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(54) Collapsible physical training device

(57) The present invention is for a collapsible training device. The device comprises two vertical slide bars (2, 3) and along them movably arranged both a weight stack (1) and a carriage (9) by which various parts of the training device may be connected to the weight stack. The weight stack (1) comprises several plates which at their outer ends are movably arranged at the slide bars. Each plate of the weight stack has at its outer end an essentially semi-circular slide bushing for contacting

against the respective slide bar (2, 3). The device also comprises a sitting board which may be set at any selected height by support legs. The support leg means comprises one into the other telescopically displaceable upper and lower leg whereby the outer legs (32, 33) are permanently joined to each other by at least one bar (28) having one on the bar movable catch (34) which is arranged to cooperate with slits (31) at the inner legs (29, 30).

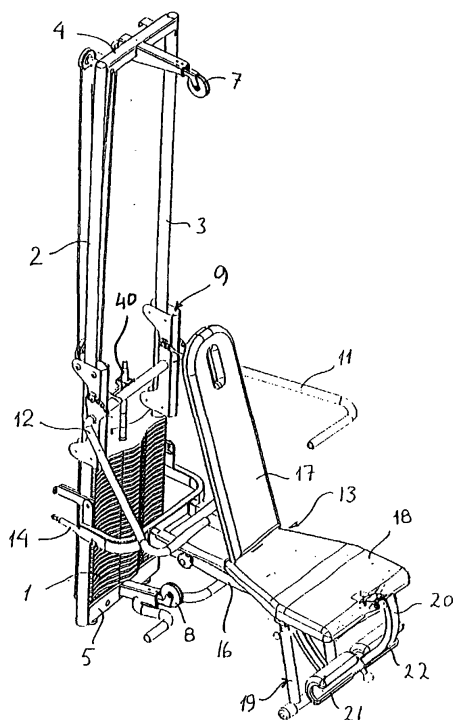


FIG 1

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Description

[0001] The present invention is for a device for physical training. The invention also is for a method for manufacturing of a component included in the device and a support. The device according to the invention makes allround training possible using an equipment which is collapsible and when not in use it may be concealed inside a wardrobe of regular size.

[0002] The development of the society has brought with it that more and more people no longer satisfy the need of physical activity of the body in the daily work, in order to prevent short term and long term damages or weakness which causes risk for damages there is an increasing need of physical activity in the form of training according to a specific program in order to activate and strengthen all muscles and groups of muscles. This also necessitates an equipment which makes many different training phases or exercises possible. Such equipment is available at special training premises where the equipment is comprised by a number of different devices where one or a low number of training phases may be performed at each single equipment. Both for space and cost reasons a full such equipment is impossible or unsuitable for home use. There are also combined and collapsible equipments which are intended for homes and small premises, however, these known devices do not fulfil the combined requirements for versatility, fold-up possibility to a limited outer volume and quality.

[0003] The object of the present invention is a training device for use at homes and small training premises which when not in use may be folded up and be held within the volume which is delimited by a normal wardrobe and which may be unfolded and make a full training program possible. Primarily the equipment is intended to be mounted at a wall or in a corresponding way and when folded up be fully enclosed within a standard size wardrobe. The doors of the wardrobe are opened for use. Among the exercises which may be performed using the device are knee extension, chest press, inclined press, squat and exercising the back of the thigh, shoulders and arms.

[0004] This is achieved with a device according to the invention that comprises a load stack with a number of load plates. By means of these load plates a suitable load for each exercise may be obtained, however, some exercises may be performed without making use of the load plates. The load plates are directed by two parallel, vertical bars on which also a vertically upwards and downwards movable carriage is running. The device further comprises a sitting board having an outer support stand the height of which is easily adjustable for various persons and exercises.

[0005] The device according to the invention and embodiments thereof have those characteristic features which are mentioned in the claims.

[0006] The invention will below be described more in detail with reference to the example of an embodiment

which is shown in the enclosed figures.

[0007] Figure 1 shows the device in unfolded position for exercises in sitting position.

[0008] Figure 2 shows the device of figure 1 in another view.

[0009] Figure 3 shows folded-up position.

[0010] Figure 4 shows unfolded from a wardrobe.

[0011] Figure 5 shows parts of the device more in detail.

[0012] Figure 6 shows the support means for the sitting board.

[0013] Figures 7-9 show details of the support means.

[0014] Figures 10 and 11 show a weight plate and a slide bushing.

[0015] The device according to the invention may include or be mounted into a wardrobe and look like a part of the interior of the home or location when the device not is in use. At the exercise occasions the wardrobe is opened and the device is unfolded as shown in figure 4.

This figure shows a wardrobe which made so that it is opened by doors each including half of the front and one sidewall of the wardrobe, in other embodiments ordinary wardrobes having front doors may be used. The press handles 11, 12 which are included in the device are dismountable and may be attached to the inside of the doors when the device is to be folded up. Some exercises using the press handles may also be performed when the rest of the device is folded up and positioned inside the wardrobe as the movements of the set of weights 1 and the carriage 9 not are hindered by the other parts of the folded up device.

