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(54) **DEMOUNTABLE MOBILITY DEVICE (ROLLATOR) FOR DISABLED PERSONS TO WALK UPRIGHT**

(57) A demountable adjustable mobility device (1, 31, 33) for disabled persons (23) is represented by this invention, which is easy to mount and demount to transport in the boot of a motor car. The mobility device (1, 31, 33) forces the disabled user or person (23) to walk in a straight upright posture with a maximum flexibility.

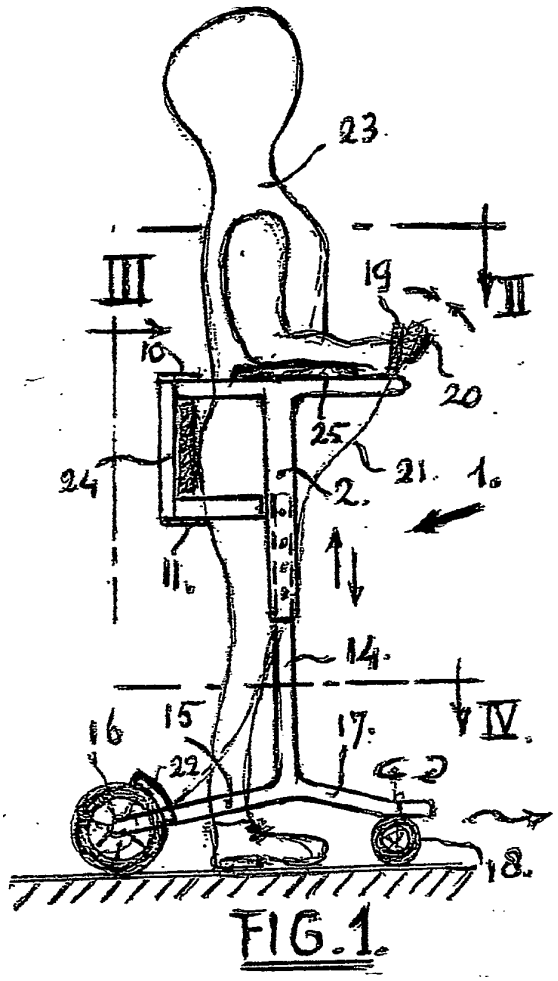

FIG.1

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Description

[0001] The present invention concerns two versions of a demountable mobility device, called "Sport Walker", which offers dorsal pelvis support which facilitates the user to walk upright. The "Sport Walker" gives the person more stability, complete free range of motion of both legs, an upright posture and excellent steering possibilities.

- The first version of the "Sport Walker" has forearm support and vertical upstanding handgrips. This version is meant for more severely disabled persons with gait problems because of e.g., Parkinson's disease or other underlying conditions, which hampers an unsupported gait.

- The second version of the "Sport Walker" can be used with straight arms, has upper-arm support and horizontal handgrips. This version is meant for younger persons who need a temporary walking aid in recovery or rehabilitation centres, for instance, after a recent orthopaedic surgery, an accident, a spinal cord injury, or otherwise.

[0002] The mobility device trains the user to walk in an upright position; the so-called "Sport Walker" should have the following characteristics:

- The mobility device gives support to the backside of a person's body;
- The gravity axis of the vertical device frame parts runs parallel and congruent with the body axis of the person;
- The mobility properties have to be superior to the usual walkers, which ensure that there are no obstruction parts in such a way that they restrict the free movement of the legs;
- The arms and hands control the excellent steering functions and give the person more grip on the traffic situation during use;
- The new design results in a short turning radius;
- The walker device makes the user look less disabled;
- The mobility device is easily demountable for transport in the boot of the car.

[0003] The above set of requirements cannot be delivered by the usual push rollator as when using this rollator, most people are forced to bend forwards. This posture is undesirable, because it makes the disabled person walk with a bent spine. So, the usual push rollator cannot deliver the above set of requirements. Therefore, when obstacles occur, they have less grip on the situation. This posture is undesirable because it makes the disabled person walk with a bent spine, reducing stability and deteriorate their posture, causing neck and back problems. Another drawback of the push rollator is, that it has a very great turning radius. For this reason, a new concept for a mobility device has been developed.

