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**Datasheet for the decision
of 21 July 2023**

Case Number: T 2698/19 - 3.2.02
Application Number: 12807785.6
Publication Number: 2729108
IPC: A61G5/04, B60L11/18, B60L15/00,
A61G5/10
Language of the proceedings: EN

Title of invention:

MOTION-BASED POWER ASSIST SYSTEM FOR WHEELCHAIRS

Patent Proprietor:

Max Mobility, LLC

Opponent:

Alber GmbH

Headword:

Relevant legal provisions:

EPC Art. 56, 83, 100(c), 123(2)

Keyword:

Amendments - added subject-matter (yes)
Sufficiency of disclosure - auxiliary request (yes)
Inventive step - auxiliary request (yes)

Decisions cited:

G 0001/03, T 1107/06, T 0461/05, T 0226/85, T 0409/91,
T 0389/86

Catchword:



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Case Number: T 2698/19 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 21 July 2023

Appellant: Max Mobility, LLC
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 July 2019 concerning maintenance of the
European Patent No. 2729108 in amended form.**

Composition of the Board:

Chair M. Alvazzi Delfrate
Members: A. Martinez Möller
C. Schmidt

Summary of Facts and Submissions

- I. Appeals were filed by the patent proprietor and by the opponent against the interlocutory decision of the opposition division that, taking into account the amendments made by the patent proprietor in auxiliary request 1, which was filed during the oral proceedings, European patent No. 2729108 and the invention to which it related met the requirements of the EPC.
- II. Oral proceedings before the board took place on 21 July 2023.

The appellant/opponent (called "the opponent" below) requested that the decision under appeal be set aside and that the patent be revoked.

The appellant/patent proprietor (called "the proprietor" below) requested that the decision under appeal be set aside and that the patent be maintained as granted. In the alternative, the proprietor requested that the patent be maintained on the basis of one of the auxiliary requests 1 to 34 as defined in annex 2, dated 30 September 2020. The requests numbered 1 to 27 had been filed with the statement of grounds of appeal, and the requests numbered 28 to 34 were filed with the letter dated 30 September 2020.

- III. Claim 1 of the main request (patent as granted) reads as follows.

"A motion-based power assist system for wheelchairs (8), comprising:

a motion sensing system; and
a power assist drive system comprising a single
wheel drive attachment (10), wherein the motion of
the power assist system is used as input for
activation of the drive system,
characterized in that
the power assist drive system comprises one or more
attachment mounts (22) for removable attachment to
a wheelchair axle bar (14)."

Compared with claim 1 of the main request, claim 1 of
auxiliary request 1 further includes the following
feature added to the end of the claim.

", and
the one or more attachment mounts (22) are configured
to be clampable to the wheelchair axle bar (14)."

The text of the lower-ranked auxiliary requests is not
relevant to this decision.

IV. The following documents are relevant to this decision.

D7 "Torque Sensor Free Power Assisted Wheelchair",
Daniel Petersson, Jonas Johansson, Ulf Holmberg and
Björn Åstrand, Proceedings of the 2007 IEEE 10th
International Conference on Rehabilitation Robotics,
13-15 June 2007, Noordwijk, Netherlands

D8 "Torque Sensor Free Power Assisted Wheelchair",
Jonas Johansson and Daniel Petersson, Master's Thesis
in Electrical Engineering, Halmstad University

D9 "Sensor Free Power Assisting Control Based on
Velocity Control and Disturbance Observer", S. Oh and
Y. Hori, IEEE ISIE 2005 - Dubrovnik, Croatia, pp.
1709-1714, June 20-23 2005

D10 US 5,222,567

D11 US 4,759,418
D12 US 5,113,959
D13 US 6,729,422 B2

V. The opponent's arguments, where relevant to the present decision, can be summarised as follows.

Main request - added subject-matter

Page 4, lines 11-15 of the application as filed described the attachment mounts as being clamped. This feature was not included in claim 1, thus resulting in added subject-matter.

Further reasons why claim 1 comprised added subject-matter were indicated in the passages of the notice of opposition that were reproduced in the opponent's statement of grounds of appeal.

Auxiliary request 1 - sufficiency of disclosure

The invention defined by claim 1 was not sufficiently disclosed (Article 83 EPC).

The patent specification did not teach how to use motion data to distinguish between voluntary and involuntary accelerations, such as acceleration caused by a slope. Both types of acceleration were in the same order of magnitude and could not be distinguished from each other. For example, the acceleration that the wheelchair underwent on a downhill slope could activate the drive system and cause increased acceleration of the wheelchair. This was unacceptable, and dangerous for the user. Hence, a proper distinction between voluntary and involuntary accelerations was not a nice-to-have feature but an essential feature of the

invention. This feature had to be taken into account when assessing sufficiency of disclosure, even if it was not recited in claim 1 but only mentioned in the patent specification.