[0016] The weight load of the machine comprises cast plates in a weight stack 1 which runs between slide bars being two parallel tubes 2, 3 which together with upper and lower bar 4, 5 form a stand, the plates are sliding arranged with slide bushings at the tubes. When exercising a desired number of weights are connected as loading. As the distance between the slide bars has been increased to maximum the risk that the weights will slip sideways and get stuck is reduced. The slide bushings are thread or moulded over the plate shaped weights and make a distance between adjacent plates. Preferably the bushings generally have the shape of semi-circles which makes it easy to add or remove plates to or from the weight stack. The desired number of plates is connected to a pull bar 40 which runs through a centre hole in each plate and by means of wire which as connected at its upper end can be connected to other parts of the device. The pull bar has a number circumferential grooves and the number of plates to be used as load at a given moment is chosen thereby that a fork means is inserted between two plates and grips around the pull bar in one of the circumferential grooves. When the pull bar is pulled upwards those plates which are positioned above the fork will follow with the bar upwards. The pull bar is connected to the cross bar 26 at the carriage using a locking means 41 or a wire from the upper section of the pull bar. By the design of the weight

plates having a concentration of mass to the middle of the plates good stability is achieved also when only one or few plates are used as load.

[0017] The pull bar is preferably in the shape of a hollow tube so that a wire, which is connected to the pull bar and directed upwards may be inserted into the pull bar. At its lowermost end the wire has a weight the diameter of which is greater than that of the wire but smaller than that of the hole through the pull bar. At its upper aperture the hole has a limiting ring through the opening of which the wire may pass readily but the weight cannot pass through. By this it is achieved that an unloaded wire is pulled into the pull bar instead of forming uncontrolled and obstructing bends within the device.

[0018] In a preferred embodiment of the invention the semicircular slide bushings 6 have a conical ridge 42 on one side and a corresponding conical groove 43 at its underside so that the weight plates 44 are directed into proper positions relative to one another. The side 41 of the slide bushing which is turned towards the slide bar is slightly bent in order to facilitate adding or removing weight plates to or from the weight stack. A preferred mode for the manufacturing of the slide bushings is that they are cast or injection molded from a suitable plastic material directly on to the weight plates which then are inserts in the mold. In this way one achieves a very high precision production which together with the concentration of the mass of the weight plates to their centres brings with it safe function without risk for misfit and blocking at the movements of the weight stack.

[0019] The upper and the lower bar of the stand each at their outer ends have a pulley wheel 7, 8. The upper pulley wheel rotates around a horizontal shaft. The shaft or the equivalent is hollow so that the wire is taken through the shaft and over to the pulley wheel without breaking or change of direction.

[0020] From both the upper and the lower pulley wheel there is a wire which at its end has a coupling means (snap-hook). When one connects a handle bar and pulls one of the wires then the weight stack is affected with a ratio of 2:1. One may also connect so that a ratio of 1:1 is achieved, one then makes use of an additional wire and connects the upper one with the lower wire coupling, which means that the load may be varied from about 1-80 kg, suitably in intervals of 1-3 kg.

[0021] It is also possible to connect to a carriage 9, the carriage has ball bearing radius wheel 10 and runs on the same tubes 2, 3 which control the plates of the weight stack. The carriage is balanced by means of a counter weight, the counter weight moving in the same tubes as controls the weight plates and it is connected to the carriage by means of wire and a pulley wheel. In a connected state the carriage is "pulled up" by the counter weight to the top part of the parallel tubes which control the weight plates.

[0022] When connecting one pulls down the carriage and using a simple connecting means 41 one connects it to the weight stack. In this position one may connect

two press handle bars 11, 12, these handles are usually hanging on the doors and may easily be connected to the carriage and set at many different positions.

[0023] For further exercises a full bench 13 may be unfolded, for safe unfolding the bench is balanced by turning springs 14. A full bench has two main sections: inner section 15 which is pivotably connected to the stand and an outer section 16 which may be adjusted to or from the stand as it runs outside the inner section. Besides the stand 16 the outer section consists of back support 17, seating support 18 and a folding support means 19. The back support is adjustable from 0-90° and also comprises a pulley wheel which by means of a wire is connected for stomach exercises. The sitting support is adjustable from 0-30°, the sitting support also comprising a pivot member 20 which has two adjustable leg rolls 21, 2 for leg exercises. To be adjusted to individuals of various heights the back support may be displaced essentially horizontally independent of the sitting support. The displacement is made using a means with a ratio of 1:2 in order to facilitate the setting in a proper position. The sitting support may also be pivoted upwards and kept in an up position by a locking means, the up position is used for certain exercises standing up.

[0024] When exercising the legs a wire is connected between the pivot member and the wire connection of the lower bar. The support is unfolded at the unfolding of the whole bench and it has adjustable feet at the floor.

[0025] The support 19 comprises a lower bar 27, an upper bar 28 having a locking means for adjustment of the height of the support, two lower, outer legs 32, 33 and two upper, inner legs 29, 30 which in a telescopic way are inserted into the lower legs. On one side of the upper legs there are a number of slits 31 for the locking of the upper and lower legs relative to one another. The locking means comprises a displaceable locking plate 34 which may be attenuated by a handle 35. The locking plate slides on the upper bar 28 and the edges of the locking plate are folded over so that it may not be lifted off from the bar. There is a hole 39 in the locking plate through which one of the legs may pass. In the hole 39 there is a locking lug 37 and there is a corresponding locking lug 39 at the outer end of the locking plate. The locking plate is pushed towards the locked position (to the right in the figures 8 and 9) by a spring 35 which works between the locking plate 34 and the bar 28. For setting of the height of the support the locking plate is pulled to the side using the handle 35 so that the locking lugs 37, 38 are released from the slits 31 whereupon the legs may be set at the desired position. When the handle is released the upper and the lower legs are again locked relative to one another.

Claims

1. Collapsible training device **characterized in that** it comprises two vertical slide bars (2, 3) and along

them movably arranged both a weight stack (1) and a carriage (9) by which various parts of the training device may be connected to the weight stack.