Background of the invention.

[0004] Such a mobility device is known from the American Patent US 2015/0216757, dated 06/08/2015, titled: "Erect Posture Mobility Device with low Turn Radius", Inventors: Richard Randal Powell and Johnna Dawn Powell USA.

[0005] This invention describes a mobility device (also called "Rollator"), wherein the weight of the user partly rests on the forearm and partly rests on the feet, which are walking on the pavement.

[0006] The not demountable device is accessed from the backside, as it is with the normal rollator. This construction is especially meant for the user to diminish his/her weight on his/her legs and get a more erect posture. Using the forearms as support means the user leans more forwards to the closed front side of said mobility device, which is a drawback when training the body physically. Another drawback is, that the forearms are relatively increasingly strained. Therefore, the user can only walk very short distances. Yet, another drawback is, that said mobility device is not foldable or directly demountable and that you would need a big car to transport this device to a certain training environment. Because of the short distance between the axis of the front wheels and the axis of the rear wheels, there is a need for extra care to prevent the user from falling. Due to all mentioned drawbacks, there is a need for a more specially developed and more inventive mobility device, which can be used to walk in a sporty posture over a longer distance, is more stable and gives a straight vertical or erect posture of the body during training.

[0007] Then there is a mobility apparatus known from the US Patent Application US 2010/0318005 A1, filed on June 8th, 2009, titled: "Apparatus to Facilitate Upright Posture and improved Gait Velocity in the Elderly and Methods for Making and Using Same"; Inventors: William E. Amounette, Houston, Texas USA; Kirk L. English, Houston, Texas USA.

[0008] This invention describes a mobility apparatus for a patient only to improve mobility. This is not a foldable apparatus or device for use outside the hospital, which is a drawback when taking it into your car to use somewhere else. Another drawback is, that the mobility apparatus has four swivel wheels, so movements in all directions are possible, which gives less or no stability to the disabled user. Especially older people with walking disabilities, because of, arthritis, heart failure, Parkinson's disease and other stability problems, will find this device unsuitable.

Object of the invention.

[0009] The aim of this invention is to overcome the aforementioned drawbacks and to provide a mobility device or apparatus for excellent vertical upright or erect body position for walking and training in an outdoor walking environment. This walking device should be foldable

or easily demountable to transport in a car, so the user can exercise longer and more relaxed in a desirable spot or environment.

[0010] Therefore, according to the invention, the mobility device is called: "The Sport Walker" and offers the user a more natural posture and a maximum freedom of movement of both legs, so it provides optimal exercise possibilities. It functions almost like an exoskeleton.

[0011] Furthermore, this walking device should be foldable or easy demountable to transport in a car, so the user can train his/her body longer and in a more relaxed way on a desirable spot or environment.

Summary of the invention.

[0012] The mobility device, called "The Sport Walker", is characterized in, that the mobility device is executed out of two separate parallel vertical frames, made of tubes, which are mutually slidable demountable coupled at the backside of the user by frame parts, which are rectangularly constructed over 90 degrees or as a complete back frame part, wherein the posts of said parallel frames are slidably adjustable in a vertical sense, wherein said posts are executed as a reversed Y-shaped post, wherein the backside tube of said reversed Y-shaped post has a steady wheel and the frontside tube has a swivel wheel, wherein the tubes of the frames and the frame parts are fabricated from bending stiff material.

[0013] The advantage is a mobility device, which is easy to mount and demount for transport in the boot of a car. The mobility device facilitates the user with a disability to walk relaxed in an upright or erect posture. He/she moves very flexible with the device of the invention (short turn radius). This mobility device provides the user more possibilities for sporty walks in all kinds of surroundings.

