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# DESCRIPTION

[0001] The present patent application relates to a walker.

[0002] As it is known, people unable to walk autonomously use a device designed to support them, which is normally defined as "walker". The walker allows the patient to keep his feet on the ground, in such a way to walk autonomously without the help of other people.

[0003] Moreover, the walker is an excellent device for the training and rehabilitation of patients who have suffered traumas to the lower limbs.

[0004] Generally, a walker comprising a cart mounted on swivelling wheels. Vertical rods are arranged on the cart to support means used to support the patient. The said support means can consist, for instance, in one or more belts that surround the patient's waist and/or a handlebar where the patient can place his hands.

[0005] Telescopic systems are known in order to adjust the support means to the correct height by making the vertical rods slide according to the height of the patient.

[0006] However, such a type of walker according to the known technique is impaired by a great drawback caused by the excessive height determined by the presence of the vertical rods. This results in difficult transportation, handling and storage of the walker when it is not used by the patient.

[0007] US 4 359 242 discloses a collapsible walker jumper according the preamble of claim 1.

[0008] US 5 813 948 discloses a walker comprising an adjustable support **frame**.

[0009] AU 688640 discloses a walker comprising adjustable arms, wherein the space between the arms can be varied.

[0010] FR 2 773 989 discloses lifting aid for a handicapped person, enabling person to be lifted to supported standing position.

[0011] US 4 211 26 discloses a walker including a support frame mounted on rear wheels.

[0012] JP2006 193240A discloses a table moving device comprising a lower four bar linkage and an upper four bar linkage connected each other by a connection rod. Each four bar linkage comprises two rods parallel and separated each other.

[0013] The purpose of the present invention is to eliminate the inconveniences of the known technique, by devising a walker that takes a space with reduced height when it is not used by the patient.

**[0014]** Another purpose of the present invention is to devise a versatile, practical and easy-to-use walker.

**[0015]** These purposes are achieved according to the present invention with the features are claimed in the independent claim 1.

**[0016]** Advantageous embodiments of the invention are disclosed in the dependent claims.

**[0017]** The walker of the invention comprises a base frame supported by wheels and support rods mounted on the said base frame to support, at a suitable height, support means design to support the patient during walking.

**[0018]** The support rods are hinged mutually and to the base frame in such a way to go from the operating position, in which the support means are at a suitable height to support the patient, to a minimum volume position, in which the support means are near the base frame.

**[0019]** The advantages of the walker according to the present invention are clear. In fact, the system of hinged rods allows for closing the walker in minimum volume configuration to provide easy handling, transportation and storage. Moreover, said system of hinged rods allows for the fine adjustment of the support means in order to adjust the walker to patients with different height.

**[0020]** Additional characteristics of the invention will be clearer from the following detailed description, which refers to merely illustrative, not limiting embodiments, illustrated in the enclosed drawings, wherein:

Fig. 1 is a side elevation view of a first embodiment of the push-walker according to the invention, shown in operating position;

Fig. 1A is an axial sectional view of the walker of Fig. 1 in the axes of the lower and upper arms;

Fig. 2 is a top view of the walker of Fig. 1;

Fig. 3 is a rear view of the walker of Fig. 1;

Fig. 4 is the same as Fig. 1, except in that it shows the walker in operating position at a lower height than Fig. 1;

Fig. 5 is a view of the walker of Fig. 1 in minimum volume position;

Fig. 6 is a side view of a second embodiment of a pull-walker according to the present invention; and

Fig. 7 is a top view of the walker of Fig. 6.

**[0021]** With reference to Figs. 1-5, a first embodiment of the walker according to the present invention is disclosed, which is generally indicated with numeral (1).

**[0022]** The walker (1) comprises a base frame (2) with basically U-shape that extends on a horizontal plane. The base frame (2) is composed of two cross-pieces (20) connected by a slightly curved transversal rod (21).