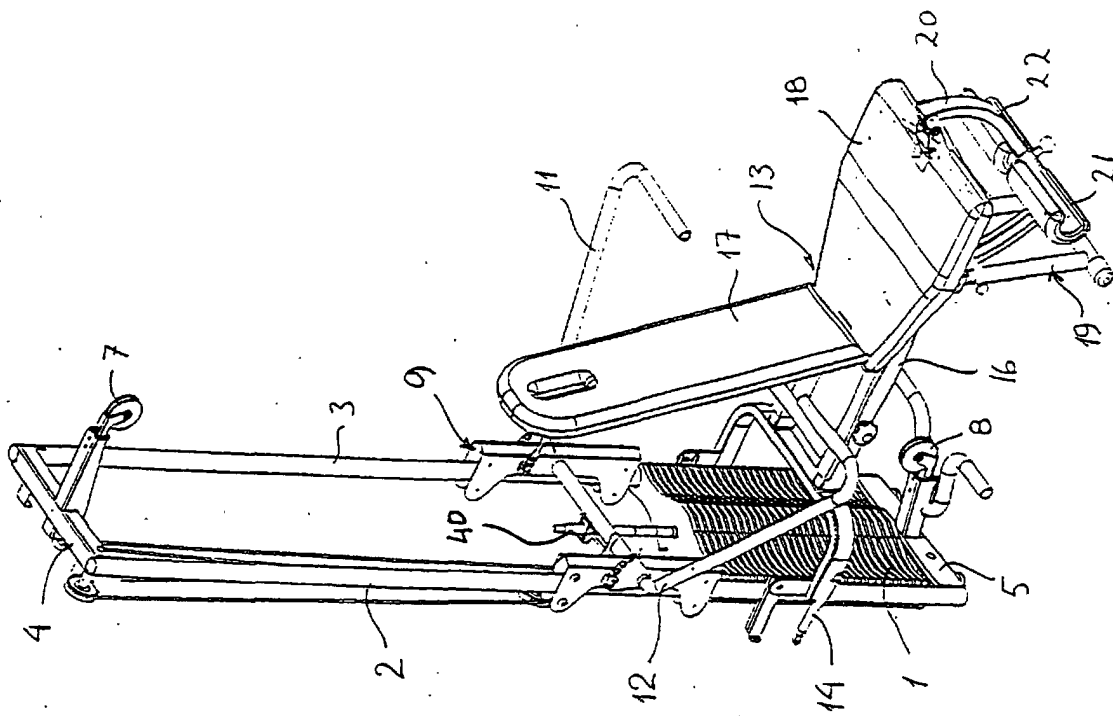
2. Device according to claim 1 **characterized in that** the weight stack (1) comprises several plates which at their outer ends are movably arranged at the slide bars. 5
3. Device according to claim 2 **characterized in that** each plate of the weight stack at its outer end has an essentially semi-circular slide bushing for contacting against the respective slide bar (2, 3). 10
4. Device according to claim 3 **characterized in that** a conical ridge (42) is arranged at one side of the slide bushing and a corresponding conical groove (43) at the other side thereof in order to control the weight plates (44) relative to one another. 15
20
5. Device according to claim 3 or 4 **characterized in that** that side (41) of the slide bushing which is facing the slide bar is somewhat curved. 20