[0014] Furthermore, the mobility device, according to the invention, is characterized in that said mutually slidable mountable frame parts are coupled by separate tube parts, which are slidable inside the two to couple parallel vertical frames, wherein at one side said separate tube parts are coupled with a bolt and nut construction through bores and at the other side on top of the bore a welded nut and through this a wing bolt.

[0015] The advantage is very easy and fast mounting and demounting procedure of the mobility device. Also, an accurate width adjustment for the user is possible, because in said frame parts there are more bore holes in horizontal sense.

[0016] Then the mobility device is further developed in such a way, that the two steady wheels are provided with a brake, slipper and/or a speed control mechanism.

[0017] The advantages are a very stable and safe use of the mobility device according to the invention.

[0018] Then the mobility device is further developed in such a way, that at the end of the top of said vertical frames an adjustable (brake, adjust) lever is placed for the relaxed steering of the mechanisms on steady wheels.

[0019] The advantage is, that said lever can be adjusted into a position, which the user finds the most relaxing.

[0020] Furthermore, the mobility device is developed in such a way, that the tube with the steady wheel and the tube with the swivel wheel are slightly horizontally bent towards the outside over an angle alpha (α), wherein (α) is about 10 to 15 degrees.

[0021] The advantage is, that the feet of the user do not collide with the wheels of the mobility device according to the invention.

[0022] Then the mobility device according to the invention can be made from different bending stiff materials such as steel, aluminium or a synthetic tube material.

[0023] The advantage is, that an attractive design can be developed due to the modulus of elasticity of mentioned materials. This also counts for the maintenance of the mobility device.

Short description of the drawing.

[0024] The different embodiments of the present invention will now be described by way of example with reference to the accompanying drawing, in which:

- Figure 1 shows a side view of the first embodiment of the mobility device according to the invention;
- Figure 2 shows a top view of the mobility device over the line II - II;
- Figure 3 shows a back view of the mobility device with indication of the coupling of the two vertical frames over the line III - III;
- Figure 4 shows a top view of the mobility device with the angle alpha (a) spreading of the wheel tubes over the line IV - IV;
- Figure 5A, 5B show in detail the coupling of the halves of the two vertical frames of the mobility device;
- Figure 6 shows a side view of a second shortened embodiment with a horizontal handgrip on the mobility device;
- Figure 7 shows a side view of a third embodiment of the mobility device with a demountable back part;
- Figure 8 shows the front view of said demountable back part of the mobility device of figure 7;
- Figure 9 shows a top view of the demountable back part of the mobility device of figure 7;
- Figure 10 shows a side view of the mounting of said back part with the two vertical frames of figure 7.

Detailed description.

[0025] Figure 1 shows a side view of the first and preferred embodiment 1 of the mobility device, figure 6 shows a second embodiment 31 and figure 7 shows a third embodiment 33 of the mobility device according to the invention. The mobility device 1 includes two in top views L-shaped separate parallel vertical frames 2, 3,

which are coupled together with a slidable internal tube 26, fixed with bolt/nut and wing-bolt in a welded nut construction 4, 5, as indicated in the figures 5A and 5B. The rectangular tubes 6, 7 and 8, 9 are connected in this way. The angular points are further stiffened with triangular plates 10, 11, 12, 13.

[0026] The vertical posts 14 of the vertical frames 2, 3, 31, 33 are adjustable in various heights according to the leg length of the user 23. Then, post 14 has a reversed Y-shape with at the backside tube 15 with a steady wheel 16 and at the frontside a tube 17 with a swivel wheel 18. Said tubes 15, 17 are horizontally bent under an angle alpha (α) of 10 to 15 degrees outwards to prevent collision with the feet of the user 23. See the figures 1, 2, 3, 4 and 5A and 5B.

[0027] At the top of the vertical frames 2, 3 adjustable handgrips 19 with handbrake etc. 20 are connected with a cable 21 to the brake, slip, and/or speed control mechanism 22. So, the user 23 can walk safely with the mobility devices 1, 31, 33 (See Figures 1, 6 and 7). Furthermore, to make walking with the mobility devices 1, 31, 33 (See figures 1, 6 and 7) with more comfort for the user 23, back cushions 24 and 38 are provided. In figure 5B, the coupling construction is shown more detailed at a mentioned larger scale.

