(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 799 054 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.11.2014 Bulletin 2014/45

(51) Int Cl.:
A61G 5/08 *(2006.01)*

(21) Application number: **14166471.4**

(22) Date of filing: **29.04.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **30.04.2013 GB 201307741**

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(54) Seat appliance with folding backrest

(57) The invention provides a seated invalid appliance, such as a wheelchair, with a stowable backrest arrangement. The seat appliance has side restraints and includes a linkage arrangement between the backrest and the side restraints such that as the backrest moves between a deployed and stowed configuration the side restraints correspondingly move between a restraint position and a stowed position. The backrest may be arranged to be pivotably movable between the deployed and stowed configurations and/or the side restraints may be arranged to be pivotably movable between the restraint position and the stowed position. A sliding or guided linkage may be provided between the backrest arrangement and the restraints. The invention is particularly suited for use with a wheelchair, or an invalid chair or a sporting appliance for a disabled or mobility-impaired user.

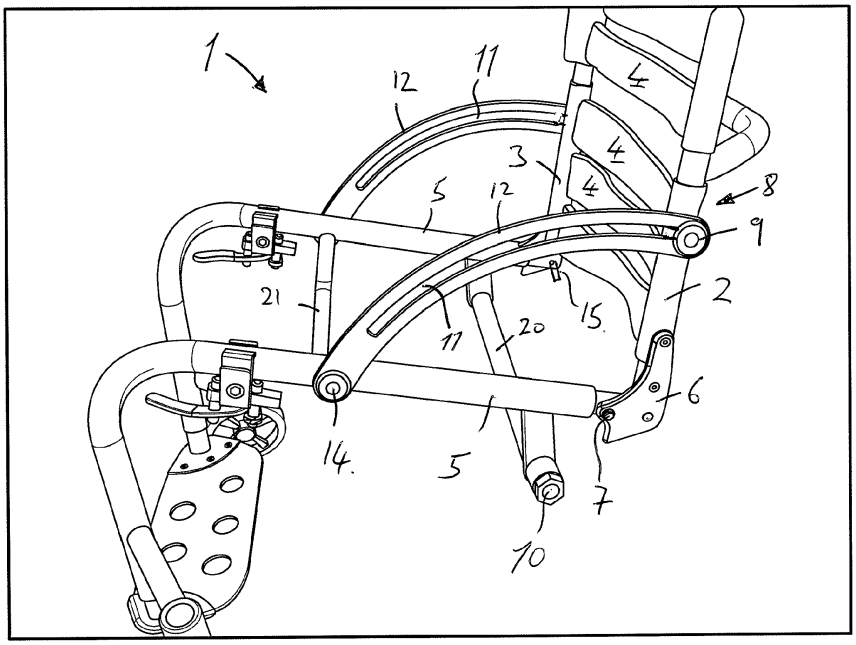


FIG. 4

EP 2 799 054 A1

Description

[0001] The present invention relates to a seat appliance with a stowable or folding backrest, and more particularly to a wheelchair with a stowable or folding backrest.

[0002] Prior art wheelchairs are known which have a backrest which is foldable down to lie adjacent the seat in a stowed orientation for storage and transportation.

[0003] An improved arrangement has now been devised.

[0004] According to a first aspect of the present invention, there is provided a seated invalid appliance with a stowable backrest arrangement, wherein the seated appliance has side restraints provided with a linkage to the backrest such that as the backrest moves between a deployed and stowed configuration the side restraints correspondingly move between a restraint position and a stowed position.

[0005] Preferably, the backrest is upright or substantially upright when in the deployed configuration.

[0006] Lowering or raising of the backrest arrangement to and from the stowed position causes the side restraints to correspondingly move to and from the stowed position and the restraint position in unison with the backrest arrangement.

[0007] Typically, in the stowed position the side restraints are lowered compared to a raised restraint position.

[0008] It is preferred that the backrest is arranged to be pivotably movable between the deployed and stowed configurations.

[0009] Preferably, the side restraints are arranged to be pivotably movable between the restraint position and the stowed position.

[0010] It is preferred that the position of coupling of the backrest arrangement and restraints moves as the backrest arrangement and restraints move to and from the stowed position.

[0011] It is preferred that a sliding or guided coupling is provided between the backrest arrangement and the side restraints.

[0012] A first end of the side restraint may be connected to the backrest, and a second end of the side restraint may be connected to a side member or side portion of the appliance. The position of the first end of the side restraint may be lower (i.e. closer to the ground) when it is in the stowed position then when it is in the restraint position.

[0013] The side restraint is preferably provided with an elongate arcuate guide for guiding movement of a guide member carried by the backrest arrangement.

[0014] It is preferred that the elongate arcuate guide comprises an elongate arcuate slot.

[0015] The guide member may protrude through the slot. The guide member may be configured to travel along the slot towards or in the direction of the front of the appliance as the backrest is moved towards the stowed position. The term 'front' is used in relation to the direction in which the user faces when seated in the deployed appliance.

[0016] Thus, the back rest may be in communication with the restraint at a variety of positions along the length of the restraint, by means of the guide member.

[0017] The guide member may be lower when the backrest is in the stowed position than it is when the back rest is in an upright (deployed) position.

[0018] The guide member may move away from the first end of the restraint as the back rest is moved to the stowed position.

[0019] The guide member may comprise an end stop, such as a flange or cap for example. Thus, the guide member may pass through the slot with the end stop on the outer face of the restraint i.e. away from the interior of the appliance where the user sits in use.