**[0023]** Four swivelling wheels (22) with brakes (23) are mounted at the ends of the cross-pieces (20) of the base frame (2). The base frame (2) extends on a basically horizontal plane, when the wheels (22) rest on the ground.

**[0024]** The end of a first support rod (3) is hinged in the central part of each cross-piece (20) by means of a hinge (30). The hinge (30) is shaped as a cylindrical articulation with orthogonal axis to the axis of the cross-piece (20) and extends on a horizontal plane.

**[0025]** The first support rod (3) can rotate around the hinge (30) with respect to the cross-piece (20) by an angle ( $\alpha$ ) that varies from  $0^\circ$  to  $180^\circ$ . Preferably, the hinge (30) is regulated in such a way that the angle ( $\alpha$ ) varies from  $0^\circ$  to  $80^\circ$ . The first support rod (3) can go from a minimum volume position ( $\alpha = 0^\circ$ ), which is basically parallel to the cross-piece (20) (Fig. 5), to a maximum height position ( $\alpha = 80^\circ$ ), which is almost orthogonal to the cross-piece (20) (Fig. 1).

**[0026]** A second support rod (4) is connected at the upper end of each of the first support rods (3) by means of a mechanism (40). As shown in Fig. 1A, the first rod (3) and the second rod (4) respectively comprise an external pipe (32, 42) and an internal pipe (33, 43) arranged inside the external pipe.

**[0027]** The internal pipes (33, 43) are connected to corresponding elliptical shells (34, 44) that act as joints. The external pipes (32, 42) are mutually connected by means of a connection rod (9) with the ends hinged to the external pipes.

**[0028]** Because of the mechanism (40), the first support rod (3) and the second support rod (4) can simultaneously rotate, generating the vertical movement of the upper end of the second rod (4). An angle ( $\beta$ ) that can vary from  $0^\circ$  to  $180^\circ$  is generated between the two rods (3, 4). Preferably, the mechanism (40) is adjusted in such a way that the angle ( $\alpha$ ) varies from  $0^\circ$  to  $160^\circ$ . The support rods (3, 4) can go from a minimum volume position ( $\beta = 0^\circ$ ), in which the second rod (4) is almost overlapped to the first rod (3) (Fig. 5), to a maximum height position ( $\beta = 160^\circ$ ), in which the second rod (4) is an extension of the first rod (3) (Fig. 1).

**[0029]** Stabilisation means (5) are provided between the two rods to stabilise the rotation of the second rod (4) with respect to the first rod (3). The stabilisation means (5) can comprise a cylinder - piston assembly, in which the cylinder (50) is hinged in a central portion of the second rod (4) and the piston (51) is hinged in the upper portion of the first rod (3).

**[0030]** The stabilisation means (5) also act as adjusting and lock means. To adjust the height of the walker and lock the two rods (3, 4) in position, the user can act on the cylinder-piston assembly (5).

**[0031]** An upper frame (6) is hinged with corresponding hinges (60) to the upper end of the two support rods (4). The upper frame (6) has a U-shape and acts as connection element of the two upper support rods (4). The upper frame (6) is provided with two padded rings (7, 8) that can be opened and locked, which are shaped as a C in the plan (Fig. 2) and designed to surround the patient's waist. The walker (1) shown in Figs. 1 - 5 is a back push walker, because it is dragged by the patient.

**[0032]** Preferably, each upper hinge (60) must be positioned in a vertical axis passing through the corresponding lower hinge (30). The mechanism (40) ensures that the upper hinge (60) is positioned on the same vertical axis as the lower hinge (30) and makes a vertical movement.

**[0033]** The lower support rods (3) and the upper support rods (4) form a knee or compass mechanism and can be easily adjusted in a maximum height position (Fig. 1), in a plurality of intermediate height positions (Fig. 4) and in a minimum volume position (Fig. 5) for easy handling, transport and storage.

**[0034]** Figs. 6 and 7 illustrate a pull-walker (100) according to a second embodiment of the invention, in which the same elements as the ones illustrated above are indicated with the same reference numerals, omitting the detailed description.