[0028] The tube parts 6, 7 and 8, 9 with more bore holes in the vertical frames 2, 3 have to be connected with a bending stiff and shearing slidable connection tube 26. These tubes 26 are fixed with a bolt 27 with a pin 4 and a nut 28 at the tube parts 6 and 7 and with a wing-bolt 30 with a pin 5 and a welded nut 29 at the tube parts 8 and 9.

[0029] Figure 6 shows mentioned second embodiment 31 of the mobility device and has horizontal handgrips 32 and an elbow-cushion 38. Furthermore, the same parts or elements have the same numbers.

[0030] Figure 7 shows mentioned third embodiment 33 of the mobility device and has a separate back frame part 34. This back frame part 34 can be mounted with bolts and nuts 35 to the separate vertical flat frame parts 39 and 40 with the same frame posts 14. The angular angle points are strengthened with triangular plates 36 and 37 in order to form a bending stiff walking frame. Also, the same parts have the same numbers.

[0031] However, it is obvious that modifications and/additions to the afore mentioned mobility devices can be made, but these shall remain within the field and scope of the invention.

Claims

1. Mobility device, also called walker, mobility walking device, rollator, Zimmer frame etc. for persons with disabilities, to mostly support their walking activities outside their homes, wherein said mobility devices are built-up of two parallel mutually connected frames on wheels, a handle bar with hand grips, a brake and sometimes an element for holding bags, wherein normally two of said wheels are swivel wheels for the for the turn radius of the mobility device for the people using them, **characterized in that** the mobility device (1, 31, 33) is made from two separate parallel vertical frames (2, 3), which mutually slidable demountable frames (2, 3) are coupled at the backside over an angle of 90 degrees rectangularly constructed frame parts (6, 7; 8, 9) or as a complete back frame part (34), wherein the posts of said parallel frame parts (2,3; 14) are vertically slidable adjustable, wherein said posts are executed as a reversed Y-shaped post (14) with a backside tube (15) with a steady wheel (16) and at the open frontside with a tube (17) with a swivel wheel (18), wherein the tubes of the frames and frame parts are made from a bending stiff material.

2. Mobility device as in claim 1, **wherein** said mutually slidable demountable frame parts (6, 7; 8, 9) are coupled by tube parts (26), which slide inside to couple said tube parts (6, 7; 8, 9), wherein the fixing is executed by wing-bolts (30) through bores with on top of the frame parts (8, 9) a welded nut (29), wherein at the other tube parts (6, 7) the fixing is executed with a bolt (27) and nut (28) construction.

3. Mobility device as in claim 1, **wherein** the two steady back wheels (16) are applied with a mechanism (22) executed as a brake.

4. Mobility device as in claim 3, **wherein** said brake mechanism (22) also is executed as a slipper mechanism.

5. Mobility device as in claim 3, **wherein** said brake mechanism (22) also is executed as a speed control mechanism

6. Mobility device as in claim 1 and 3, **wherein** at the end of the top of said vertical frames (2, 3) an adjustable handbrake (20) is placed for relaxed steering of said brake mechanism (22) on the steady wheels (16).

7. Mobility device as in claim 1, **wherein** said tube (17) with the swivel wheel (18) and the tube (15) with the steady wheel (16) are forming an angle alpha (α) outwardly, wherein said angle alpha (α) is about 10 to 15 degrees.

8. Mobility device as in claim 1, **wherein** said vertical frames (2, 3, 14) and the separate back part (34) are made of steel.

9. Mobility device as in claim 1, **wherein** said vertical frames (2, 3, 14) and the separate frame part (34) are made of aluminium.

10. Mobility device as in claim 1, **wherein** said vertical frames (2, 3, 14) and the separate frame part (34) are made of synthetic material.