6. Method for manufacturing of slide bushing according to any of the claims 3-6 **characterized in that** the slide bushing (6) is cast or injection molded directly at the respective weight plate (44). 25
7. Support leg means having one into the other telescopically displaceable upper and lower leg **characterized in that** the outer legs (32, 33) are permanently joined to each other by at least one bar (28) having one on the bar movable catch (34) which is arranged to cooperate with slits (31) at the inner legs (29, 30). 30
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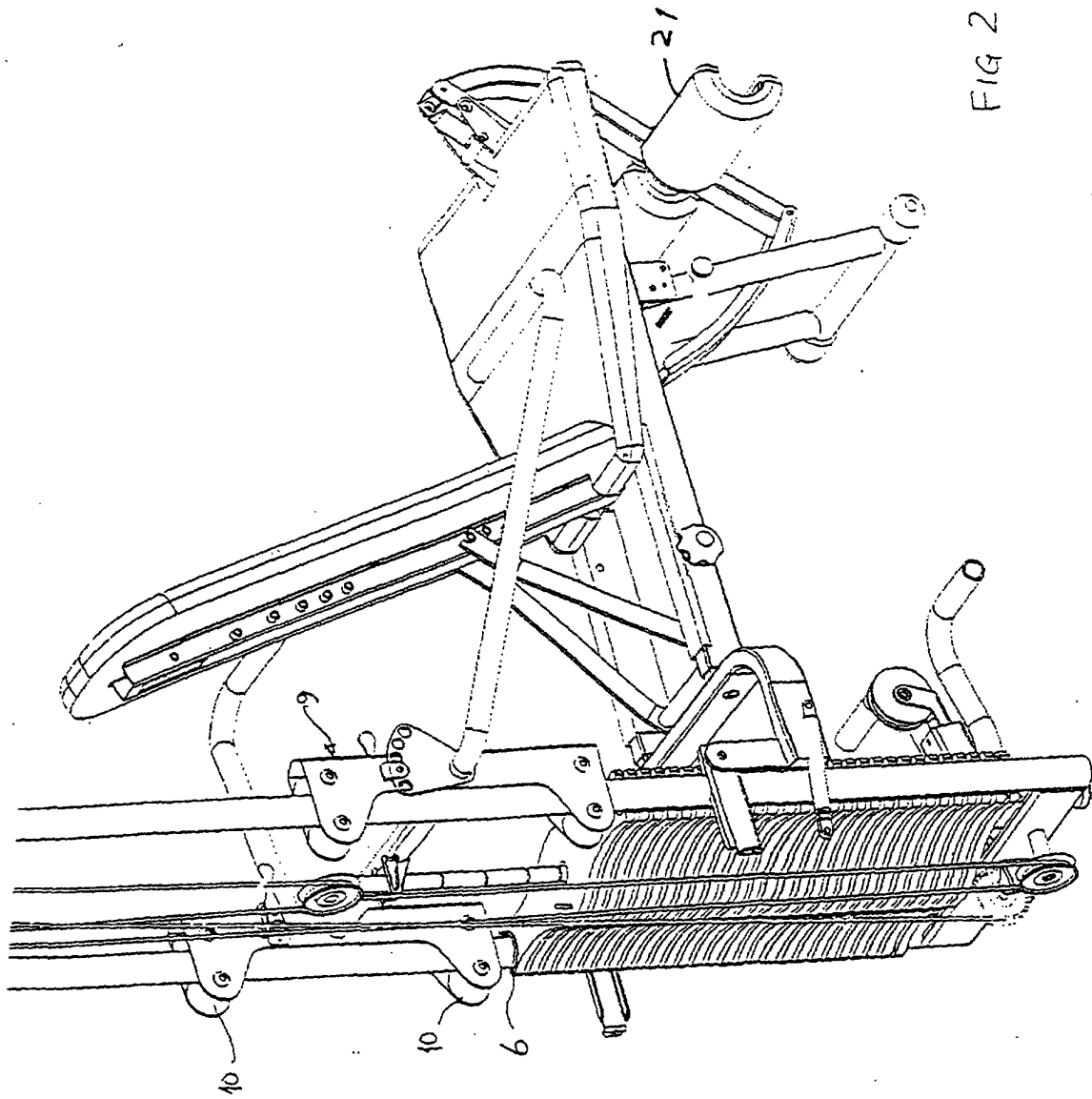
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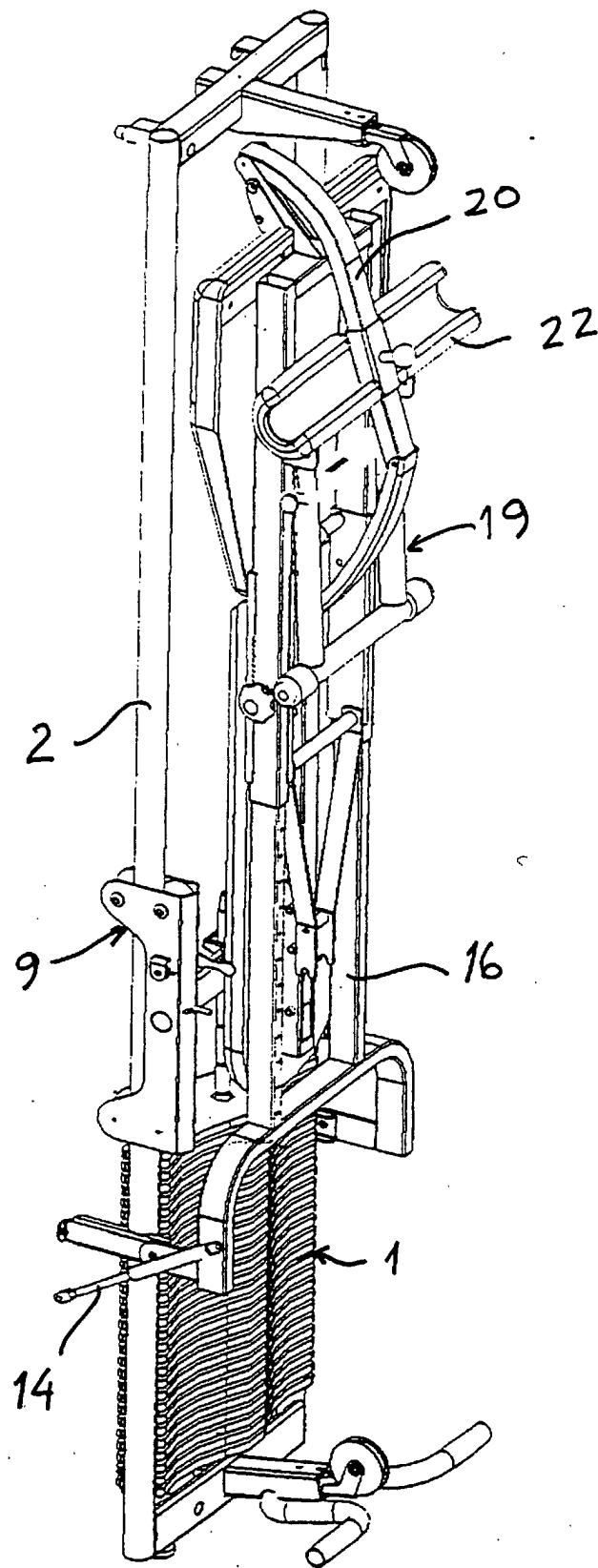


