STRETCHING APPARATUS FOR STRETCHING THE BACK

The invention relates to a stretching appliance for the automatic stretching of one's own back. Many people suffer from back pain, and a stretching of their back on a stretching bed brings relief. However, conventional stretching beds are not so user-friendly and often cannot be operated alone, so that a person to be treated cannot therefore effectively use the stretching bed alone, but a therapist or an auxiliary person is required.

It is therefore the object of this invention, to specify a stretching appliance for stretching the back, which is extremely simple and pleasant to use, can be variably set for different body sizes and by way of which the stretching of the back can be very finely metered by the user himself during the application.

The object is achieved by a stretching appliance, consisting of a floor pate with mast which is adjustable in height thereon, at the upper end of said mast a rest is assembled, characterised in that the rest is pivotably mounted about a horizontal axis, that adjustable restraining means for the shoulders and feet are present on the rest and are connected to one another such that they can be moved apart and conversely can be moved again towards one another, in a coupled manner, by way of pivoting the rest about the horizontal position.

This stretching appliance and its individual parts are represented in the drawings and are described hereinafter, wherein the function of the stretching appliance is also explained and discussed.

There are shown in:

Fig. 1 the stretching appliance in a perspective view, with its functional construction for the pivoting of the rest, for the mutual displacement of the carriages which are displaceably arranged thereon, as well as for changing the length of the rest for differently tall persons;

Fig. 2 the compete stretching appliance in a perspective view, with the pads on the rest, said pads being attached on the two longitudinally displaceable carriages;

Fig. 3 the stretching appliance seen from the side, ready for use;

Fig. 4 the stretching appliance seen from the side, after having been mounted by a person for its use;

Fig. 5 the stretching appliance seen from the side, on pivoting the rest into the horizontal position, at half the pivot path;

Fig. 6 the stretching appliance seen from the side, on seesawing the rest about the horizontal position, and by way of this, the well-metered stretching and relaxation of the back;

Fig. 7 a refined design of the stretching appliance with a view into the inside, i.e. without cover plates or carriages;

Fig. 8 the refined design of the stretching appliance according to Figure 7, with the two carriages 11, 15;

Fig. 9 the refined design of the stretching appliance according to Figure 7 and 8, with a breast pad, and pads on the carriages, as well as with foot pads;

Fig. 10 the refined design of the stretching appliance according to Figure 9 with the casing of the mechanics, of the floor plate and of the height-adjustable feet.

Figure 1 shows the basic construction of this stretching appliance. It comprises a floor plate 9 with height-adjustable feet 10, so that these can be adjusted for a level resting in the case that the floor is not quite even, so that the stretching appliance stands on the floor without wobbling at all. A mast which here consists of two square profiles stands on the base plate 9. The square profile which is larger with regard to its inner dimensions forms a lower mast part 8, and the square profile which is smaller with regard to its inner dimensions forms the upper mast part 6 which is inserted in the lower mast part 8 and is guided therein and can be telescopically extended upwards out of this. A large deflection pulley 3 with two cable grooves is assembled at the upper end of the upper mast part 6. Its pivot 42 is carried by two limbs 41 which here are fastened on the upper mast part 6 obliquely to this. The rest consists of a base plate 14 as well as two carriages 11, 15 which are mounted on this base plate 14 in a displaceable manner in the longitudinal direction of the rest. The carriage 11 which is here at the bottom runs on the rollers 18 and is envisaged for the legs, and the upper carriage 15 rolls on the carriage rollers 2 and is envisaged for the upper body. The base plate 14 is articulated