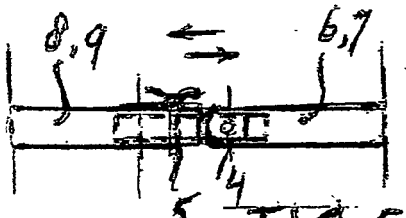


FIG.5A.

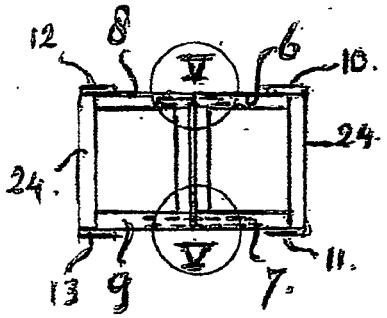


FIG.3.

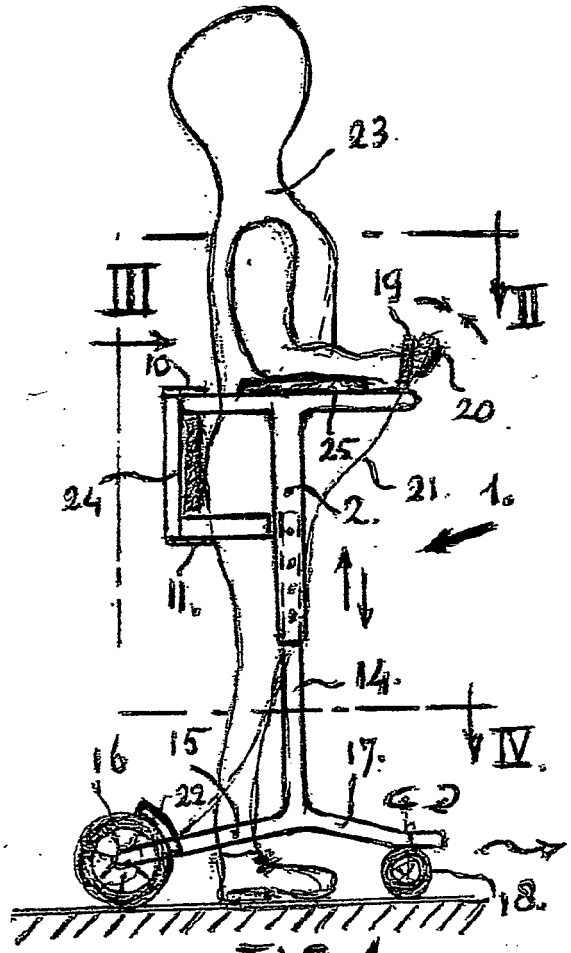


FIG.1.

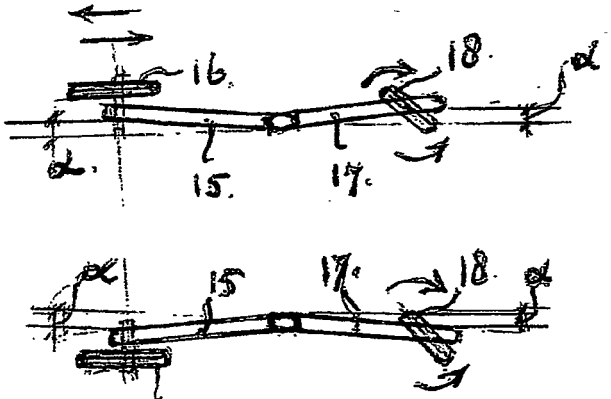


FIG.4.

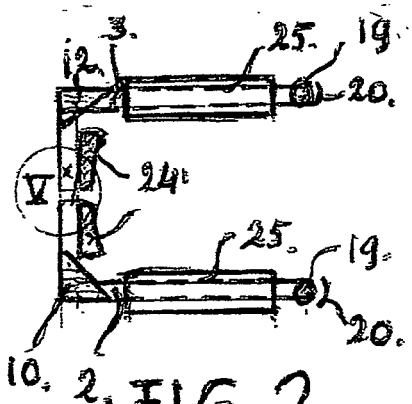


FIG.2.

