

Internal distribution code:

- (A) [-] Publication in OJ
- (B) [-] To Chairmen and Members
- (C) [-] To Chairmen
- (D) [X] No distribution

**Datasheet for the decision
of 10 April 2024**

Case Number: T 2174/19 - 3.4.02

Application Number: 13710537.5

Publication Number: 2810268

IPC: G09B1/34, G09B19/08, G09B19/04

Language of the proceedings: EN

Title of invention:
APPARATUS TO SIMULATE DRIVING A LAND VÉHICLE

Patent Proprietor:
VI-grade GmbH

Opponent:
McLaren Racing Limited

Headword:

Relevant legal provisions:
EPC Art. 83, 54(1), 56
RPBA 2020 Art. 13(2)

Keyword:

Sufficiency of disclosure - main request (yes)

Novelty - main request and first auxiliary request (no)

Inventive step - second auxiliary request (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2174/19 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 10 April 2024

Appellant: VI-grade GmbH
(Patent Proprietor) Im Tiefen See 45
64293 Darmstadt (DE)

Representative: Petraz, Gilberto Luigi
GLP S.r.l.
Viale Europa Unita, 171
33100 Udine (IT)

Respondent: McLaren Racing Limited
(Opponent) McLaren Technology Centre
Chertsey Road
Woking Surrey GU21 4YH (GB)

Representative: Slingsby Partners LLP
1 Kingsway
London WC2B 6AN (GB)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 31 May 2019
revoking European patent No. 2810268 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman R. Bekkering
Members: A. Hornung
T. Karamanli

Summary of Facts and Submissions

I. The patentee appealed against the decision of the opposition division revoking European patent No. 2 810 268.

Opposition had been filed against the patent as a whole and based on the grounds for opposition of Article 100(a), together with Articles 54(1) and 56 EPC, Article 100(b) EPC and Article 100(c) EPC.

The opposition division held that the subject-matter of claim 1 of the main request and the first auxiliary request then on file lacked novelty and that the subject-matter of claim 1 of the second and third auxiliary requests then on file lacked an inventive step.

II. Oral proceedings before the board were held on 10 April 2024. The patentee (appellant) filed claims 1 to 9 of a new auxiliary request 2 and pages 2 to 6 of an amended description.

III. The patentee (appellant) requested that the decision under appeal be set aside and that the patent be maintained as amended on the basis of the claims according to the main request forming the basis of the decision under appeal or one of auxiliary request 1 forming the basis of the decision under appeal, auxiliary request 2 filed during the oral proceedings of 10 April 2024 or auxiliary request 3 forming the basis of the decision under appeal.

IV. The opponent (respondent) requested that the appeal be dismissed.

V. The following documents, which were relied on in the first-instance opposition proceedings, are referred to in the present decision:

D1: US 2005/0042578 A1,

D5: "Planar Parallel 3-RPR Manipulator", R.L. Williams II et al., Proceedings of the Sixth Conference on Applied Mechanisms and Robotics, Cincinnati OH, December 12-15, 1999.

The patentee's written submission is designated P1 as follows:

P1: statement of grounds of appeal filed on 9 October 2019.

The opponent's written submissions are designated O1 and O2 as follows:

O1: letter dated 24 February 2020,

O2: letter dated 11 April 2022.

VI. Independent claim 1 according to the patentee's main request reads as follows (the features of claim 1 are preceded by the numbering **a)** to **h)** as defined in the appealed decision, point 2.1):

a) "Apparatus to simulate driving a land vehicle comprising

b) a fixed base platform (11),

c) a mobile platform (12) disposed above said base platform (11),

d) a mobile driver's position (13), associated with the mobile platform (12) and in which a driver has his seat during normal use, and

e) movement means (19) associated with the base platform (11) and with the mobile platform (12) to provide the

movement of said mobile platform (12) with respect to the base platform (11), characterized in that

f) the base platform (11) is provided with a flat support surface (20), said mobile platform (12) is disposed on said support surface (20) and said movement means (19) are configured to allow said mobile platform (12) to slide on said support surface (20), in that

g) sliding means (30) are associated with said mobile platform (12) to allow the latter to slide on said support surface (20), and in that

h) said movement means (19) are configured to allow said mobile platform (12) to translate in a first direction (X) and a second direction (Y), coordinated with respect to the first direction (X), and at least to rotate around a third direction (Z) normal to said support surface (20) and coordinated with respect to the first direction (X) and the second direction (Y)".

