0039] Furthermore, the invention has heel supports (40, 40') placed around the sides of the ankle. The heel supports are made of a material that prevents rubbing against the skin and sores as a result.

[0040] Said heel supports (40, 40') have fastening means (41, 42, 41', 42') which serve to connect the lower parts of the resistance bands by means of coupling points (212, 222, 212', 222') located on the lower edge thereof.

[0041] In one possible embodiment, the fastening means (41, 42, 41', 42') provided on the heel supports for fastening the lower ends of the resistance bands (21, 22, 21', 22') are eyelets protected by a wall of neoprene, and in another, less professional embodiment, they may be hooks as a gripping means for the heel supports.

[0042] The fastening means (41, 42, 41', 42') can have metal parts, in the case that the pants are used for a hobby or personal training, however, in the case of using the pants for fighting or combat, in order to prevent injury to the heel support, it will not have any metal parts.

[0043] The coupling points (211, 221, 211', 221') of the resistance bands (21, 22, 21', 22') are introduced in the fastening means (41, 42, 41', 42') of the heel supports and thanks to the tension of the band, separation of the kneepads from the resistance bands is prevented.

[0044] On the other hand, the heel supports (40, 40') have joining ends made of Velcro® (44, 43) that adjust the lower part of the heel supports of the user depending on the size of the human user.

[0045] The heel supports (40, 40') have the advantage in that they are easily detachable from the foot and the user's ankles.

[0046] In order to achieve the tension in the pants, the user must put on the pants with the reinforced seams toward the front view. Afterwards, the user must proceed to place the belt at waist level and adjust the at least snap-type buckle, stretching the male section to make the connection with the female section of the buckle.

[0047] By joining the female section to the male section of the snap-type buckle, it must be verified that the belt perfectly couples to the size of the human user.

[0048] Then, the coupling points are introduced in the ring elements of the belt. It must be ensured that the coupling points are completely introduced in order to enable an ideal training for the user.

[0049] Subsequently, the bands attached to the belt are introduced through the fastening means (of the kneepads) and due to the tension of the band, separation of the resistance bands from the kneepads is prevented.

[0050] Lastly the lower coupling points of the tension bands are introduced in the fastening means placed on the upper part of the heel supports.

[0051] The heel supports help to tighten the lower ends of the bands.

[0052] By joining all of the characterizing parts one may obtain training pants made up of a belt and heel supports that are adjustable in order to tighten the resistance

bands, characterized in that they have kneepads that help form the flexion angle in the rear part of the knees.

[0053] Furthermore, the training pants allow the user to do a series of exercises, avoiding the distortion of the user's natural center of gravity or of their movement patterns.

[0054] In order to achieve the proper tension for each user, the experience of each user in the sport they are practicing must be considered.

[0055] For a first time user, the bands should be used with a resistance force of 45N to 50N, which when multiplied by 4 bands equals a total resistance of 180N to 200N, which increases depending on the exercise done.

[0056] For an advanced user, the bands should be used with a resistance force of 60N to 70N, which when multiplied by 4 bands equals a total resistance of 240N to 280N, which increases depending on the exercise done.

[0057] For an expert user, the bands should be used with a resistance force of 80N to 90N, which when multiplied by 4 bands is a total resistance of 320N to 360N, which increases depending on the exercise done.

[0058] The kneepads are then placed sewn to the piece of pants, which help form the flexion angle on the rear part of the knee.

[0059] Having thus adequately described the nature of the present invention, as well as how to put it into practice, it must be noted that, within its essential nature, the invention may be carried out according to other embodiments differing in detail from that set out by way of example, which the protection sought would equally cover, provided that the fundamental principle thereof is not altered, changed or modified.