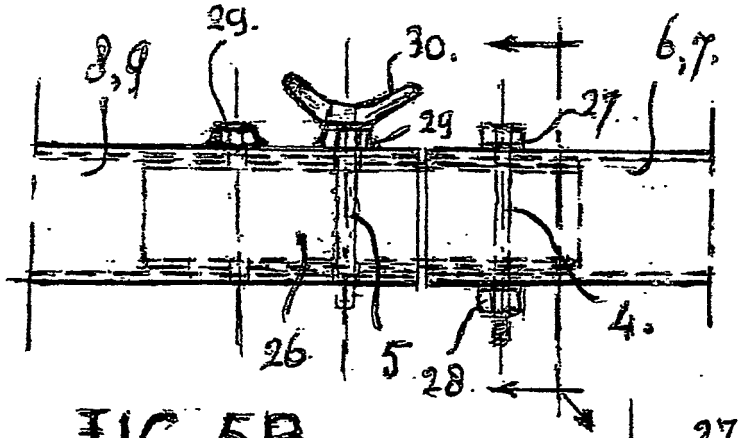
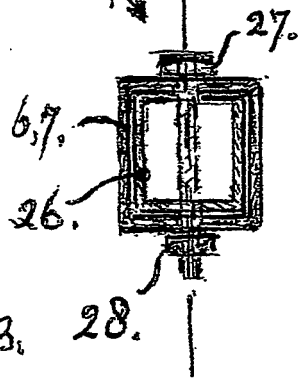

8,9
29.
30.
6,7.
29
27
26
5
28
4.

FIG.5B.


27.
6,7.
26.
28.

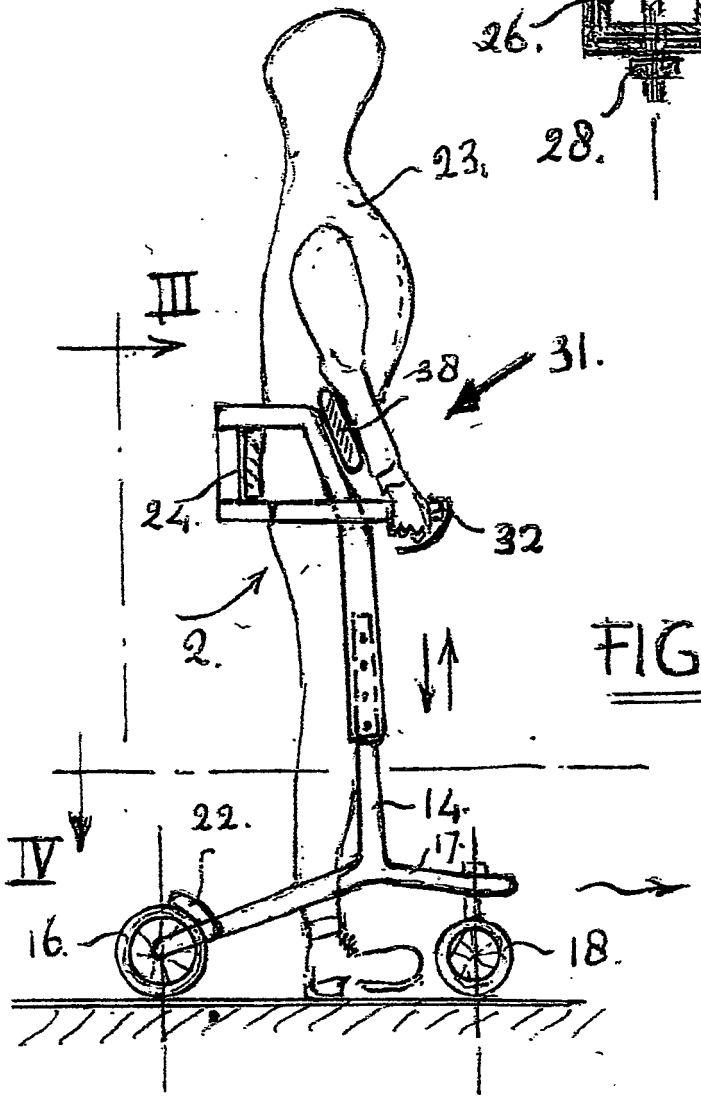

23.
III
38
31.
24.
32
2.
14.
22.
17.
IV
16.
18.

FIG. 6.