on the pivot 42 of the large deflection pulley 3 via two rigid limbs 36 which project downward perpendicularly from it. With this, the rest with its base plate 14 and its two carriages 11, 15 as a whole is pivotable about the axis of the deflection pulley 3 and can thus be pivoted out of the approximately vertical position which is shown here, into a horizontal position and somewhat beyond this. A series of further components are present on the described elements of the stretching appliance, and these serve for the height adjustment of the rest, the pivoting of the rest as well as the synchronous displacement of the carriages 11, 15 to one another or away from one another, to be able to be effected smoothly and with little force effort. A cable pull with a steel cable 5 serves for this, and this steel cable 5 from a cable clamp 7 on the upper mast part 6 firstly leads downwards and then around a deflection roller 19 which is likewise assembled on the upper mast part 6. The steel cable 5 then leads upwards from this deflection roller 19, around a deflection roller 4 assembled at the upper end of the upper mast part 6, and from there, in the represented view, in the clockwise direction around the large deflection pulley 3 and from this onto the lower carriage 11, at the lower end of which a deflection roller 12 is assembled. The steel cable 5 is led around this deflection roller 12, and afterwards to a cable clamp 13 and then to the cable clamp 1 on the upper carriage 15. The steel cable 5 at the other side of this cable clamp 1 leads further around a deflection roller 16 on the upper carriage 15, and then back via the large deflection pulley 3 with its two cable grooves. The steel cable 5 is led around this deflection pulley 3 in the clockwise direction in the represented angle of view, and then led onto a small deflection roller 4 on the side of the upper mast part 6 which is at the rear in the picture, and around this in the anti-clockwise direction in the shown view, and from this finally down into the lower mast part 8, on which the cable end of the steel cable 5 is fastened via a cable tensioner 20.

The setting of the lying height of the rest is effected by way of telescopic extension of the mast with its two mast parts 8, 6, which is assisted by a gas compression spring 21 of the type which are installed for boot lids of automobiles. The weight of the rest is thus practically neutralised and the mast can be extended and retracted with only little force effort. The rest is secured at a set height, as is represented by way of Figure 2. The picture in Figure 1 thus only shows the basic framework for the height adjustment and the pivoting of the rest into the horizontal position, as well as the rollers 2, 18 for the mounting of the displaceable carriages 11, 15, at the lower end and upper end of the rest. The cable pull with its steel cable 5 and its two fixedly clamped ends is designed and led in a manner such that the carriages 11, 15 always move synchronously to one another, thus are commonly or mutually displaced towards one another or however are mutually moved apart. As is explained later, in this context they are also displaced such that the rest can be adapted to the

height of a certain person in an extremely simple manner. These positions of the carriages 11, 15 which are set once for a person, are retained thereafter, even if the complete rest is pivoted about the axis pivot of the deflection pulley 3, and they are also retained irrespective of the height of the rest which was previously set by way of adjustment of the mast.

Figure 2 goes into more detail and shows that special pads 33, 34 are assembled on the carriages. A two-part pad 33 for both legs is assembled on the lower carriage, and a pad 34 for the upper body and which in the middle continues downwards between the leg pads 33 is assembled on the upper slide. The edges of the pads 33, 34 which lie opposite one another are bevelled with respect to the longitudinal direction of the rest. The pads 33, 34 are pushed together in an exactly fitting manner when the carriages are displaced to one another, and they get into the position as is shown in Figure 2, when displaced apart. The rest at the end which is at the bottom here is shaped out into a standing surface 31 or a footboard, upon which one can step in the shown position of the rest. The restraining elements in the form of foot pads 32 for the ankles are to be seen above this standing surface 31. Hereby, it is the case of padded rollers for each foot. The user for example firstly with his one foot, from the outside, steps between the two rollers or foot pads 32 and places the foot upon the standing surface 31. The same is done with the other foot afterwards. Both feet are then on the standing surface 31 and the two padded rollers enclose the lower leg just above the ankles. An upper arm pad 22 in the form of a cross member to the rest is arranged at the upper end and of the rest and is connected to the upper carriage and therefore as a whole is displaceable on the rest in the longitudinal direction of the rest. Two tube arcs below this cross member project upwards on the rest, similarly to fork prongs, wherein these are also padded. These fork prongs form the armpit support pads 35, as will become apparent further below when explaining the usage of the stretching appliance. The two armpit support pads 35, on the cross member of the upper arm pad 22, can be displaced outwards in each case in opposite directions to one another thanks to a synchronisation mechanism 27 with restoring springs 28, in order to be able to set different thorax widths.