Claims

1. A pair of training pants for practicing taekwondo or karate, which consist of a belt (11) and heel supports (40) that are adjustable in order to tighten resistance bands (21, 22, 21', 22') that can be joined to the belt (11) at the upper end thereof and to the heel supports (40) at the lower end thereof, **characterized in that** they have kneepads (30, 30') with loops through which the resistance bands (21, 22, 21', 22') pass that create tension in the flexion angle on the rear part of the knees.
2. The training pants, in accordance with claim 1, **characterized in that** the belt (11) includes a series of ring-shaped holes (12, 13, 12', 13') which are reinforced on the outer edge thereof, wherein the ring elements enable the fastening of the resistance bands on the upper ends thereof at coupling points (211, 221, 211', 221').
3. The training pants, in accordance with claim 2, wherein the belt (11) is **characterized in that** it has

at least a snap-type buckle, the female section (15) of which couples to a male section (14) in order to be able to adjust the training pants (10) to the waist of the user.

4. The training pants, in accordance with claim 1, **characterized in that** it has kneepads (30, 30') that have loops on the lower ends (32, 34, 32', 34') thereof, and on the upper ends (31, 33, 31', 33') thereof.
5. The training pants, in accordance with claim 1, **characterized in that** the heel supports (40, 40') have fastening means (41, 42, 41', 42') that are connected to the lower parts of the tensioning bands at coupling points (212, 222, 212', 222') located on the lower edge thereof.
6. The training pants, in accordance with claim 5, **characterized in that** the fastening means (41, 42, 41', 42') provided on the heel supports for fastening the lower ends of the resistance bands are eyelets protected by a neoprene wall.
7. The training pants, in accordance with claim 6, **characterized in that** the heel supports (40, 40') have joining ends made of Velcro® (44, 43) that adjust the lower part of the heel supports of the user depending on the size of the human user.
8. The training pants, in accordance with claim 1, wherein the constituent material of the pants is elastane, the constituent material of the belt and heel supports is nylon, and the constituent material of the kneepads is polyester.
9. The training pants, according to any of the preceding claims, **characterized in that** the resistance bands (21, 22, 21', 22') are made of a synthetic material or fabric to facilitate the path of the bands.
10. The training pants, according to any of the preceding claims, **characterized in that** the belt has a double fastener, made of synthetic materials or different types of rubber and with a thickness between 5cm and 10 cm.
11. The training pants, according to any of the preceding claims, **characterized in that** the pants (10) have reinforced seams (50) on the front part thereof to prevent the structure from suffering alterations or ruptures, while on the rear part thereof the pants have doubly reinforced seams (60) on the channels of the legs and calves.

Amended claims in accordance with Rule 137(2) EPC.

1. A pair of training pants for practicing taekwondo or karate, which consist of a pants, a belt (11) and heel supports (40) that are adjustable in order to tighten resistance bands (21, 22, 21', 22') that can be joined to the belt (11) at the upper end thereof and to the heel supports (40) at the lower end thereof, it is provided with kneepads (30, 30') with loops through which the resistance bands (21, 22, 21', 22') pass that create tension in the flexion angle on the rear part of the knees **characterized in that** the heel supports (40, 40') have fastening means (41, 42, 41', 42') that are connected to the lower parts of the tensioning bands at coupling points (212, 222, 212', 222') located on the lower edge thereof,
 - the fastening means (41, 42, 41', 42') provided on the heel supports for fastening the lower ends of the resistance bands are eyelets protected by a neoprene wall and,
 - the heel supports (40, 40') have joining ends made of Velcro® (44, 43) that adjust the lower part of the heel supports of the user depending on the size of the human user.
2. The training pants, in accordance with claim 1, **characterized in that** the belt (11) includes a series of ring-shaped holes (12, 13, 12', 13') which are reinforced on the outer edge thereof, wherein the ring-shaped holes (12, 13, 12', 13') enable the fastening of the resistance bands on the upper ends thereof at coupling points (211, 221, 211', 221').
3. The training pants, in accordance with claim 2, wherein the belt (11) is **characterized in that** it has at least a snap-type buckle, the female section (15) of which couples to a male section (14) in order to connect the ends of the belt.
4. The training pants, in accordance with claim 1, **characterized in that** it has kneepads (30, 30') that have loops on the lower ends (32, 34, 32', 34') thereof, and on the upper ends (31, 33, 31', 33') thereof.
5. The training pants, in accordance with claim 1, wherein the constituent material of the pants is elastane, the constituent material of the belt and heel supports is nylon, and the constituent material of the kneepads is polyester.
6. The training pants, according to any of the preceding claims, **characterized in that** the resistance bands (21, 22, 21', 22') are made of a synthetic material or fabric to facilitate the path of the bands.
7. The training pants, according to any of the preceding

claims, **characterized in that** the belt has a double fastener, made of synthetic materials or different types of rubber and with a thickness between 5cm and 10 cm.