Independent claim 1 according to the patentee's first auxiliary request reads as follows (amendments with respect to claim 1 of the main request are underlined or struck through, as appropriate):

"Apparatus to simulate driving a land vehicle comprising a fixed base platform (11), a mobile platform (12) disposed above said base platform (11), a mobile driver's position (13), associated with the mobile platform (12) and in which a driver has his seat during normal use, and movement means (19) associated with the base platform (11) and with the mobile platform (12) to provide the movement of said mobile platform (12) with respect to the base platform (11), characterized in that the base platform (11) is provided with a flat support surface (20), said mobile platform (12) is disposed on said support surface (20) and said movement means (19) are configured to allow said mobile platform (12) to slide on said support surface

(20), in that sliding means (30) are associated with said mobile platform (12) to allow the latter to slide on said support surface (20), and in that said movement means (19) are configured ~~to allow~~ to translate said mobile platform (12) ~~to translate~~ in a first direction (X) and a second direction (Y), coordinated with respect to the first direction (X), and at least to rotate said mobile platform (12) around a third direction (Z) normal to said support surface (20) and coordinated with respect to the first direction (X) and the second direction (Y)".

Independent claim 1 according to the patentee's second auxiliary request differs from claim 1 of the first auxiliary request in that the following features are added at the end of the claim:

"and are suitable to control said three movements on a plane parallel to said support surface (20), and in that said movement means (19) comprise at least three linear actuators (25) associated with the respective ends to said base platform (11) and respectively to said mobile platform (12)".

Independent claim 9 of the second auxiliary request reads as follows:

"Method to simulate driving a land vehicle using an apparatus as in claim 1, which provides that a driver takes his seat in a driver's position (13), associated with a mobile platform (12) that is moved with respect to a lower fixed base platform (11), characterized in that it provides to determine the sliding of said mobile platform (12) on a flat support surface (20) of said base platform (11), by means of sliding means (30) associated with said mobile platform (12) and movement means (19), and in that said mobile platform (12) translates in a first direction

(X) and a second direction (Y), coordinated with respect to the first direction (X), and at least rotates around a third direction (Z) normal to said support surface (20) and coordinated with respect to the first direction (X) and the second direction (Y), wherein said movement means (19) are suitable to control said three movements on a plane parallel to said support surface (20)".

Reasons for the Decision

1. Main request

1.1 Sufficiency of disclosure

The invention as defined in claim 1 is sufficiently disclosed (Article 83 EPC).

1.1.1 According to the opponent, "the patent does not provide an enabling disclosure of a movement means according to feature h) of claim 1" (see also appealed decision, point 2.5). During the oral proceedings before the board, the opponent, with reference to the "motion cueing algorithms" briefly recited in paragraph [0090] of the patent description, submitted that the functioning of the movement means of claim 1, in spite of being technically highly complex, is not further explained in the patent. Therefore, the invention was not sufficiently disclosed.

1.1.2 Despite the burden of proof lying upon the opponent (Case Law of the Boards of Appeal, 10th edition 2022, II.C.9), the opponent did not provide any evidence supporting its objection of lack of disclosure (O1, pages 1 and 2, paragraph with the title "Article 100(b) EPC"). The board does also not see which technical aspect of the movement means would require more technical information to enable the skilled person to implement them. The board,

therefore, agrees with the opposition division and the patentee that the skilled person would be able to implement movement means as defined in feature **h)** of claim 1 for essentially the reasons provided in the appealed decision, points 2.4 to 2.13, referring *inter alia* to document D5 disclosing an algorithm suitable for driving a planar three-degree-of-freedom manipulator. As submitted by the patentee during oral proceedings before the board, complexity alone of the "motion cueing algorithms" does not represent a sufficient reason for denying sufficiency of disclosure of the invention.

1.2 Novelty

The subject-matter of claim 1 lacks novelty in view of document D1 (Article 54(1) EPC).

1.2.1 It is undisputed between the parties that document D1 discloses features **a)** to **g)** of claim 1.

1.2.2 D1 (Figures 1 and 5; [0029] and [0082]) discloses movement means (24, 25) for the horizontal X and Y displacement of the mobile platform comprising a gantry bridge (26), slidably supported at its two transverse ends. The two motors (36, 36') driving separately the two ends of the gantry bridge along the X direction may become out of synchronization, thereby potentially inducing twisting of the gantry bridge. In order to avoid twisting, "the gantry bridge is mounted in a rotatable fashion with respect to the drive elements at each end of the bridge" (appealed decision, point 2.20), allowing the gantry bridge to swing or tilt at a maximum angle of 1 degree. The board agrees with the opposition division that this swinging represents "an example of the movement means being configured to allow the mobile platform (...) to rotate around a third direction (Z) normal to the support surface" (appealed

decision, point 2.20), which corresponds to feature **h)** of claim 1.

In conclusion, since document D1 discloses feature **h)** of claim 1, the subject-matter of claim 1 of the main request is anticipated by D1.