The upper arm pad 22 as well as the armpit support pads 35 therefore together with the upper carriage 15 are displaceable on the rest in the longitudinal direction of this rest, wherein their displacement effects or forces the exact complementary, oppositely directed displacement of the lower carriage 11 with the restraining elements or foot pads 32 for the ankles, thanks to the clever cable connection. Figure 2 moreover shows two gas compression springs 17 between the upper region of the upper mast part 6 and the rest. These gas compression springs 17 assist the pivoting of the rest

about the rotation pivot or axis 42 of the deflection pulley 3, so that to all intents and purposes a torque compensation is ensured, and the pivoting and return pivoting of the rest is effected with little force effort, which is to say only a low torque needs to be mustered.

A grip bar 23 is articulated on the upper mast part 6 at the side of this upper mast part 6 which is at the left in the picture, which is to say at the front. A slide 25 is displaceably mounted on this arcuate grip bar 23 and carries the hand grips 24 projecting at both sides, and the grip bar 23 is supported by a gas compression spring, so that its weight is neutralised. A toothed rail 30, on which a locking lever 29 with its front detent or locking tooth locks in, is assembled on the opposite rear side of the lower mast part 8. This locking lever 29 is pivoted away from the toothed rail 30, in the idle position, when no user stands on the standing surface 31. It is only locked in via a mechanism at that moment when pivoting or tilting procedure of the rest is initiated, as is described hereinafter.

Figure 3 shows the stretching appliance seen from the side, in the starting or initial position. One recognises that the locking lever 29 is released, and the stretching appliance is mounted by the user in this position. For this, he approaches from the right in the picture and steps with his first foot upon the standing surface 31, wherein for this he pushes his ankles from the outer side between the foot pads 32. This are pushed apart by way of this. The user thereafter places his other foot upon the standing surface 31 in the same manner. Next one can better consider Figure 4. The user opens the armpit support pads 35 by way of him pushing the two prongs formed by these pads, apart in the horizontal direction, which is effected by a mechanism which ensures the synchronous movement of the twp prongs, until the user with his upper body just fits between these and can lean with this breast on the upper carriage 15. He then lifts the cross member with the upper arm pad 22 by hand, until the armpit support pad 35 can come to lie directly below his armpits, as is shown in Figure 4. On lifting the cross member with the upper arm pad 22, the upper mast part 6 by way of this is also simultaneously pulled out of the lower mast part 8 by a certain relation which is given by the cable pull, so that the complete stretching appliance is automatically adapted to the body height of the user. A taller user requires a pivot axis which lies higher than in the case of a short user.

In the next step, as is shown in Figure 5, the user grips the grips 24 on the grip bar 23 and pulls himself together with the rest, on which he now leans, towards the grip bar 23. The upper arm pads 22 thereby come to lie below the upper arms, directly subsequent to the shoulder, and by way of this the locking lever 29 with its tooth is

engaged on the toothed rail 30 on account of a mechanical connection. On pulling on the grip bar 23, as a result the rest is tilted and pivots in a controlled manner towards its horizontal position, as is shown in Figure 5, where half the pivot movement has already been covered. The complete pivot movement however is damped by way of the two gas compression springs 17 (Fig. 1, 2) which are not drawn here and which are between the rest and the upper mast part 6, and this movement can therefore be effected in a completely gentle manner, under 100% control of the user. He controls the pivoting with the grips 24 on the grip bar 23. The more he pushes these grips 24 on the grip bar 23 to the front, the more rapidly is the pivoting into the horizontal position effected, and the two carriages 15, 11 are moved apart in accordance with the extent of this pivoting into the horizontal position.