8. The training pants, according to any of the preceding claims, **characterized in that** the pants (10) have reinforced seams (50) on the front part thereof to prevent the structure from suffering alterations or ruptures, while on the rear part thereof the pants have doubly reinforced seams (60) on the channels of the legs and calves.

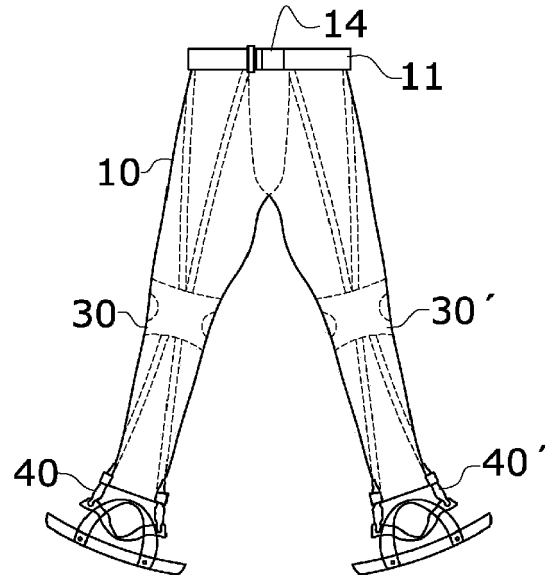


FIG.1

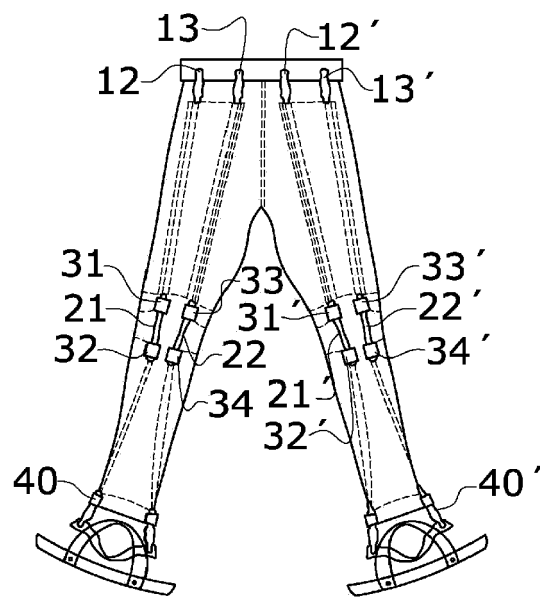


FIG.2

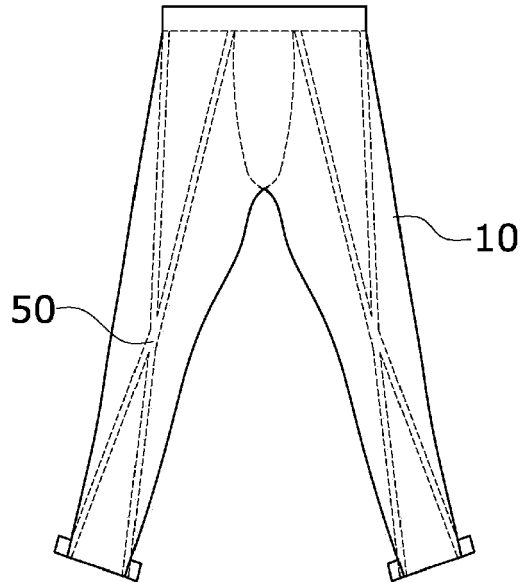


FIG.3

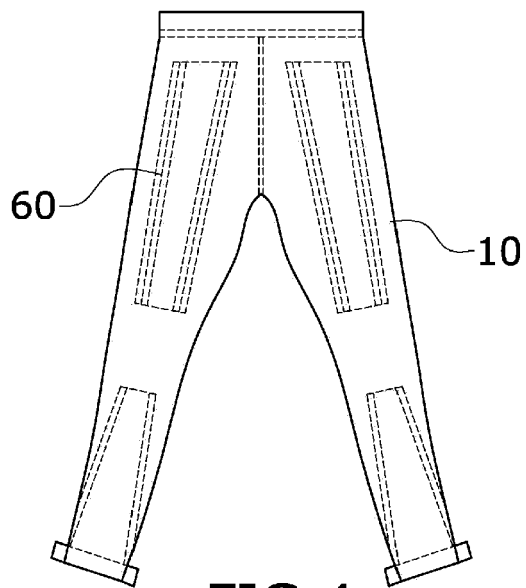


FIG.4

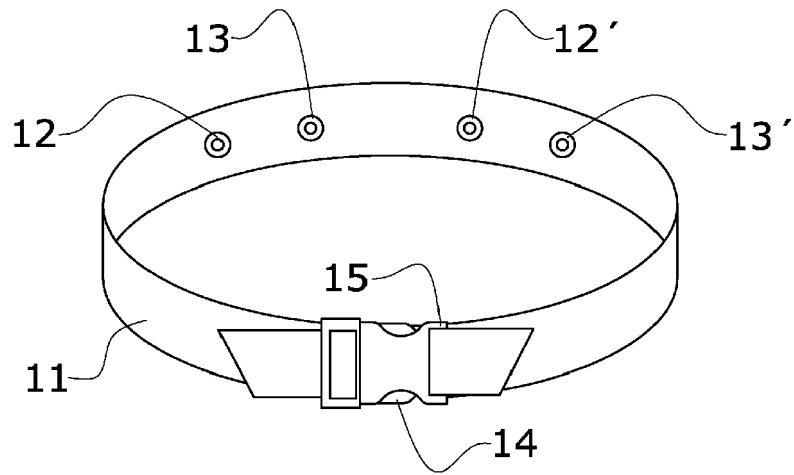


FIG. 5

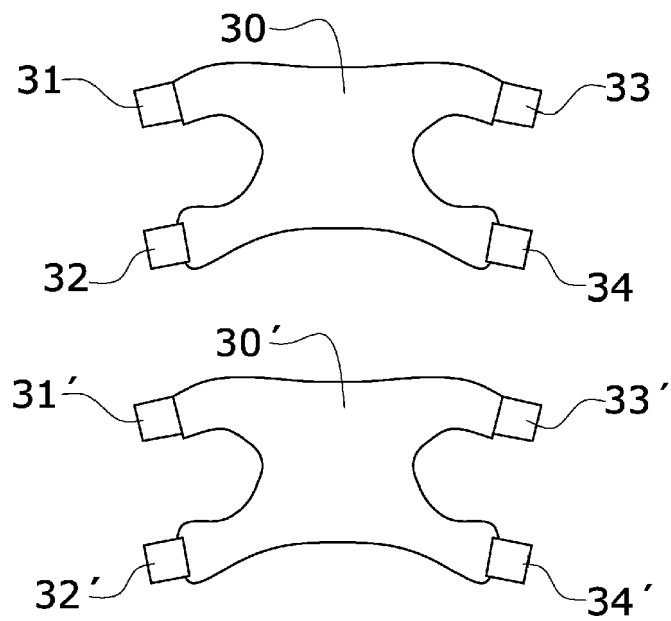


FIG. 6

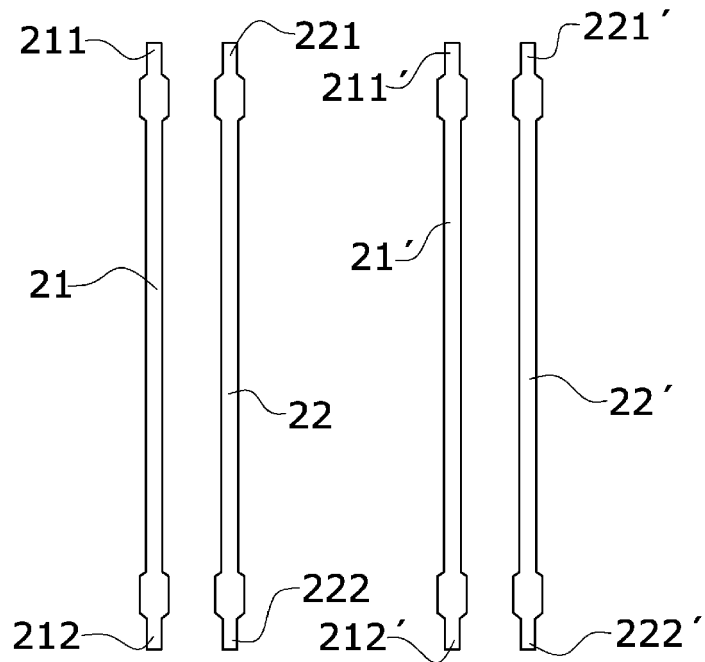


FIG.7

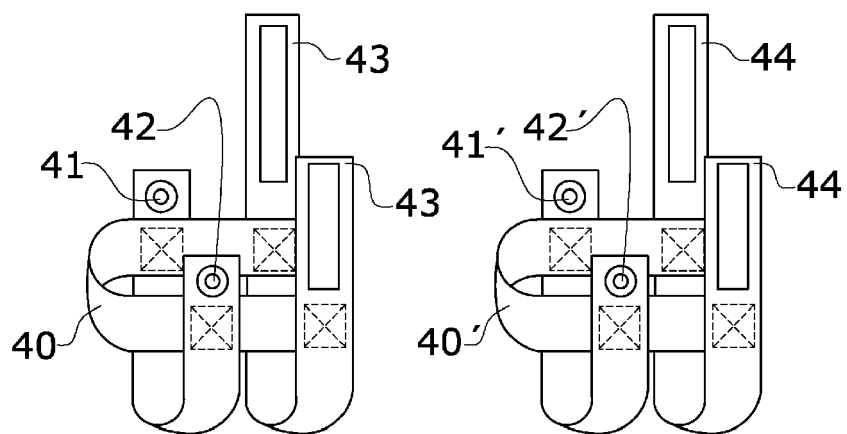


FIG.8



EUROPEAN SEARCH REPORT

 Application Number
 EP 18 15 2038