Decision T 226/85 showed that insufficient disclosure could be the outcome of unsatisfactory results. Moreover, as stated in decision T 409/91, the disclosure of one way of performing the invention was sufficient only if it enabled the person skilled in the art to carry out the invention over the whole scope of the claim. The claim covered a system that distinguished between the two types of acceleration using only motion data, but the patent specification did not teach how to achieve this.

Auxiliary request 1 - inventive step

Each of documents D10 to D13 could be regarded as a starting point for the invention of claim 1, and described a manually controlled attachable power-assist system for wheelchairs.

The four features distinguishing the subject-matter of claim 1 from the disclosure of any of documents D10 to D13 did not interact with each other to produce a synergistic effect. Rather, they could be grouped into two groups solving two unrelated partial problems. The features relating to the motion-based activation solved the problem of electrically supporting the motion while at the same time providing a therapeutic effect that was useful for the user. The features relating to the attachment to the axle bar solved the problem of attaching the system to an element which extended in a direction transverse to the direction of motion of the wheelchair.

Faced with the first problem, the person skilled in the art would have consulted any of documents D7 to D9. Even though D7 to D9 used the two rear wheels for assistance, the person skilled in the art would have understood the advantages of the motion-based activation taught by D7 to D9 and implemented it in the single drive wheel of any of documents D10 to D13.

With regard to the second problem, the skilled person would have modified the attachment mechanisms of any of documents D10 to D13 for attachment to a transverse element of the wheelchair, such as the axle bar, using common general knowledge.

Hence, starting from any of documents D10 to D13, the person skilled in the art would have solved the two problems and arrived at a power-assist system falling under the scope of claim 1. The subject-matter of claim 1 was thus not inventive.

VI. The proprietor's arguments, where relevant to the present decision, can be summarised as follows.

Main request - added subject-matter

Claim 1 of the patent as granted did not comprise added subject-matter.

The disputed feature that the attachment mount was clamped to the wheelchair was not needed, since it was not present in original claim 1 either. Page 4, lines 11-15 of the application as filed related to an exemplary embodiment. It was thus clear that the disputed feature was an optional feature and that the disclosure of the mounting attachment was more general.

Page 6, lines 22-23 and page 7, lines 9-11 also referred to one or more mounting attachments, for which a clamp was merely an illustrative embodiment. It was apparent to the person skilled in the art that other solutions were possible.

In view of T 1107/06, there was an implicit disclosure of attachment mounts other than a clamp. Moreover, T 461/05 held that, if features from a particular embodiment were included, the omission of the remaining features would introduce new information if the omitted features were necessary to carry out the particular embodiment. The disputed feature was not necessary to carry out the embodiment and therefore its absence did not introduce new information.

The further objections of added subject-matter were mere repetitions of first-instance submissions and should not be admitted.

Auxiliary request 1 - sufficiency of disclosure

The invention in claim 1 was sufficiently disclosed. Paragraphs [0014] and [0021] of the patent specification taught an implementation of the motion-based activation. Even if the system could not always distinguish between voluntary and involuntary accelerations, this would not prevent the person skilled in the art from carrying out the invention.

Auxiliary request 1 - inventive step

The subject-matter of claim 1 was not obvious when starting from any of documents D10 to D13.

Each of documents D10 to D13 disclosed a power-assist system which was attached to two side members of a wheelchair. In each of documents D10 to D13, activation of the assistance was manual and required a manual controller, which was reachable by the user and was in a wired connection with the power-assist system. Installation of the attachable power-assist system of each of documents D10 to D13 on a wheelchair thus required attachment to two side members of the wheelchair and, additionally, the provision of a manual controller that was in a wired connection with the system.

The four features distinguishing the subject-matter of claim 1 from any of documents D10 to D13 thus had a synergistic effect, resulting in a more compact system which was easier to attach and detach. The problem to be solved could be regarded as providing a compact, lightweight power-assist system that could easily be installed on and uninstalled from a wheelchair.

D7 to D9 dealt with integrated power-assist systems and not with easier attachment of a power-assist system. Hence, the person skilled in the art would not have consulted them. Moreover, D7 to D9 taught using sensors for separately measuring the speed of each rear wheel resulting from the force applied to each of them, in order to separately control the assistance for each of the wheels. Therefore, their teaching was not readily combinable with any of documents D10 to D13. D9 dealt with measuring the human force acting on the wheelchair's rim. D7 and D8 taught that individual support of each rear wheel when moving in different directions made it possible to make a tight turn with the wheelchair. Thus, D7 to D9 taught away from the invention of claim 1.