FIG 3

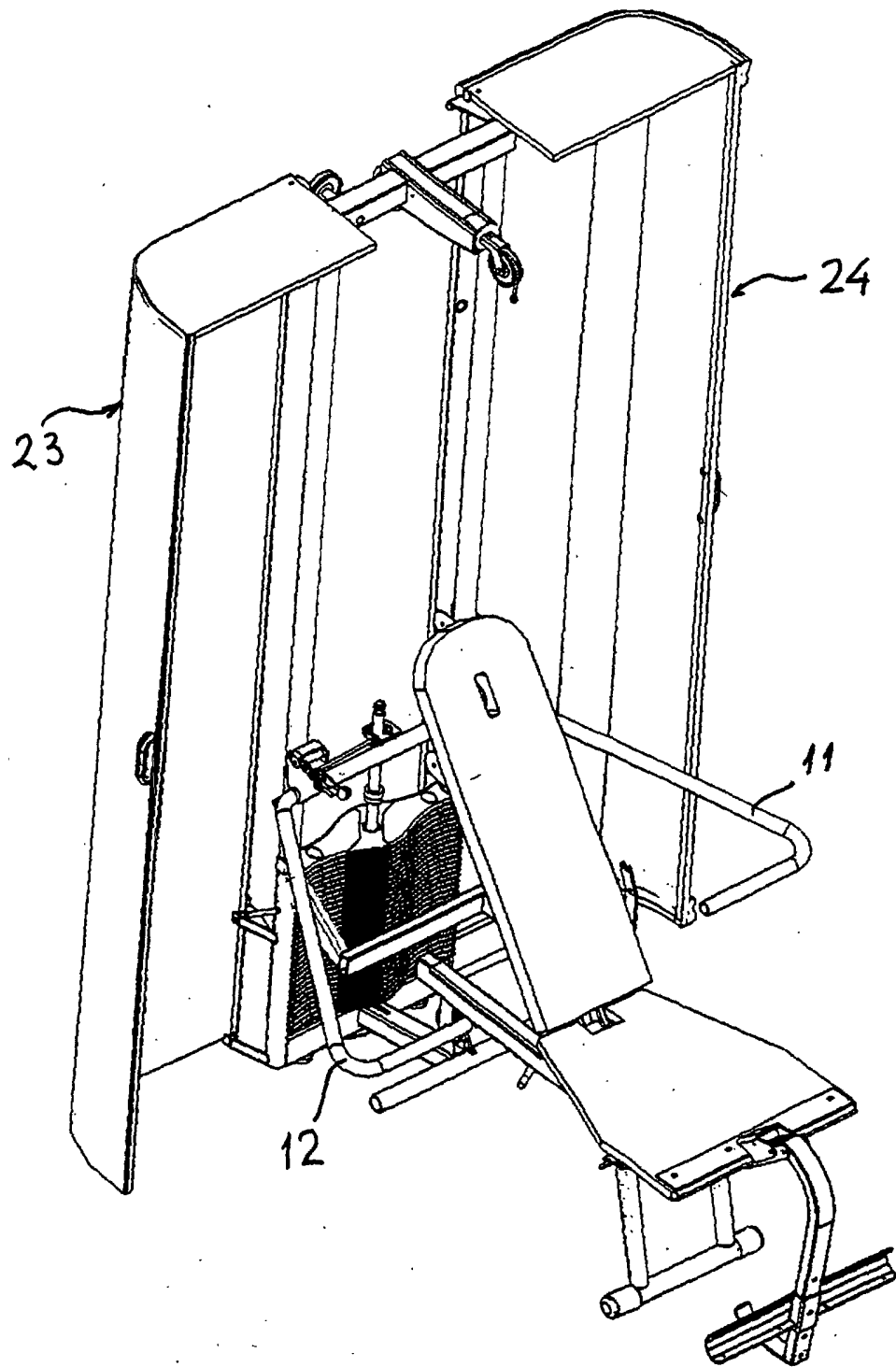
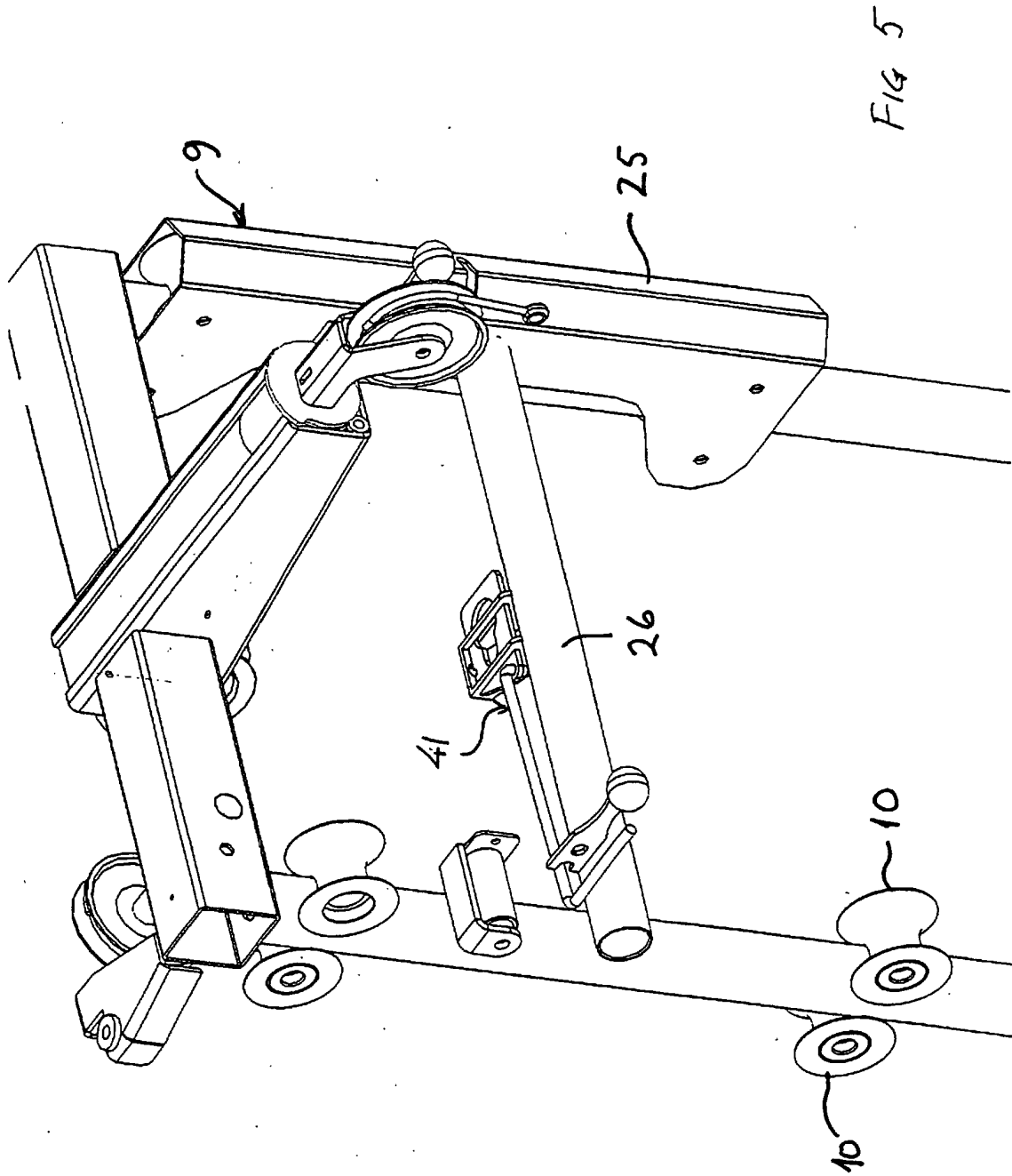