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 099 446 A (JOHNSON DERRICK [US] ET AL) 8 August 2000 (2000-08-08) * column 4, line 4 - column 6, line 11; figures 1-5 *	1-7,9-11	INV. A63B21/00 A63B21/055 A41D13/00
X	US 5 720 042 A (WILKINSON WILLIAM T [US]) 24 February 1998 (1998-02-24) * column 3, line 53 - column 5, line 37; figures 1-5 *	1,4,5,8	
X	ES 1 069 440 U (FERNANDEZ BOCANEGRA JAVIER [ES]) 16 March 2009 (2009-03-16) * column 3, line 32 - column 6, line 38; figures 1-5 *	1,5,7	
A	US 5 201 074 A (DICKER TIMOTHY P [US]) 13 April 1993 (1993-04-13) * column 4, line 9 - column 7, line 14; figures 1-13 *	1-11	
A	US 5 993 362 A (GHOBADI ARTHUR SOROUS [US]) 30 November 1999 (1999-11-30) * column 3, line 26 - column 8, line 19; figures 1-8 *	1-11	TECHNICAL FIELDS SEARCHED (IPC) A63B A41D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 29 June 2018	Examiner Jekabsons, Armands
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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 EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 15 2038

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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29-06-2018

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6099446 A	08-08-2000	NONE	
US 5720042 A	24-02-1998	AU 720241 B2 BR 9711496 A CA 2265493 A1 EP 0926959 A1 JP 2002515791 A US 5720042 A WO 9811792 A1	25-05-2000 24-08-1999 26-03-1998 07-07-1999 28-05-2002 24-02-1998 26-03-1998
ES 1069440 U	16-03-2009	ES 1069440 U WO 2010079244 A1	16-03-2009 15-07-2010
US 5201074 A	13-04-1993	NONE	
US 5993362 A	30-11-1999	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5203754 A [0005]
- US 6179760 B1 [0007] [0011]
- US 5308305 A [0011]