[0020] The seated invalid appliance may be a wheelchair, an invalid chair or a sporting appliance for a disabled or mobility-impaired user.

[0021] In the restraint position, with the backrest arrangement in the deployed (upright) orientation, the backrest may be braced against rearward movement by engagement with the end of the slot.

[0022] The arrangement is preferably such that, in the stowed position, the backrest is laid over the seat position of the seat.

[0023] It is preferred that locking means is provided for locking the backrest in the stowed position and the deployed position.

[0024] In a certain embodiment it is preferred that the same locking means locks the backrest in the stowed position and the deployed position.

[0025] The locking means may comprise a locking pin which is normally biased to a locking position.

[0026] In a certain embodiment, the backrest arrangement and the side restraints may be pivotally mounted at spaced locations to a common side frame member of the appliance.

[0027] In certain embodiments the side restraints comprise side struts. Beneficially, the side struts are curved side struts.

[0028] The side restraints may be c-shaped or arcuate in profile. Thus, the side restraints may take a generally bow-shaped form. The arcuate guide slot may be provided between the edges of the restraint, the slot following the arcuate profile of the restraint edges.

[0029] According to a second aspect, the invention provides a seated invalid appliance with a stowable backrest arrangement, wherein the seated appliance has side restraints coupled to the backrest arrangement the backrest arrangement and the side restraints being pivotally mounted to move between respective deployed and stowed configurations.

[0030] According to a further aspect, the invention provides a seated invalid appliance with a stowable backrest arrangement, the backrest arrangement moves between a deployed (typically upright) configuration and a stowed

configuration, the arrangement including a locking element engaging with the backrest in a first locking configuration to lock the backrest arrangement in the deployed configuration, and a second locking configuration to lock the backrest arrangement in the stowed configuration.

[0031] The seated invalid appliance may be a wheelchair, an invalid chair or a sporting appliance for a disabled or mobility-impaired user.

[0032] Preferred features of the first described aspect may of course also be preferred features in respect of the second and further aspects of the invention referred to.

[0033] The invention provides a compact arrangement, which is lightweight and simple in construction. It is cheap to manufacture compared with more elaborate alternatives. When in the stowed configuration, the side restraints and lie close to the body of the appliance in a convenient and easy to handle arrangement.

[0034] The invention will now be further described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a seated invalid appliance (wheelchair) with a stowable folding backrest in accordance with the invention (backrest in stowed orientation);

Figure 2 is a view similar to the view of figure 1 from a slightly different perspective and showing the locking means.

Figure 3 is a schematic side perspective view of the wheelchair appliance (wheels removed) with the backrest in the stowed orientation;

Figure 4 is a view from the same orientation of figure 4, but this time with the backrest in the substantially upright (deployed) orientation;

Figure 5 is a more detailed view corresponding to figure 4;

Figure 6 is a view from the rear of the appliance (wheels removed) with the backrest in the stowed orientation;

Figure 7 is a view similar to the view of figure 6 but from a slightly different perspective.

[0035] Referring to the drawings, and initially to, for example figure 7 there is shown a wheelchair appliance 1 in which the wheels 19 (usually secured to mountings 10) are shown de-mounted from the appliance for ease of explanation. The appliance 1 has a backrest arrangement 8 comprising a pair of spaced tubular uprights 2,3 and webbing bands 4 extending between the uprights 2, 3 to provide a back support. The uprights 2, 3 are pivotally mounted to respective side frame members 5 by means of a bracket 6 and pivot 7. The bracket 6 is secured to the respective upright 2, 3 and pivots with the respective upright 2, 3.

[0036] Each upright 2,3 is provided at about mid-way up the backrest arrangement with an outwardly projecting follower 9 which is fixed positionally with respect to the respective upright 2,3 but guided to be movable in an arcuate guide slot 11 of a respective side restraint arm 12, one of which is provided at each side of the seated appliance 1. Each side restraint arm 12 is pivotally mounted to the side frame members 5 at a forward position spaced from the pivotal mounting 7 of the backrest arrangement 8. Pivot formations 14 are shown in the drawings for mounting the side restraint arms 12. The slideability of the followers 9 in the slots 11 provide a mechanical sliding linkage between the uprights 2,3 and the side restraint arms 12.

[0037] In the deployed (upright) position of the backrest arrangement 8 (figure 7), the frame members 2,3 are held in the upright position by means of respective spring biased locking pins 15 provided one for each upright 2,3. The locking pins 15 engage in a securing aperture 16 provided in the bracket 6. In the upright position, the side restraint arms 12 act as structural members bracing with the uprights 2,3 and the side frame members 5 to provide structural integrity to the frame. The uprights 2,3 are prevented from pivoting forward to the stowed configuration by engagement of the locking pins 15 with the apertures 16. Abutment members 22 on the bottom ends of the uprights 2,3 abut against the trailing edges of the side frame members 5 when in the upright position.

[0038] Therefore, this arrangement enables the side restraint arms 12 to serve as side walls during use of the wheelchair, and act as restraints to prevent the user from falling out of the appliance.

[0039] The locking pins 15 are provided with a connecting line 17, which, when tugged, acts against the biasing springs to retract the locking pins 15 from engagement with the apertures 16. When this happens, the backrest arrangement can be pivoted forward to the stowed position in which the backrest arrangement overlays the seat position of the appliance. In the drawings the seat pad is not shown. The seat pad is secured onto the cross-members 20,21. As the backrest pivots forward from the upright position to the stowed position, the followers 9 are guided to pass along the arcuate guide slots in the side restraint arms 12. As this happens, the followers 9 act to urge downwardly the side restraint arms 12 which pivot downwardly about the pivot mountings 14. As this happens, the end of the respective securing pin 15 traces over the inward facing surface of the bracket 6.