Reasons for the Decision

1. The patent

Many people rely on a wheelchair as their primary mode of locomotion. It is beneficial from a physical and psychological point of view if the users manoeuvre the wheelchair themselves by pushing. However, this can also lead to upper limb pain and injury. It is thus beneficial to reduce the stresses of propulsion on the user's upper body.

The patent addresses this by proposing a power-assist system for wheelchairs, in particular a motion-based power-assist system which uses the motion of the power-assist system as input for activation of the power-assist drive system. For example, if an acceleration exceeding a certain threshold is detected, the system determines that this is the result of the wheelchair being pushed, and activates an assistive drive force.

The invention as defined in claim 1 comprises a motion sensing system and a power-assist drive system comprising a single wheel drive attachment and one or more attachment mounts for removable attachment to a wheelchair axle bar.

2. Main request - added subject-matter

- 2.1 The opposition division held that claim 1 of the patent as granted comprised added subject-matter. The proprietor contests this finding and submits that the application as filed (published as WO 2013/006818 A2) discloses a system with the feature "a power assist

drive system comprises one or more attachment mounts (22) for removable attachment to a wheelchair axle bar (14)", and without the feature that these attachment mounts are clamped to the axle bar.

- 2.2 The passage at page 4, lines 11-15 of the application as filed relates to an exemplary embodiment which combines the feature "a single drive wheel attachment that mounts to the axle" and the feature "[a]ttachment mounts are clamped to the axle", together with the indication that it enables quick connection and release of the system. Hence, this passage does not disclose attachment mounts for removable attachment in general, but only attachment mounts which are clamped to the axle.
- 2.3 The "mounting attachment 22" is mentioned on page 6, lines 22 to 23 and on page 7, lines 9 to 11. Both passages describe the embodiment of Figures 1 and 2 (see page 6, lines 19 to 20), which show the attachment mount 22 clamped to the axle bar. Hence, the passages are not to be considered in isolation but only in conjunction with the corresponding figures. It follows that they do not provide support for a mounting attachment which is not clamped to the axle bar.
- 2.4 Claim 1 as originally filed does not disclose any attachment mounts or clamps. Figure 3 does not show a clamp, but it does not show an attachment mount either. Hence, neither claim 1 nor Figure 3 provides support.
- 2.5 In summary, the application as filed discloses the feature that the system comprises attachment mounts for removable attachment, but only in combination with these attachment mounts being clamped to the axle bar of a wheelchair. The two features are closely related

to each other, since, as disclosed on page 4, lines 13-15, the quick connection and release of the system is enabled by the attachment mounts being clamped to the axle bar.

2.6 The fact that the person skilled in the art may have known that other solutions exist for the attachment mounts, or that the releasable attachment could instead have been located between the drive linkage 18 and the mounting attachment 22, does not alter what is disclosed in the application as filed.

2.7 The two decisions cited by the proprietor do not lead to a different conclusion either. In the application as filed, there is no "generic disclosure", in the sense of T 1107/06, of attachment mounts for releasable attachment which attach in a way other than by clamping. In decision T 461/05, the competent board held that new information was introduced by an intermediate generalisation if the features omitted from a particular embodiment were necessary to carry out that particular embodiment. It cannot be inferred from this that there is no introduction of new information otherwise, in particular if the features added are closely related to some of the omitted features (see also T 461/05, point 2.6 of the Reasons, second sentence).

2.8 It follows from the above considerations that including the feature of attachment mounts for removable attachment without including the feature that these mounts are clampable to the wheelchair's axle bar results in claim 1 comprising subject-matter which extends beyond the content of the application as filed. Hence, the ground for opposition under Article 100(c) EPC prejudices maintenance of the patent as granted.

2.9 The opponent submitted further objections of added subject-matter. These submissions are verbatim repetitions of first-instance submissions, and do not address the reasons given in point 14.2 of the decision under appeal, which explained why these further objections were found not to be convincing. The board thus decided not to take these submissions into account, pursuant to Article 12(4) RPBA 2007.

3. Auxiliary request 1

3.1 Auxiliary request 1 corresponds to the version which was found to be allowable in the appealed decision. The feature added to claim 1 of auxiliary request 1 finds support on page 4, lines 13 to 15 of the application as filed.