FIG 4.



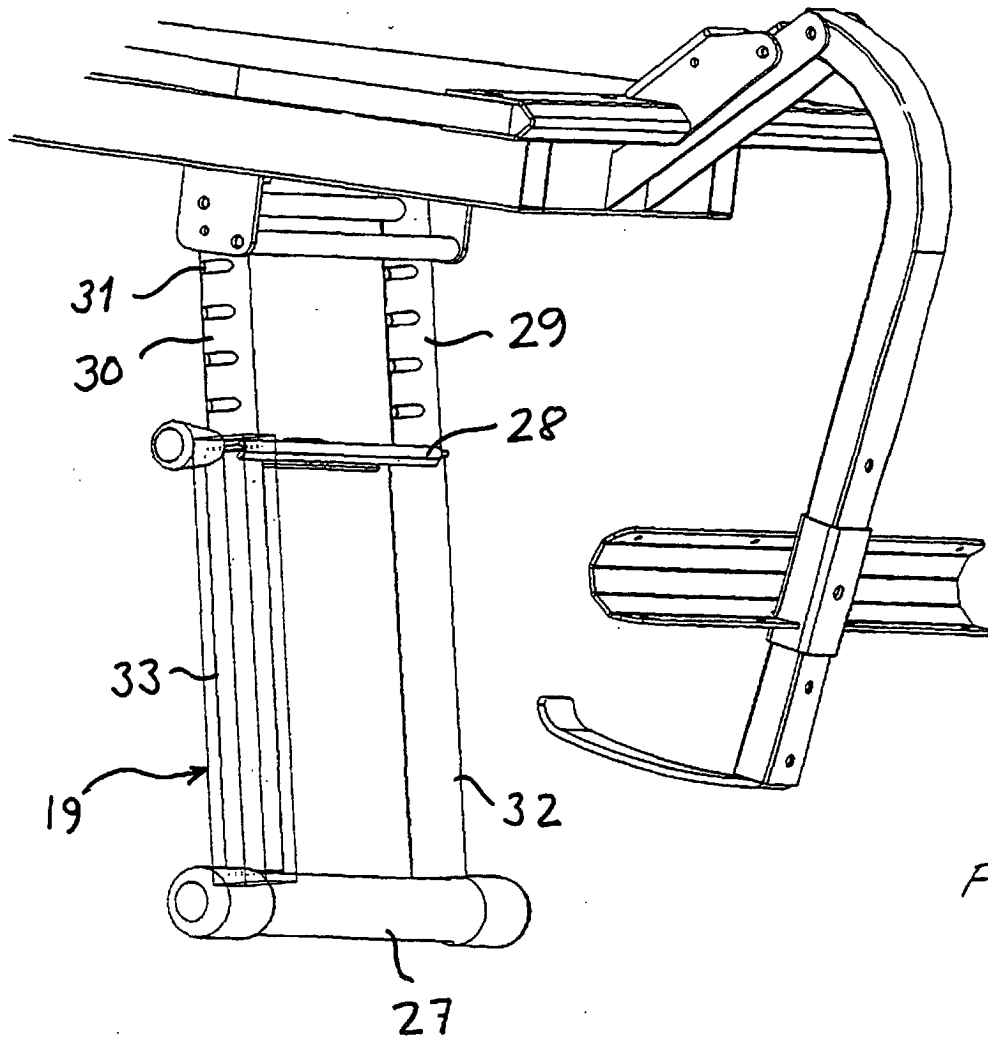
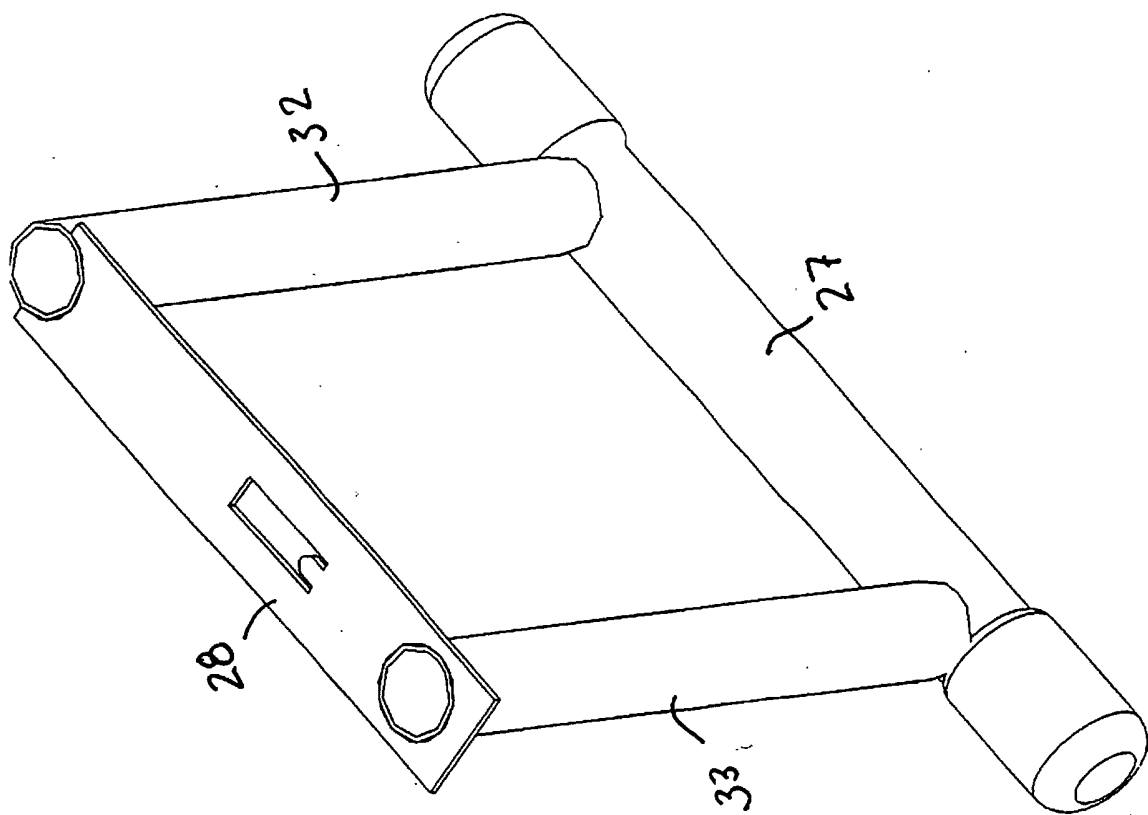