[0040] Ultimately, continued lowering of the backrest arrangement 8 results in the backrest reaching the stowed position. This situation is shown in figures 1,2,3,6 and 7. As can be seen, particularly in figure 3, in the stowed configuration the followers 9 are orientated towards the opposed end of the guide slots 11 to their original position. Upon reaching the limit of movement toward

the stowed position, the pins 15 spring outwardly upon passing the trailing edge 6a of the bracket 6 to become located behind the trailing edge 6a of the bracket. This positioning prevents the backrest arrangement 8 from being moved back from the stowed position toward the upright position until the pins 15 are deliberately displaced against the biasing spring out of the way of the bracket 6 permitting pivotal movement.

[0041] The arrangement provides that the arrangement can be reconfigured quickly and easily between the stowed and deployed configurations, with movement of the backrest arrangement 8 automatically reconfiguring the side restraints 12.

[0042] The side restraint arms therefore provide more than one function:

- they function as side walls during use of the appliance to restrain the user and prevent him from falling out;
- they act as structural members bracing with the uprights and the side frame members to enhance structural integrity of the frame;
- they provide a restraint path for the followers which cause the respective restraint arms to be lowered or raised or collapsed into stowed or deployed positions respectively, thus providing an arrangement which is robust during use but compact and easy to handle/transport when not in use.

Claims

1. A seated invalid appliance with a stowable backrest arrangement, wherein the seat appliance has side restraints and includes a linkage arrangement between the backrest and the side restraints such that as the backrest moves between a deployed and stowed configuration the side restraints correspondingly move between a restraint position and a stowed position.

2. A seated invalid appliance according to claim 1, wherein the backrest is arranged to be pivotably movable between the deployed and stowed configurations.

3. A seated invalid appliance according to claim 1 or claim 2, wherein:

   i) the side restraints are arranged to be pivotably movable between the restraint position and the stowed position; and/or
   ii) the position of coupling of the backrest arrangement and restraints moves as the backrest arrangement and restraints move to and from the stowed position.

4. A seated invalid appliance according to ant preceding claim, wherein a sliding or guided linkage is provided between the backrest arrangement and the restraints.

5. A seated invalid appliance according to any preceding claim, wherein the side restraint is provided with an elongate arcuate guide for guiding movement of a guide member carried by the backrest arrangement.

6. A seated invalid appliance according to claim 5, wherein the elongate arcuate guide comprises an elongate arcuate slot.

7. A seated invalid appliance according to any preceding claim wherein in the stowed position the backrest is laid over the seat position of the seat.

8. A seated invalid appliance according to any preceding claim, wherein locking means is provided for locking the backrest in the stowed position and the deployed position.

9. A seated invalid appliance according to claim 8, wherein:

   i) the same locking means locks the backrest in the stowed position and the deployed position; and/or
   ii) the locking means comprises a locking pin which is normally biased to a locking position.

10. A seated invalid appliance according to any preceding claim, wherein the backrest arrangement and the side restraints are pivotally mounted at spaced locations to a common frame member of the seated invalid appliance.

11. A seated invalid appliance according to any preceding claim, wherein the side restraints comprise side struts.

12. A seated invalid appliance according to claim 11, wherein the side struts are curved side struts.

13. A seated invalid appliance with a stowable movable backrest arrangement, wherein the appliance has side restraints connecting to the backrest arrangement, the backrest arrangement and the side restraints being pivotally mounted to move between respective deployed and stowed configurations.

14. A seated invalid appliance according to any preceding claim, wherein:

   i) the backrest arrangement and the side restraints are pivotally mounted at spaced locations to a common frame member of the appli-

ance;
ii) the backrest is in an upright position when in the deployed configuration; and/or
iii) the appliance is a wheelchair, and invalid chair or a sporting appliance for a disabled or mobility-impaired user.

15. A seated invalid appliance with a stowable backrest arrangement, the backrest arrangement moves between a deployed (typically upright) and stowed configuration, the arrangement including a locking element engaging with the backrest in a first locking configuration to lock the backrest arrangement in the deployed configuration, and a second locking configuration to lock the backrest arrangement in the stowed configuration.