**[0035]** The walker (100) differs from the walker (1) of the first embodiment only in the fact that, instead of being provided with padded rings, the upper frame (6) that connects the two upper rods (4) is provided with a handlebar (107) designed to be grabbed by the patient to pull the walker. In fact, the walker (100) is a pull-walker.

**[0036]** In this case the two front wheels (122) of the walker have a larger diameter than the back wheels (22) and are not swivelling wheels.

**[0037]** Numerous variations and modifications can be made to the present embodiments of the invention by an expert of the field, while still falling within the scope of the invention as claimed in the enclosed claims.

## REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all

liability in this regard.

**Patent documents cited in the description**

- US4359242A [0007]
- US5813948A [0008]
- AU688640 [0009]
- FR2773989 [0010]
- US421126A [0011]
- JP2006193240A [0012]

**P a t e n t k r a v**

1. Gangstativ (1; 100) omfattende en basisramme (2), der er understøttet på  
hjul (22; 122), og støttestænger (3, 4), der er monteret på basisrammen (2), til  
5 understøtning i en passende højde af understøtningsmidler (7, 8; 107), der er  
udformet til at understøtte patienten under gang, hvor støttestængerne (3, 4)  
er hængslet til hinanden og til basisrammen (2), på en sådan måde, at de kan  
gå fra en betjeningsposition, i hvilken understøtningsmidlerne (7, 8; 107) er i  
10 en passende højde til at understøtte patienten, til en minimumsvolumenposi-  
tion, i hvilken understøtningsmidlerne (7, 8; 107) er tæt på basisrammen (2),  
hvor gangstativet omfatter en øvre ramme (6), hvilken øvre ramme er forsynet  
med understøtningsmidlerne,

hvor støttestængerne omfatter mindst en nedre stang (3), der er hængslet ved  
hjælp af et nedre hængsel (30) til basisrammen (2), og mindst en øvre stang  
15 (4),

**kendetegnet ved at**

den nedre stang (3) omfatter et udvendigt rør (32), i hvilket der er anbragt et  
indvendigt rør (33), og den øvre stang (4) omfatter et udvendigt rør (42), i hvil-  
ket der er anbragt et indvendigt rør (43),

20 hvor

en nedre ende af det indvendige rør (33) af den nedre stang er hængslet ved  
hjælp af det nedre hængsel til basisrammen (2), og den anden ende af det  
indvendige rør (33) er forbundet med ellipseformede skaller (34, 44),

25 en nedre ende af det udvendige rør (32) af den nedre stang er hængslet ved  
hjælp af det nedre hængsel til basisrammen (2), og det udvendige rør (32) af  
den nedre stang er forbundet med de ellipseformede skaller (34, 44);

hvor

30 en øvre ende af det indvendige rør (43) af den øvre stang er hængslet ved  
hjælp af et øvre hængsel (60) til den øvre ramme (6), og den anden ende af  
det indvendige rør (43) af den øvre stang er forbundet med de ellipseformede  
skaller (34, 44),

35 en øvre ende af det udvendige rør (42) af den øvre stang er hængslet ved  
hjælp af det øvre hængsel (60) til den øvre ramme (6), og den anden ende af  
det udvendige rør (42) af den øvre stang er forbundet med de ellipseformede  
skaller (34, 44),

hvor

de udvendige rør (32, 42) af den nedre stang og øvre stang er forbundet med hinanden ved hjælp af en forbindelsesstang (9), idet enderne af forbindelsesstangen (9) er hængslet til de udvendige rør (32, 42).

5

**2.** Gangstativ (1; 100) ifølge krav 1, **kendetegnet ved at** det nedre hængsel (30) omfatter indstillings- og låsemidler til indstilling af hældningsvinklen ( $\alpha$ ) mellem rammen (2) og den nedre stang (3).