FIG 6



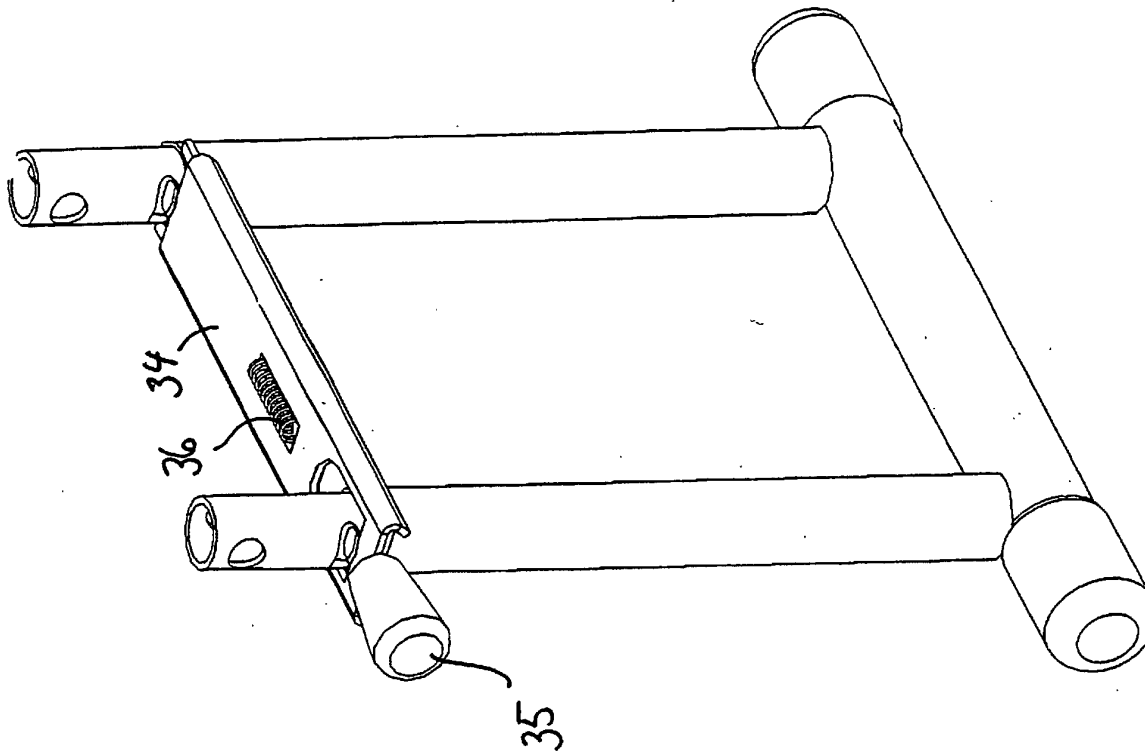


FIG 8

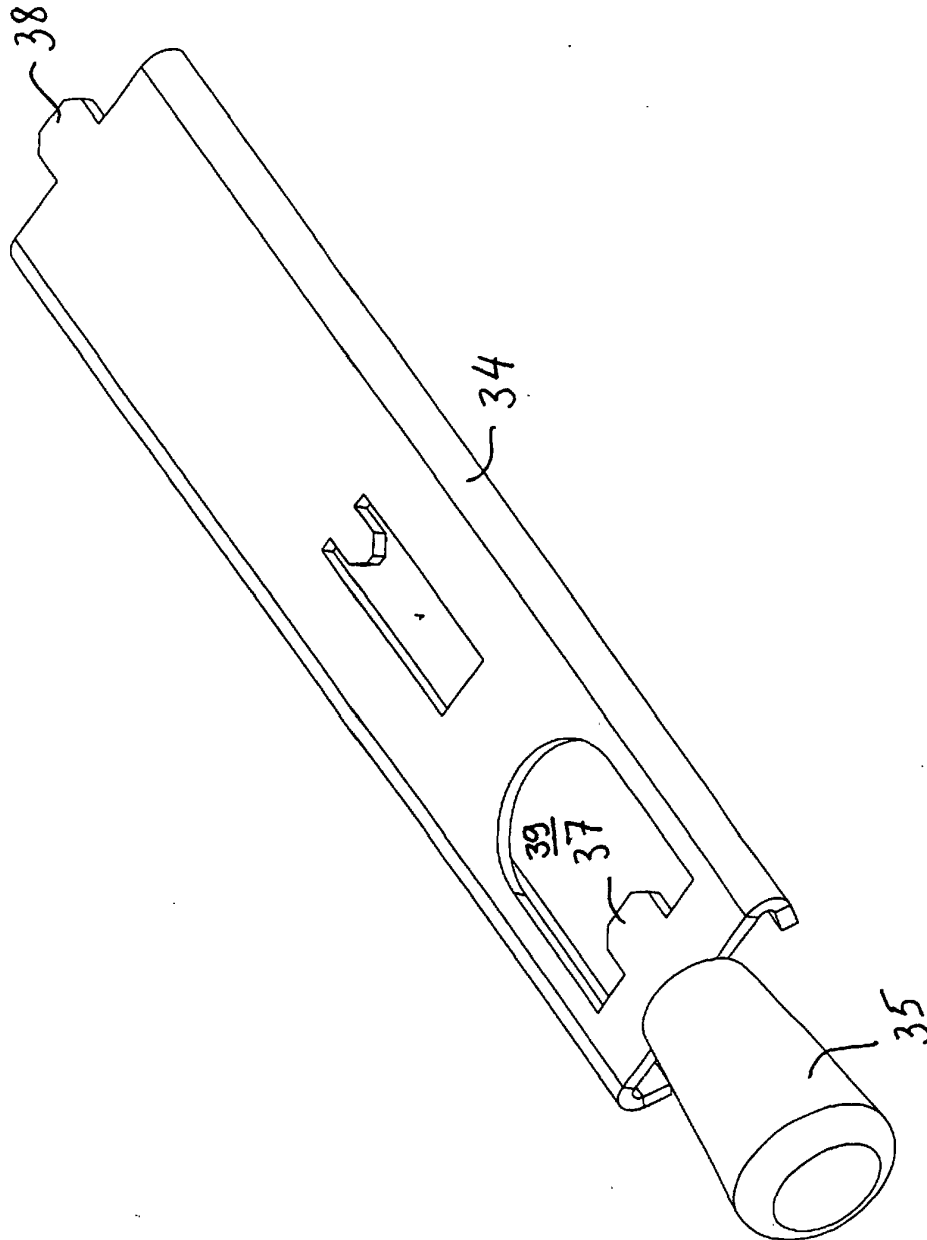