The user finally reaches the horizontal position on the rest, as is represented in Figure 6. The grips 24 which on a slide are displaceable on the grip bar 23 are pushed towards the end of the grip bar 23. The actual stretching of the back is now effected in this position, specifically by way of the user, by way of him holding on the grips 24, rocking which is to say seesawing somewhat forwards and backwards with the rest. When he seesaws forwards, the two carriages 11, 15 are pushed apart by the pull cable as a result of the pivoting of the rest about the mast, in accordance with the extent of the seesaw movement in the forwards direction. The foot pads 32 on the one hand, and the armpit support pads 32 as well as the upper arm pads 22 on the other hand, increase their distance to one another - and the back of the user is stretched. The upper arm pads 22 thereby form a counter-bearing for the armpits, which is necessary so that the back can be stretched between the armpits and the foot pads 32 by way of the two carriages 15, 11 moving apart. Conversely, when the user pushes away from the grips 24, then a pivoting of the rest in the opposite direction, thus in the clockwise direction in the picture, is activated. This pivoting of the rest about the mast, as a result of the cable pull connections, has the effect that the two carriages 11, 15 with the armpit support pads 35 and the foot cushion 32 are pushed towards one another which leads to a relaxation of the back. The user therefore can stretch his back intermittently to the exact extent as he feels is good for him, by way of very simple and very well controllable seesaw movements. He has complete control over the stretching at all times and can immediately relax at any time, in the case that the stretching becomes too much for him. In many cases, a few seesawing movements are sufficient, in order to cause a very sufficient relief and to ease tension in the back region, in a beneficial manner.

Figure 7 shows a refined design of the stretching appliance without carriage, padding and casings. One can recognise the important design features, specifically the base plate 14 of the rest, on which the two carriages which are not yet placed are then

mounted in a rolling manner. Deflection rollers 12, 16 for cable leading of the steel cable 5 are arranged in a manner lying on the base plate. The complete base plate 14 is connected to the pivot 42 of the large deflection pulley 3 via the two limbs 36 and is pivotable about this pivot or axis 42. The standing surface 31 with the two holders for the feet or the lower leg just above the ankles is further visible. The gas compression spring 21 for assisting the extension of the mast is visible on the mast. One can moreover see the cable clamp 7 for fastening the one end of the cable 5 to the upper mast part 6, as well as the deflection roller 4 and the large deflection pulley 3 to the upper mast part 6. It is merely two arcuate grip bars 23 whose ends directly form grips 43, which serve here instead of an individual grip bar 23 (Fig. 2) with hand grips 24 which are displaceable therein. These grip bars 23 are aligned at an angle of 80-100° to one another, so that they are aligned in an ergonomically favourable manner for gripping. The grip bars 23 are moreover connected to the upper mast part 6 by way of a gas compression spring 26. The stretching appliance stands on a floor plate 9 with height-adjustable feet 10.

The stretching appliance with the two carriages 15, 11 which are now placed on is shown in Figure 8. These two carriages 15, 11 can be rolled away from one another in a synchronous which is to say equal and opposite manner, and can be rolled towards one another, again in a synchronous manner, which is ensured by the leading of the installed cable pull about the deflection rollers which are arranged below the two carriages 11, 15. With the stretching appliance as represented in Figure 9, the padding and the casing have been built on. Firstly, the upper carriage is provided with a padding 34 which here at its upper end also comprises a construction lying at the inside which is formed into an upper arm pad 22. The upper end of this upper arm pad 22 therefore comes to lie on the upper arms of the user, directly below his armpits, when he grips the two arcuate grip bars 23 at their front ends or grips 43, over these two upper arm pads 22. The lower carriage is likewise provided with a padding 33, wherein the padding 34 of the upper carriage can be pushed into a central recess in the padding 33 of the lower carriage, when the two carriages are pushed together. The holders for the feet are provided with cylindrical foot pads 32. The lower leg can clamped in between these two foot pad pairs, in a manner close to the ankles, after the user has stepped on the standing surface 31 and has placed his legs between foot pad pairs. The steel cable 5 and the gas compression spring 21 for assisting the upwards extension of the mast and thus for assisting the lifting of the base plate which is to say the rest together with the deflection roller 4 and the large deflection pulley 3 for leading the steel cable 5 of the pull cable, can be recognised on the mast parts. The stretching appliance is represented in the coupled condition in Figure 10. The complete mechanical