10

**3.** Gangstativ (1; 100) ifølge et hvilket som helst af kravene 1 eller 2, **kendetegnet ved at** det omfatter låsemidler (5) mellem den nedre stang (3) og den øvre stang (4) til låsning af de to stænger i position.

15

**4.** Gangstativ (1; 100) ifølge krav 3, **kendetegnet ved at** låsemidlerne (5) omfatter en anordning bestående af en cylinder (50) og et stempel (51).

20

**5.** Gangstativ (1; 100) ifølge et hvilket som helst af de foregående krav, **kendetegnet ved at** basisrammen (2) er i det væsentlige U-formet og omfatter to tværstykker (20), der er forbundet af en tværgående stang (21), og **ved at** de tilsvarende nedre stænger (3) er hængslet i den centrale del af tværstykkerne (20).

25

**6.** Gangstativ (1; 100) ifølge krav 5, **kendetegnet ved at** den øvre ramme (6) er i det væsentlige U-formet.

30

**7.** Gangstativ (1) ifølge et hvilket som helst af de ovenstående krav, **kendetegnet ved at** det er et skubbe-gangstativ, og understøtningsmidlerne (6, 7) omfatter mindst en polstret ring, der kan åbnes, og som er udformet til at omgive patientens talje.

**8.** Gangstativ (100) ifølge et hvilket som helst af kravene 1 til 5, **kendetegnet ved at** det er et trække-gangstativ, og understøtningsmidlerne (107) omfatter en styrestang, der er udformet til at blive grebet om af patienten.