3.2 Sufficiency of disclosure

3.2.1 The opposition division concluded that the invention was sufficiently disclosed. The opponent contests this finding, and submits that the patent specification does not teach how to distinguish between voluntary and involuntary accelerations, such as the acceleration occurring when the wheelchair is on a downward slope. The voluntary and involuntary accelerations had the same order of magnitude and thus could not be distinguished from each other using only data from motion sensors.

3.2.2 Claim 1 does not comprise any feature specifying that the system is able to distinguish between voluntary and involuntary acceleration. It is true that a power-assist system which does not properly distinguish between both types of acceleration may entail a risk

under certain circumstances, for example if a wheelchair starts to move downwards on a slope, and the drive system is activated and increases the downward acceleration. However, this does not mean that such a distinction between voluntary and involuntary accelerations is a feature which must be regarded as implicit in claim 1. Generally, the fact that using an apparatus encompassed by a claim may involve some risk has no bearing on whether the invention defined by that claim can be carried out. The person skilled in the art would not read additional unclaimed features into claim 1 in order to reduce potential risks associated with an apparatus without those features. Features which are not claimed are not relevant to sufficiency of disclosure (G 1/03, Reasons 2.5.2).

- 3.2.3 The patent specification describes an embodiment in which activation of the drive system occurs once the measured acceleration of the power-assist system exceeds a certain threshold (see paragraphs [0017] and [0021] of the patent specification). The person skilled in the art can thus carry out the invention, implementing the motion-based activation accordingly. For the reasons indicated in the previous paragraph, the issue of whether an implementation using a threshold would reliably distinguish between voluntary and involuntary accelerations is irrelevant in assessing whether the invention can be carried out.
- 3.2.4 The opponent refers to decisions T 226/85 and T 409/91.
- 3.2.5 In T 226/85, claim 1 related to a composition. Some of its features were defined using ranges, and some were functional features. In particular, one claimed functional feature related to the stability of the composition. The competent board considered that,

without further guidance, only a single specific way of carrying out the invention was insufficient, in view of the difficulty of finding other embodiments which satisfied the functional feature. The situation underlying T 226/85 is very different from the present one, since claim 1 of the contested patent does not specify that voluntary and involuntary accelerations must be distinguished from each other.

3.2.6 In T 409/91, claim 1 also related to a composition (distillate fuel oil) defined *inter alia* by structural and functional properties of the composition. The competent board inferred from the application that the inclusion of a structurally defined class of additives which was not mentioned in the claim was essential to obtain a fuel oil with the claimed properties. The competent board concluded that the claimed invention was not sufficiently disclosed because it did not enable the person skilled in the art to obtain a fuel oil without using those additives. In contrast, in the present case, it is not essential to distinguish between voluntary and involuntary accelerations in order to implement a motion-based activation as claimed. The question of whether the two types of acceleration are correctly distinguished relates to the reliability of the claimed system in certain circumstances, rather than to the possibility of implementing that system.

3.2.7 Hence, the opponent's objection that the claimed invention is not sufficiently disclosed within the meaning of Article 83 EPC is not convincing.

3.3 Inventive step

3.3.1 Each of documents D10 to D13 discloses an attachable power-assist system for wheelchairs which may be regarded as a starting point for the invention of claim 1. It is common ground that none of documents D10 to D13 discloses the following features of claim 1.

(A.1) "a motion sensing system"

(A.2) "wherein the motion of the power assist system is used as input for activation of the drive system"

(B.1) "one or more attachment mounts for removable attachment to a wheelchair axle bar"

(B.2) "the one or more attachment mounts are configured to be clampable to the wheelchair axle bar"

3.3.2 It is disputed whether these features correspond to a combination invention, or whether they solve two so-called "partial problems".

3.3.3 In each of documents D10 to D13, the system is activated manually by a user sitting in the wheelchair, by means of a control or switch easily reachable by the wheelchair user (within arm's reach) and wired to the drive-wheel motor or its controller:

- in D10: hand control assembly 106 in Figures 1 and 5 and in column 6, lines 11 to 34 and 52 to 54
- in D11: switches 66 and 68 in Figure 5, column 4, lines 62 to 66 and column 6, lines 21 to 25
- in D12: Figure 11 and column 7, line 67 to column 8, line 7
- in D13: Figure 2, column 2, lines 37 to 60 and column 4, lines 3-5; in D13 the wiring is provided within the vertical shaft 11, resulting in a bulky system