construction in the inside of its mast as well as the mast itself, are covered by casing parts 37, 38, 39. The floor plate is also enclosed all around by a casing 40.

List of reference numerals

1	cable clamp, top
2	carriage roller, top
3	large deflection pulley
4	deflection roller
5	steel cable
6	mast part top
7	cable clamp on mast
8	mast part, bottom
9	floor plate
10	height-adjustable feet
11	carriage bottom, at the foot side of the rest
12	deflection roller on the carriage, bottom
13	cable clamp, bottom
14	base plate of the rest
15	carriage, top, at the head side of the rest
16	deflection roller carriage, top
17	damper, base plate
18	carriage roller, bottom
19	deflection roller
20	cable tensioner
21	gas compression spring for extending the mast
22	upper arm pad
23	grip bar
24	hand grip
25	slide
26	gas compression spring for grip bar
27	mechanism, width setting
28	restoring spring for mechanism 27
29	locking lever
30	toothed rail
31	standing surface
32	foot pad
33	pad on foot-side carriage
34	pad on head-side carriage
35	armpit support pad

36 limbs projecting perpendicularly from the base plate 14
37 casing of the upper mast part
38 casing mast
39 casing front on the mast
40 all-round casing of the floor plate 9
41 limbs on the upper mast part
42 pivot of the large deflection pulley 3
43 grips on the grip bars 23

Patent claims

1. A stretching appliance, consisting of a floor pate (9) with a mast (6, 8) which is adjustable in height thereon, at the upper end of which mast a rest is assembled, characterised in that the rest is pivotably mounted about a horizontal axis (42), that adjustable restraining means for the shoulders and feet are present on the rest and are connected to one another such that they can be moved apart and conversely can be moved again towards one another, in a coupled manner, by way of pivoting the rest about the horizontal position.

2. A stretching appliance according to claim 1, characterised in that the restraining means for the shoulders are connected to a carriage (15) which is displaceable in the longitudinal direction of the rest, and the restraining means for the feet are connected to a carriage (11) which is displaceable in the longitudinal direction of the rest, and that the two carriages are connected to one another such that they can be rolled or displaced apart and conversely can be moved again towards one another, in a coupled manner, by way of pivoting the rest about the horizontal position.

3. A stretching appliance according to one of the preceding claims, characterised in that the rest is pivotably mounted on a height-adjustable mast (6, 8) about a horizontal axis (42), that adjustable restraining means in the form of upper arm pads (22) which run transversely to the rest and are for the two regions of the upper arms of the user, said regions being close to the shoulder, are built on a displaceable carriage (15) at the head side of the rest, and the restraining means for the feet are built on a displaceable carriage (11) at the foot side of the rest, and a standing surface (31) which runs perpendicularly to the rest is formed on this rest, at the foot end of the rest, and at least one grip bar (23) for the manually controlled pivoting of the rest is articulated on the front side of the upper mast part (6), wherein the displaceable carriages (15, 11) together with the restraining means (2, 19, 4, 12, 16) for the upper arms and the feet, by way of cable pulls and deflection rollers on the carriages (15, 11) and on the mast (6, 8), on the rest can be moved apart and conversely can be moved again towards one another, in a coupled manner, by way of the pivoting of the rest about the horizontal position.