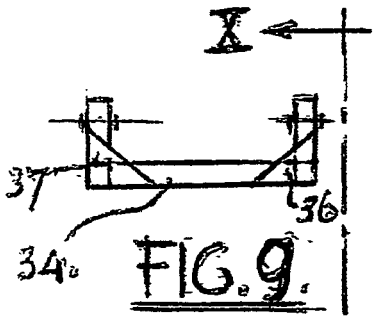


FIG. 9.

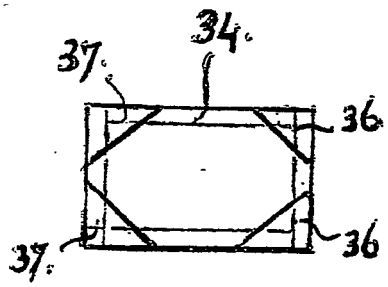


FIG. 8.

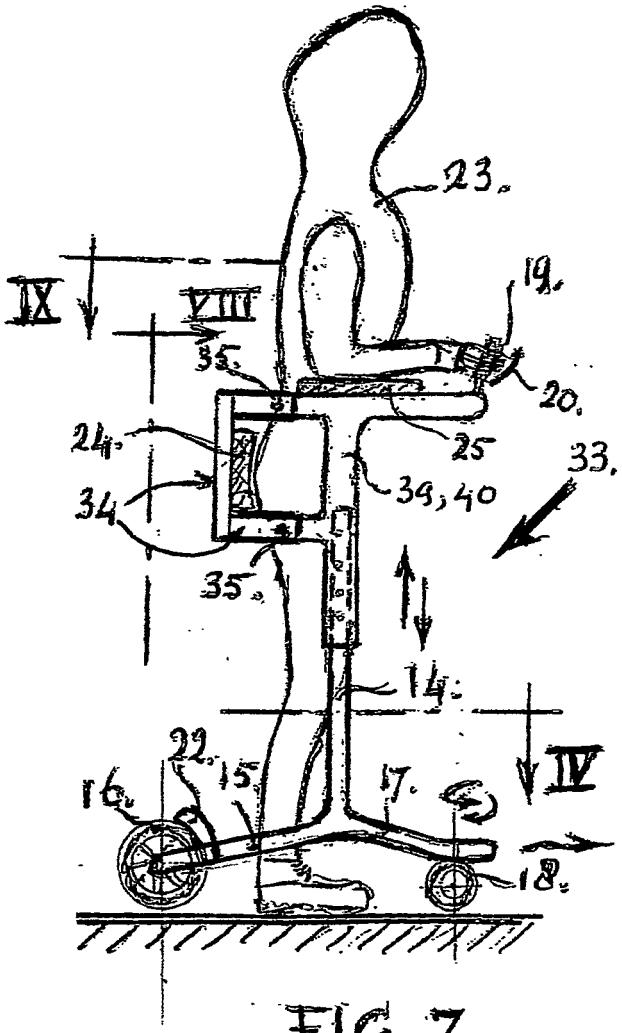


FIG. 7.

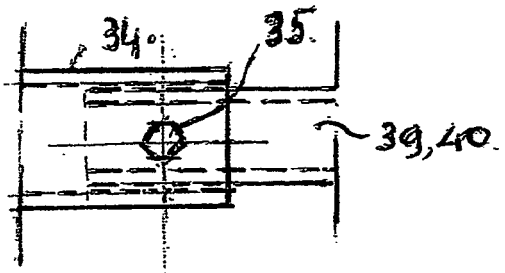


FIG. 10.

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EUROPEAN SEARCH REPORT

Application Number
EP 21 07 5008

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 January 2022	Shmonin, Vladimir

CATEGORY OF CITED DOCUMENTS

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