## DRAWINGS

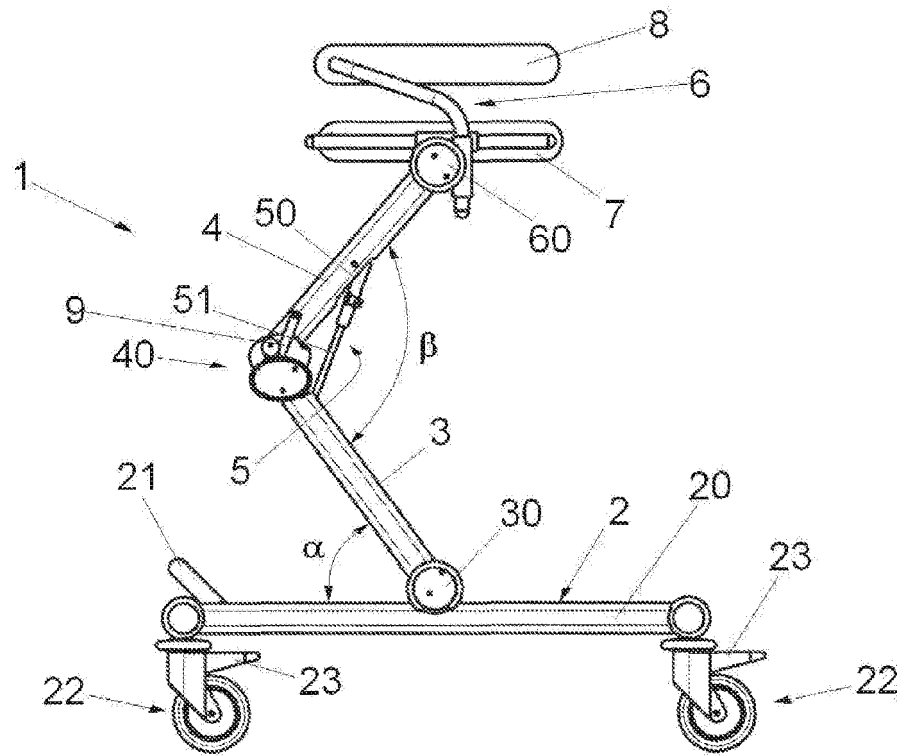


FIG. 1

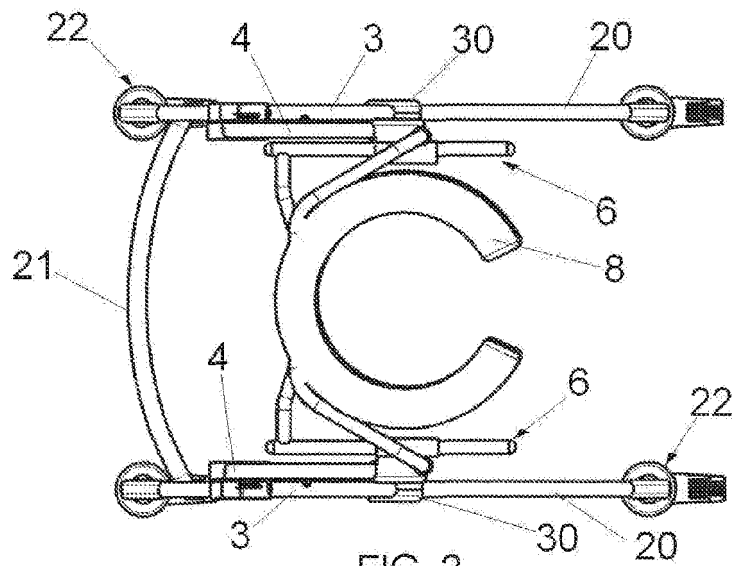


FIG. 2

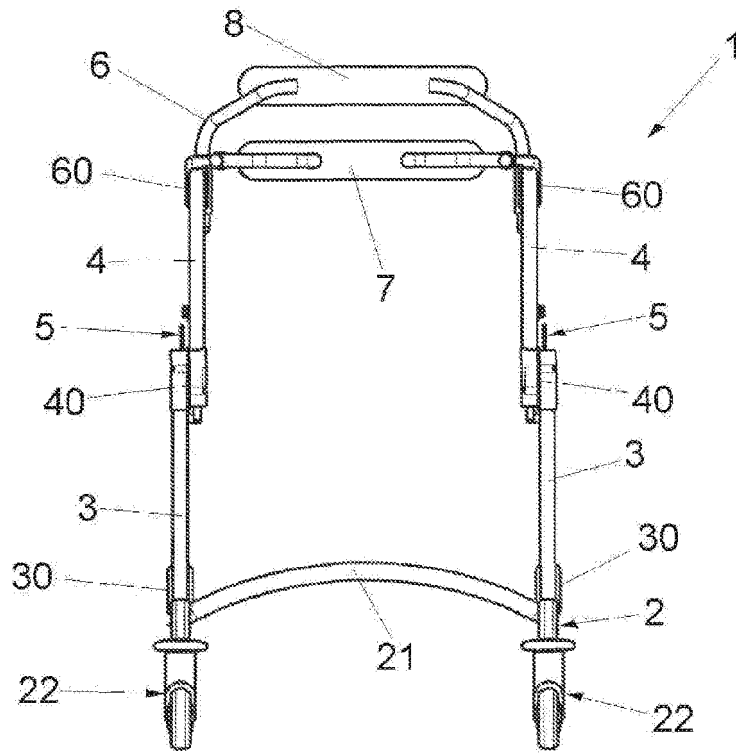


FIG. 3