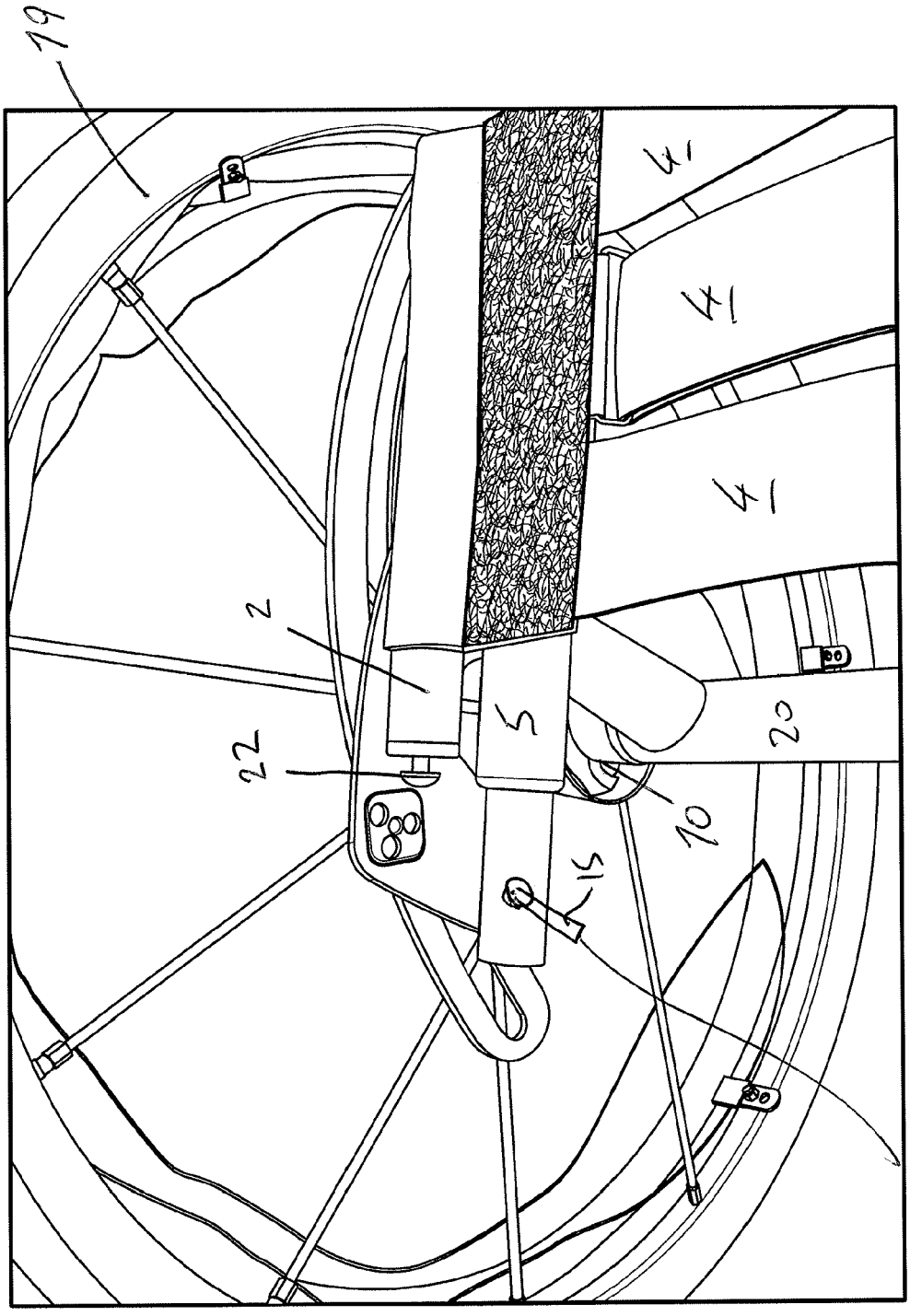
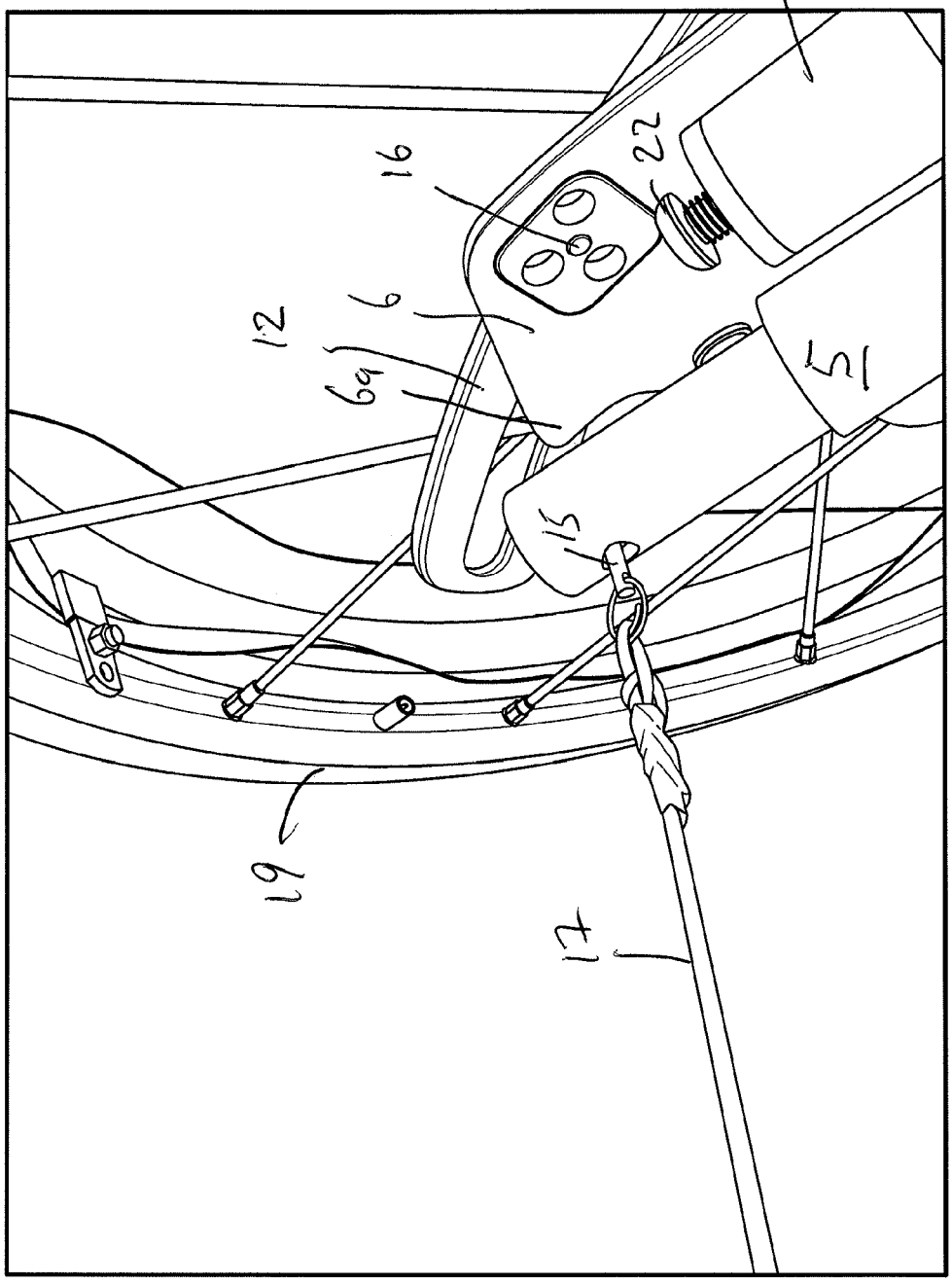