FIG 9

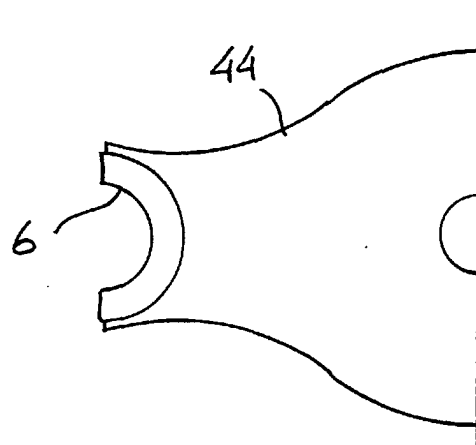


FIG 10

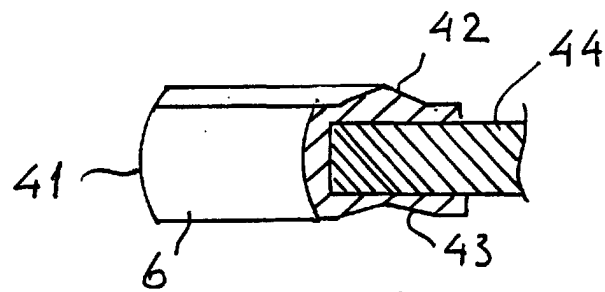


FIG 11