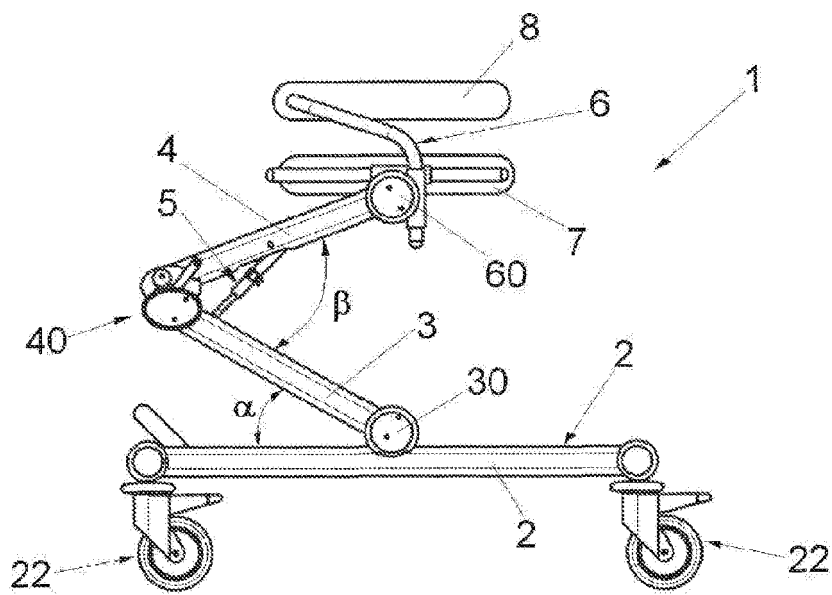
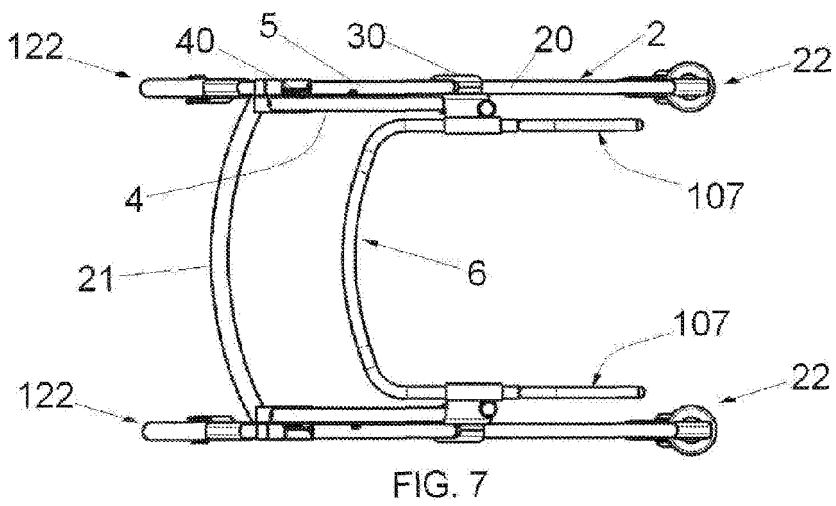
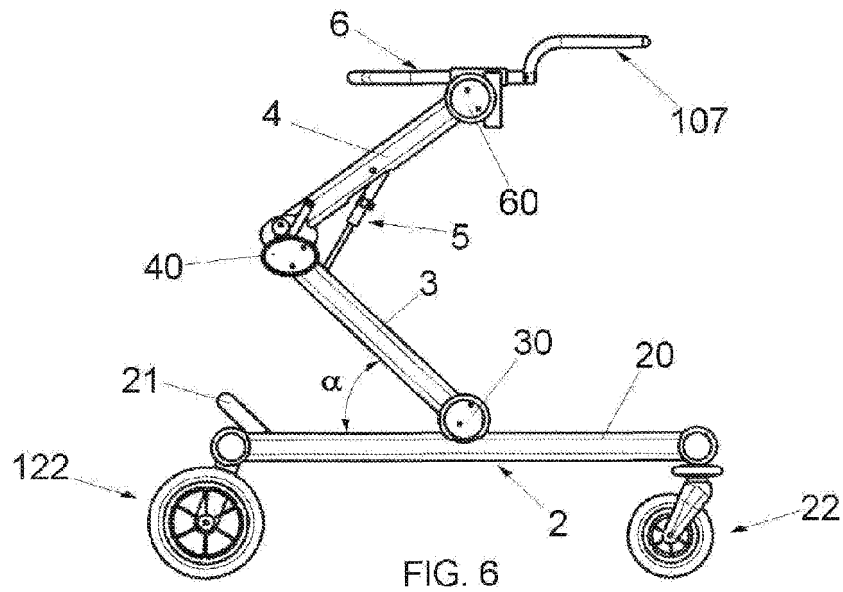
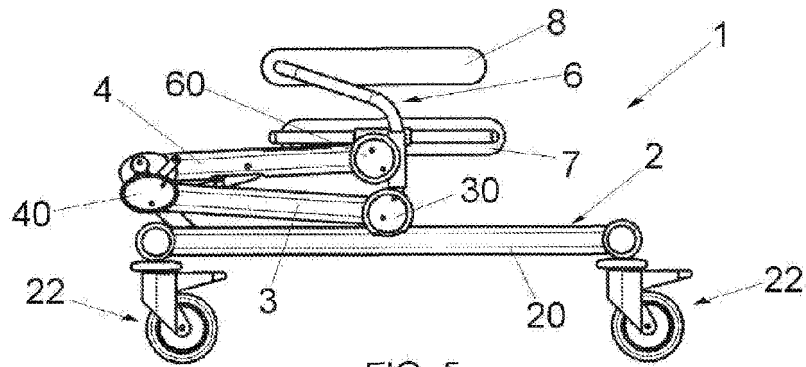