FIG. 1

Fig 2



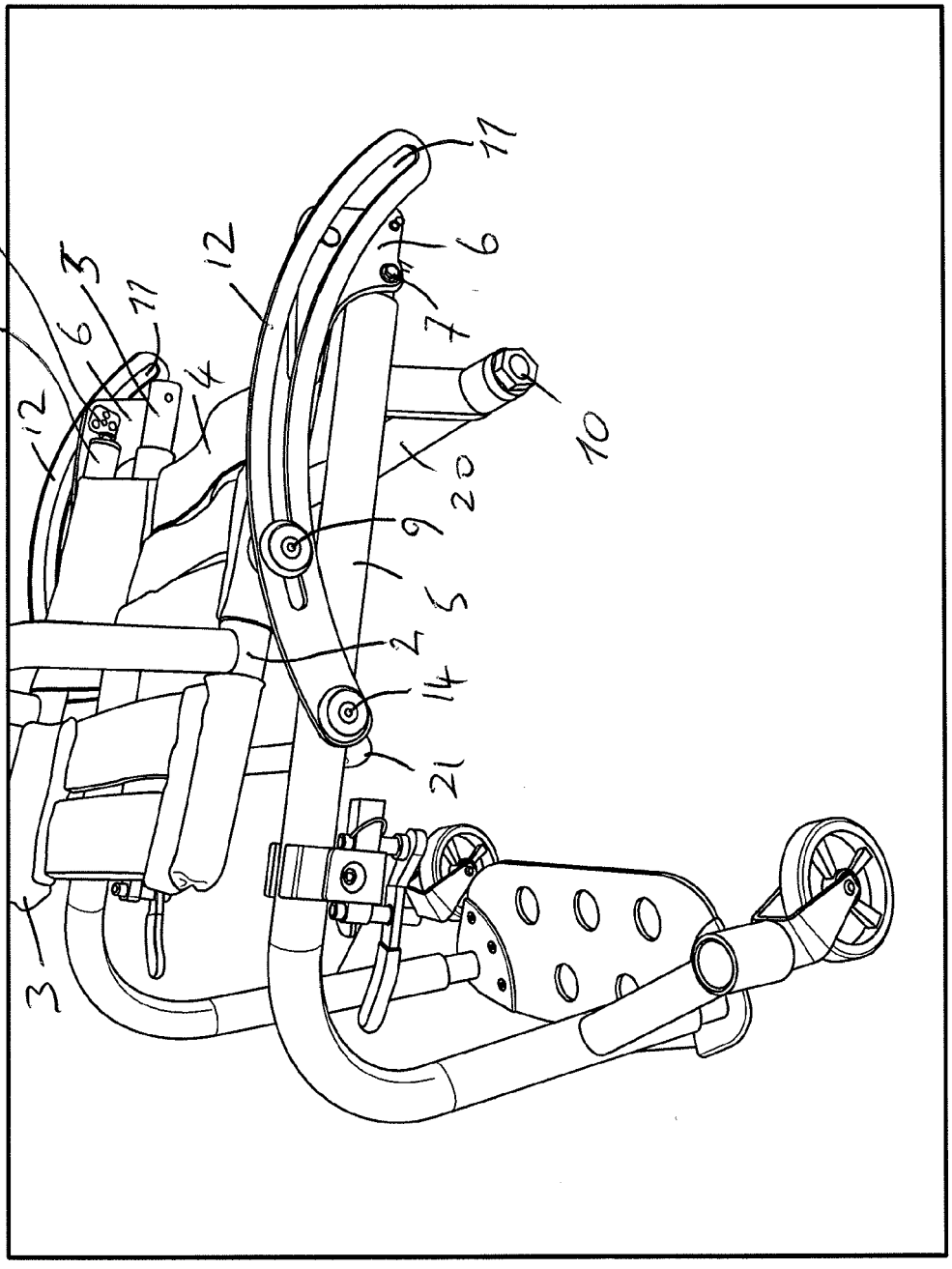


FIG. 3

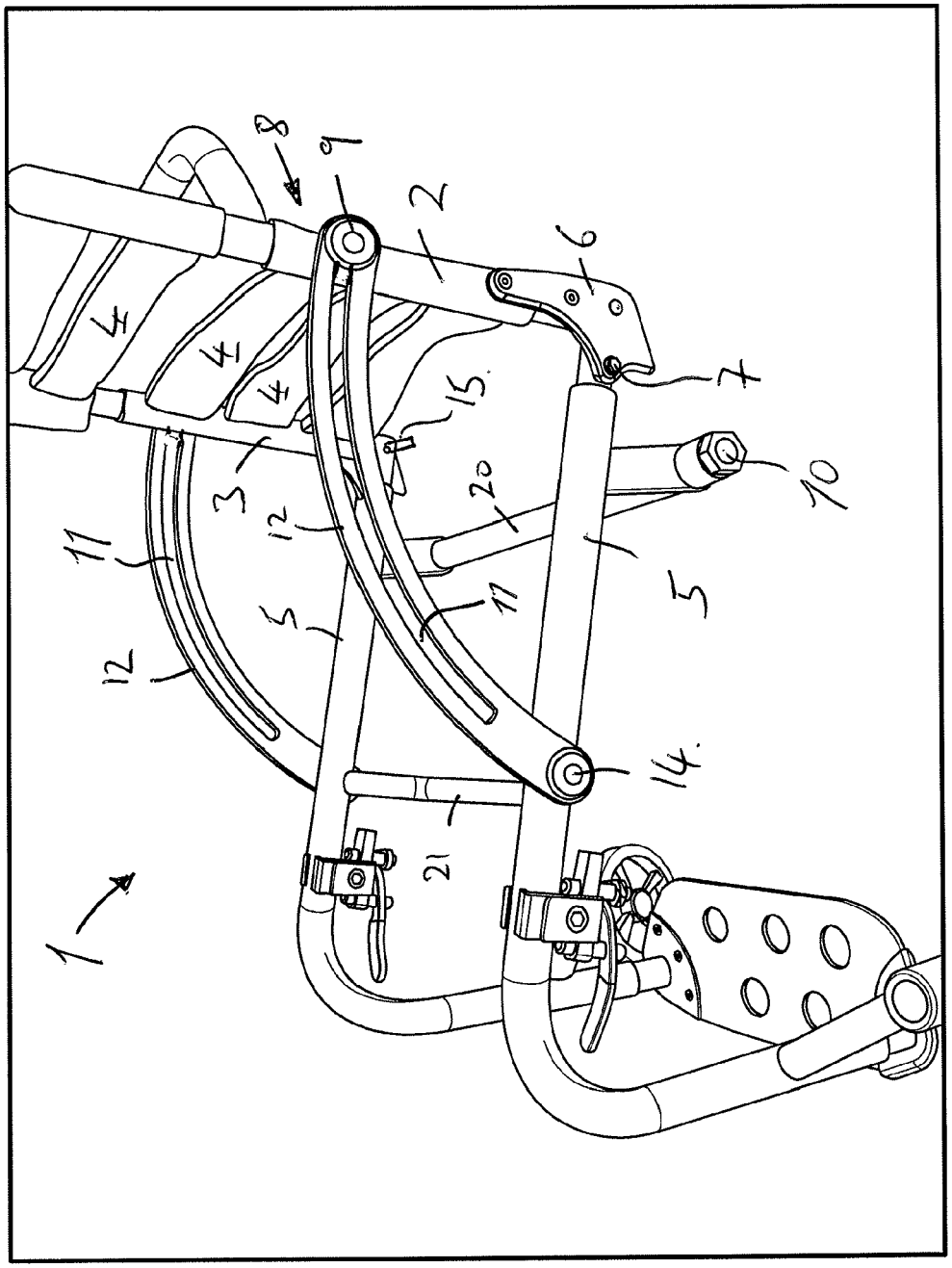


FIG. 4

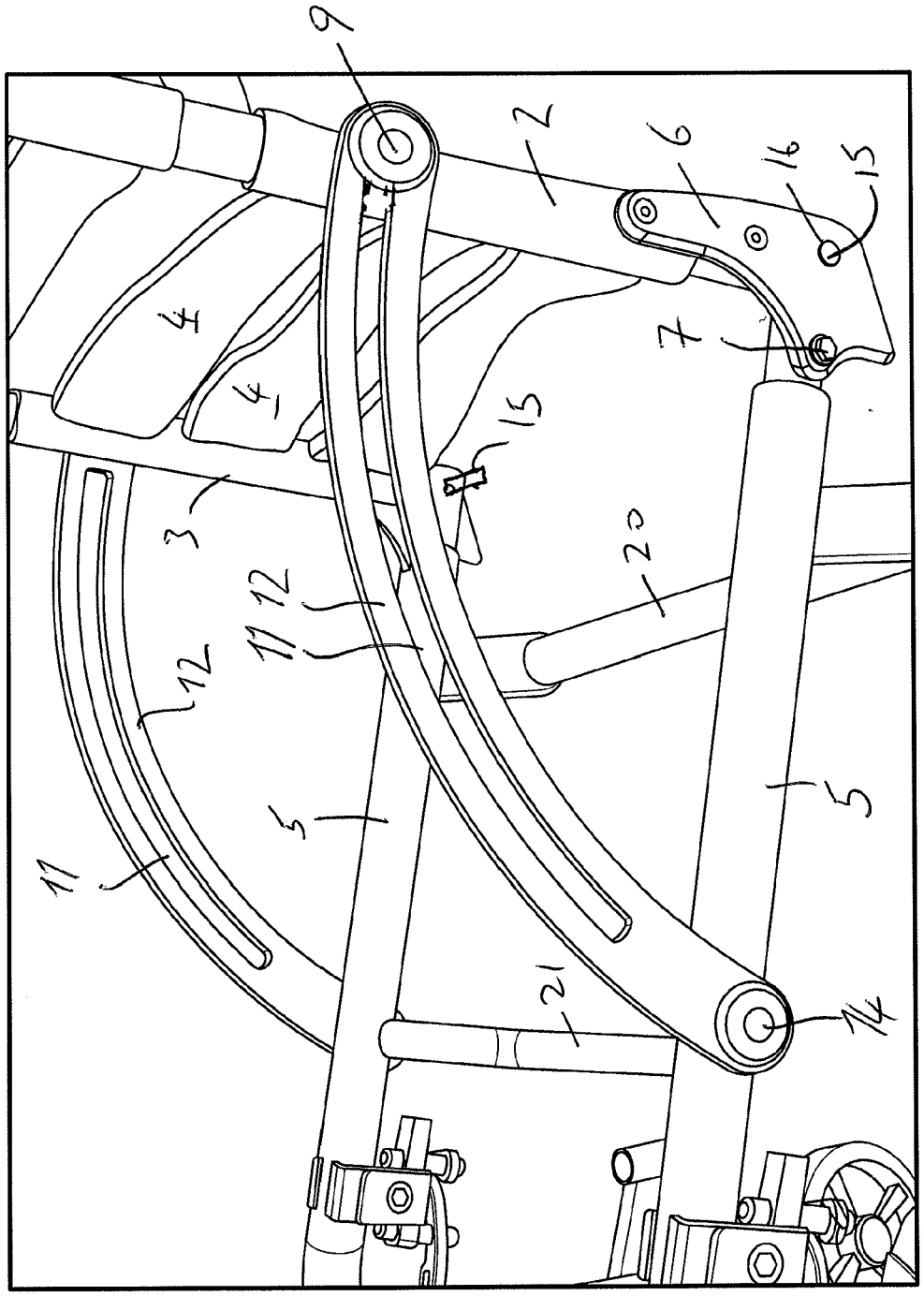


FIG. 5

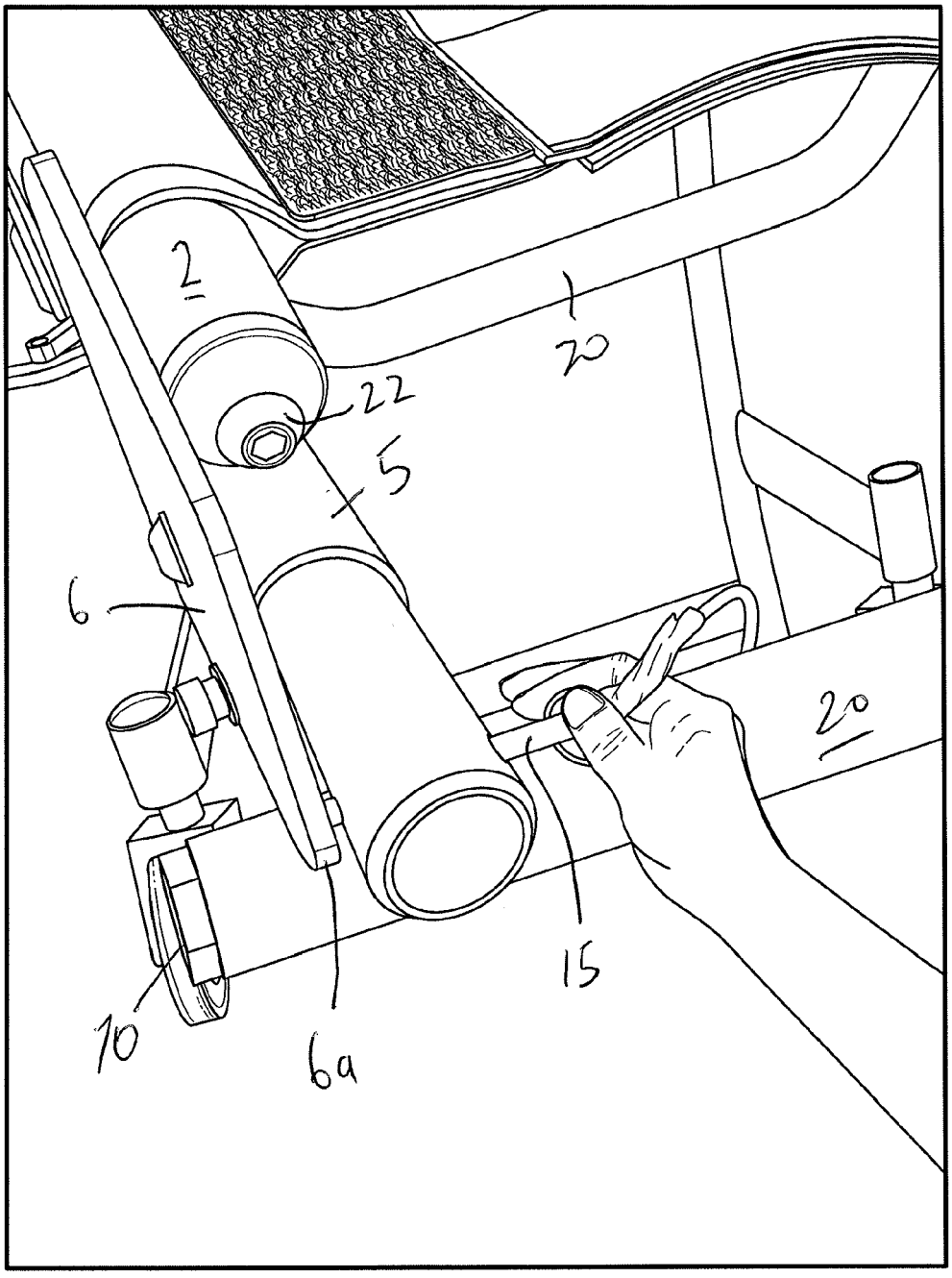


FIG. 6

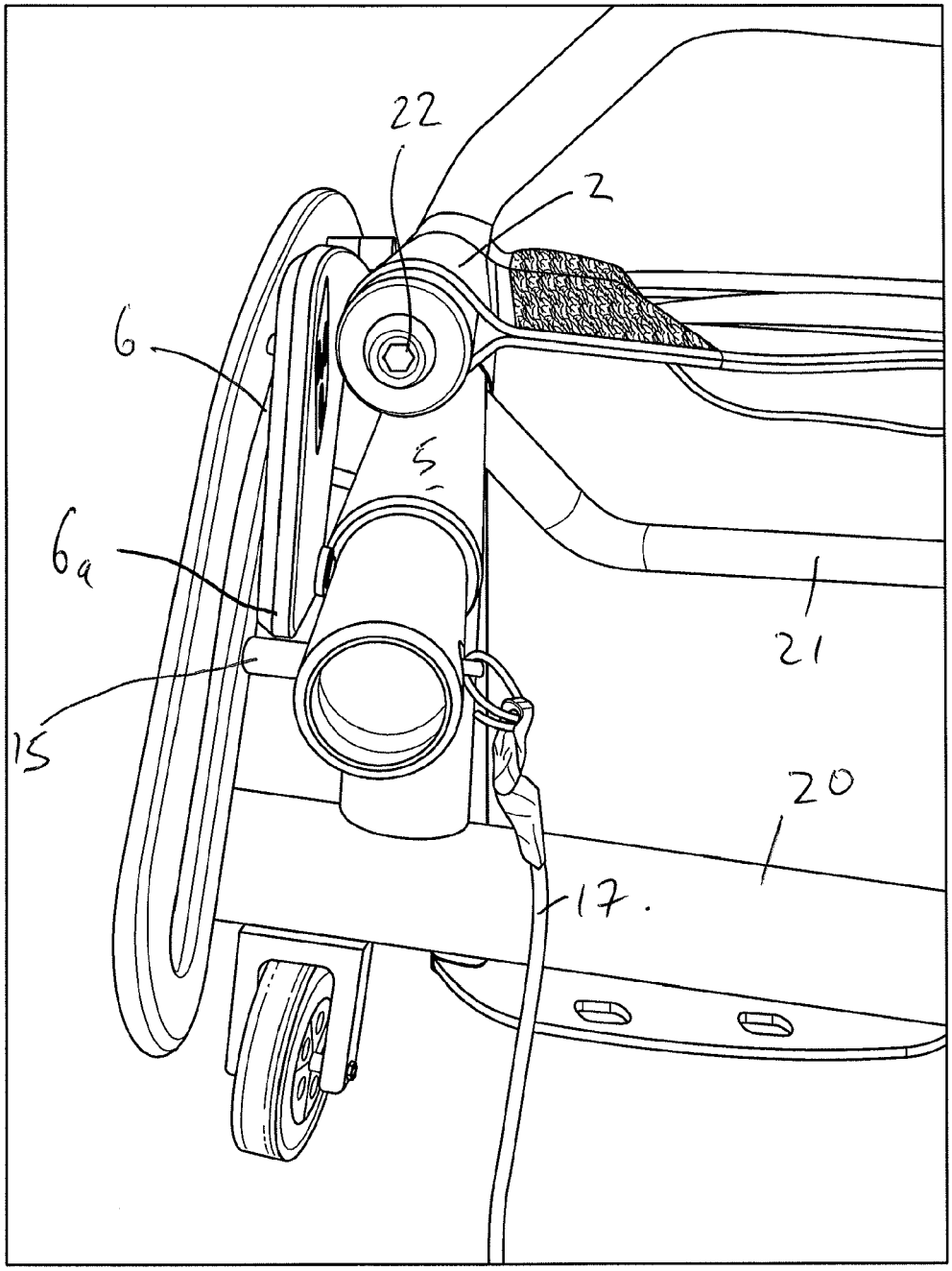


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 14 16 6471

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 6 070 934 A (SCHAEFER DONALD RICHARD [US] ET AL) 6 June 2000 (2000-06-06) * figures 3-6 *	1-8, 10-14	INV. A61G5/08
X	EP 1 454 606 A1 (VASSILLI SRL [IT]) 8 September 2004 (2004-09-08) * figures 1-5 *	1-7,10, 13,14	
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X	WO 2008/019496 A1 (PROMEN AID INNOVATIONS LTD [CA]; DICKIE ROBERT [CA]; COPELAND STEVE [C) 21 February 2008 (2008-02-21) * figures 1,2,4,8,9,11,12 *	1-4,7, 10,11, 13,14	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	1 September 2014	Gkama, Alexandra

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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