- 3.3.4 Moreover, the system of each of documents D10 to D13 uses a horizontal transverse structure (e.g. a rod) on which the drive wheel is mounted. This structure is then attached, using at least two mounting attachments, to side frame members at each side of the wheelchair:
- in D10: Figure 1
 - in D11: Figure 3
 - in D12: Figure 3 and column 3, lines 62 to column 3, line 1
 - in D13: Figure 1 and column 2, lines 61 to 67
- 3.3.5 In contrast, the system according to claim 1 can be attached to the wheelchair axle bar, for example using a single attachment mount clamped to the axle bar. This eliminates the need for a transverse structure, thus making possible a lighter-weight and more compact system attached to a single component of the wheelchair.
- 3.3.6 In addition, by activating the power-assist system based on the system's motion as defined in claim 1, it is not necessary to mount on the wheelchair a control device located within the user's reach and enabling the user to manually activate the power-assist system. Hence, it is also unnecessary to provide a wired connection between that control device and the power-assist drive system.
- 3.3.7 The distinguishing features are not merely juxtaposed features which do not influence each other, as argued by the opponent with reference to T 389/86. Rather, they cooperate with each other to provide a more compact system (no transverse structure, no need for a control device within arm's reach that is wired to the drive system) which can easily be attached to and

detached from a wheelchair (no need for attachment to two frame members, no need to provide a wired connection from the drive system on the axle bar to a control device some distance away).

- 3.3.8 It follows that partial problems are not applicable in the present case. Rather, the problem to be solved by the distinguishing features can be regarded as the provision of a compact power-assist system that can easily be installed on and removed from a wheelchair (see also paragraph [0012] of the patent specification).
- 3.3.9 The opponent refers to the combination of any of documents D10 to D13 with any of documents D7 to D9. Each of documents D7 to D9 deals with a motion-based power-assist system that uses two motors, each motor being integrated in one of the rear wheels of a wheelchair. As the systems of D7 to D9 are not attachable but integrated into the wheelchair, D7 to D9 do not address the problem of providing a system that can easily be installed and removed. Therefore, the person skilled in the art starting from any of documents D10 to D13 and faced with the above problem would not have consulted any of documents D7 to D9. Even if those documents had been consulted to achieve a more compact system, the teaching of providing a system integrated within the wheelchair's rear wheels would have led away from the solution of claim 1, which deals with an attachable system.
- 3.3.10 In view of this, the opponent's arguments regarding the further modification of the system of each of documents D10 to D13 for attachment to the axle bar are irrelevant.

- 3.3.11 Even if, for the sake of argument, the opponent's view that there is no synergy between features (A) (A.1 and A.2 above) and (B) (B.1 and B.2 above) were accepted, this would not lead to the conclusion that the claimed subject-matter was obvious. Contrary to the opponent's view, D7 to D9 did not render it obvious to provide a therapeutic effect that was useful for the user by means of the features under (A).
- 3.3.12 None of documents D7 to D9 refers to a therapeutic effect. It is thus questionable whether they would have been consulted in the context of the above problem.
- 3.3.13 Even if they had been consulted, as argued by the opponent, D7 to D9 teach measuring the velocity of each rear wheel of the wheelchair in order to separately control a motor provided on each rear wheel.
- 3.3.14 D7 and D8 even emphasise the advantages of measuring and controlling each rear wheel individually, referring for example to the different loads on each wheel, the possibility of assisting the user in rotation of the wheels in different directions to make a tight turn, or the adjustment of the assisting support for each wheel individually to account for different levels of strength in each arm (see D7: page 153, right-hand column, first paragraph, last two sentences; page 154, right-hand column, third paragraph; D8: page 19, last paragraph, penultimate sentence; page 31, first two paragraphs; page 52, last paragraph, third to sixth sentences). As for D9, its purpose is to use a disturbance observer to obtain the human force (page 1709, right-hand column, penultimate paragraph, first sentence); the application to a wheelchair with propelled rims (i.e. with a motor on each rear wheel)

is only mentioned as an example (see section III.C on pages 1711 and 1712).

3.3.15 Hence, if the person skilled in the art had consulted any of these documents, they would at most have learnt the advantages of providing motion-based activation for each of the two rear wheels. Thus, none of documents D7 to D9 would have prompted the person skilled in the art to provide motion-based activation for a detachable single-wheel power-assist system such as that disclosed in any of documents D10 to D13. The question of whether any of these systems would additionally have been modified for attachment to a wheelchair axle bar can be left unanswered.

3.3.16 Therefore, the objection of lack of inventive step starting from any of documents D10 to D13 is not convincing.

3.4 It follows that the patent can be maintained on the basis of auxiliary request 1, which was found to comply with the requirements of the EPC in the contested decision. Hence, neither of the appeals is successful.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chair:



A. Chavinier-Tomsic

M. Alvazzi Delfrate

Decision electronically authenticated