FIG. 4



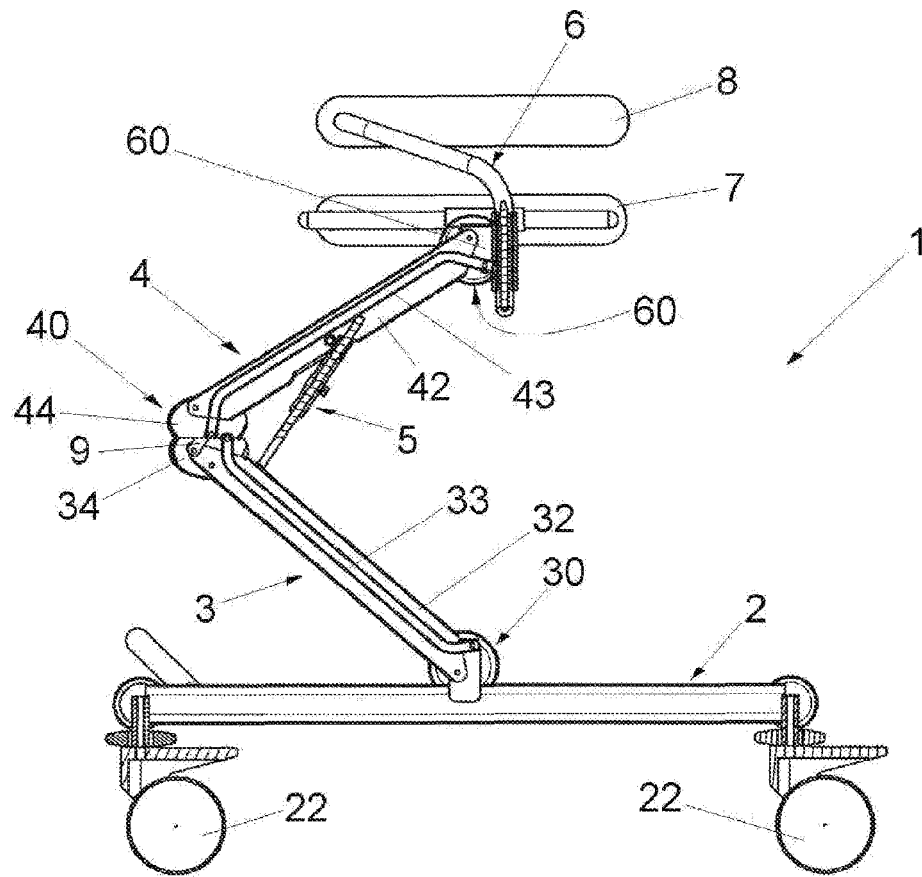


FIG. 1A