4. A stretching appliance according to claim 2, characterised in that the adjustable restraining means additionally to the upper arm pads (22) also include armpit support pads (35) for the armpits, on the upper carriage (15), in the form of

arched and padded tubes which extend upwards from the plane of the carriage (15) with its pad (34), essentially roughly perpendicularly to this plane.

5. A stretching appliance according to one of the preceding claims, characterised in that the restraining means for the shoulder and those for the feet are connected to one another via a cable pull with a cable (5) of a fixed length via several deflection rollers (19, 4, 3, 12, 16), such that they can be moved apart and conversely can be moved again towards one another, in a coupled manner, by way of the pivoting of the rest about the horizontal position.

6. A stretching appliance according to one of the claims 4 to 5, characterised in that the armpit support pads (35) are adjustable in their distance to one another synchronously to the middle line of the rest, by way of a synchronisation mechanism (27).

7. A stretching appliance according to one of the preceding claims, characterised in that the mast consists of a lower mast part (8) and of an upper mast part (6) which is telescopically guided therein, and the rest can be pivoted about a horizontal pivot (42) comprising a deflection pulley (3) with two cable grooves, and the cable leading of the steel cable (5) from a cable clamp (7) on the upper mast part (6) firstly leads downwards, is then led round a deflection roller (19) on the lower end of the upper mast part (6), then around a deflection roller (4) on the upper end of the upper mast part (6), from there around the side of the deflection pulley (3) which is directed to the head side of the rest, to the deflection roller (12) on the foot-side side carriage (11), around this and then to the cable clamp (1) on the head-side carriage (15), from there further around the deflection roller (16) on the head-side carriage (15) and afterwards around the side of the large deflection pulley (3) which is directed to the foot side of the rest, and around a deflection roller (4) on the upper mast part (6) and from there to a cable tensioner (20) on the lower mast part (8).

8. A stretching appliance according to one of the preceding claims, characterised in that the carriages (11, 15) are roller-mounted on the rest in the longitudinal direction of the rest, by rollers (2, 28).

9. A stretching appliance according to one of the preceding claims, characterised in that the pivot mechanism and thus the pivot movement of the rest on the mast is damped by way of gas compression springs (17) which are installed in a manner acting between the base plate (14) of the rest and the upper mast part (6).

10. A stretching appliance according to one of the preceding claims, characterised in that the grip bar (23) is curved forwards and is provided with a slide (25), on which two grips (24) project to the left and right, wherein the grip bar (23) is connected to the upper mast part (6) by way of a gas compression spring (26), for force neutralisation and for force damping.

11. A stretching appliance according to one of the claims 1 to 9, characterised in that two arcuate grip bars (23) are articulated on the upper mast part (6) and their ends are designed as grips (43) for ergonomic gripping and end at an angle of 80-100° to one another, wherein the grip bars (23) are connected to the upper mast part (6) by way of a gas compression spring (26), for force neutralisation and for force damping

12. A stretching appliance according to one of the preceding claims, characterised in that the carriages (15, 11) are provided with pads (34, 33) which can be positively displaced or pushed into one another.

13. A stretching appliance according to one of the preceding claims, characterised in that a locking lever (29) which can be engaged with its locking tooth into a toothed rail (30) on the lower mast part (8) is articulated on the upper mast part (6), wherein the locking can be activated by way of a mechanism, by way of pivoting the rest.

14. A stretching appliance according to one of the preceding claims, characterised in that at least one gas compression spring (21), for receiving the weight of the upper mast part (6) and of the rest constructed thereon, is installed between the upper mast part (6) and the lower mast part (8), so that the height adjustment of the rest can be carried out in a largely weight-neutralised manner.

15. A stretching appliance according to one of the preceding claims, characterised in that the complete mechanical construction in the inside of its mast as well as the mast itself and the floor plate are covered with casing parts (37, 38, 39, 40), so that the mechanical construction cannot be seen.