1.2.3 The patentee concedes that document D1 discloses "so-called 'safety' means that in case of fault, lack of synchronism or other operative problem, passively 'allow' the platform to rotate for a limited degree" (P1, page 6, fourth paragraph; original emphasis). However, the patentee's "strong belief is that the safety means of D1 cannot be considered movement means within the meaning of the invention as claimed in the Patent" (P1, page 6, second but last paragraph; original emphasis). For instance, in view of paragraph [0052] of the patent, "the 'safety means' of D1 cannot be able to simulate any 'yawing' movement as in the Patent (P1, page 7, third paragraph). The patentee submits that "the term 'movement means' (...) must define some elements that actively move and drive some other elements, namely that apply a motion force to another element to move it in a determinate direction" (P1, page 7, fourth paragraph).

The board is not convinced by the patentee's argument. First of all, whether the movement means of document D1 are able or not to simulate yawing of a vehicle does not influence the question whether the movement means of D1 fall under the wording of claim 1, because claim 1 does not define movement means for simulating a yawing movement. Secondly, while the board tends to agree with the patentee that the term "movement means" infer "some elements that actively move and drive some other elements", the board concurs with the opponent (O1, page 18, second paragraph) that D1 discloses such active

elements in the form of electric drive motors (39; 43; figures 3 and 4; [0082]) in combination with rotatable hinges (48, 49) at which both ends of the gantry bridge are mounted. Indeed, the electric drive motors of D1 rotate the gantry bridge, and hence the mobile platform (12) of D1, around a third direction normal to the support surface (13) and coordinated with respect to the horizontal directions X and Y (the term "coordinated" has no well-defined meaning; it could simply mean e.g. that the rotation axis is normal to the directions X and Y).

- 1.2.4 During the oral proceedings before the board, the patentee reiterated that the electric drive motors were *linear* drives, and *linear* drives could not induce rotation. Furthermore, hinges were not motion means because they were passive mechanical means that could not induce motion. The switch (50) described in paragraph [0082] of D1 caused an immediate disconnection as soon as a swinging movement of the gantry bridge was detected. In conclusion, the patentee submitted that the movement means of D1 were not configured, as claimed, to rotate a mobile platform around a third direction (Z) normal to the support surface (X, Y).

The board is not persuaded by the patentee's arguments. As submitted by the opponent during the oral proceedings before the board, the two linear drive motors of D1, which slidably support the gantry bridge at its two transverse ends, may become out of synchronisation, causing the gantry bridge to tilt, since the ends of the gantry bridge are hinged to the drive means via hinges (hinges 48, 49; figure 5; [0082]). This tilting is equivalent to a rotation of the mobile platform about a Z-direction normal to the support surface of the mobile platform. It is the combination of linear drive motors and hinges which forms the rotation means. Contrary to the patentee's assertion,

the switch (50) does not immediately disconnect the movement but only when the rotation becomes larger than 1°. In the range between -1° and 1°, a rotational movement takes place.

2. First auxiliary request

The subject-matter of claim 1 of the first auxiliary request lacks novelty in view of document D1 (Article 54(1) EPC).

2.1 Apart from noting that claim 1 of the first auxiliary request now positively recites that the claimed movement means are actually *configured* to translate and to rotate the mobile platform, the patentee put forward essentially the same arguments for novelty as for the subject-matter of claim 1 of the main request.

2.2 In the board's view, as explained in point 1.2.2 above, the combination of the linear drive motors and the hinges of document D1 are also configured to translate and to rotate the mobile platform.

Therefore, the subject-matter of claim 1 lacks novelty with respect to document D1 for essentially the same reasons as the subject-matter of claim 1 of the main request.

3. Second auxiliary request - inventive step

The subject-matter of claims 1 and 9 of the second auxiliary request involves an inventive step (Article 56 EPC).

3.1 Claim 1 of the second auxiliary request differs from claim 1 of the main request *inter alia* in that it comprises

the following feature, designated feature **i)** in the appealed decision, page 15, second paragraph:

feature **i)**: "said movement means (19) comprise at least three linear actuators (25) associated with the respective ends to said base platform (11) and respectively to said mobile platform (12)".

It is undisputed between the parties that feature **i)** is novel in view of document D1, representing the closest prior art (see appealed decision, page 15, second paragraph; point 4.4).

3.2 Inventive step in view of D1 and common general knowledge

3.2.1 During oral proceedings before the board, the opponent presented for the first time an objection of lack of inventive step based on a combination of document D1 and the common general knowledge.

The opponent submitted that linear actuators as claimed were already known from the hexapod (70) shown in D1, figure 2a. Replacing the two linear displacement devices (24, 25) of D1, comprising two linear drives (36, 36') for moving the gantry bridge in the X-direction and one linear drive (51) for moving the base unit with the driver's seat in the Y-direction, by known linear actuators was merely an obvious design decision as to how to move the driver's seat in the X- and Y-directions, which did not involve any inventive step. The opponent further referred to paragraph [0081] of D1 disclosing "further force application points along the gantry bridge". This taught the skilled person to move the gantry bridge in the X-direction by using more than the two linear drives explicitly disclosed in D1, i.e. by using at least three linear drives. Replacing the at least three linear drives by the linear actuators known

from figure 2a of D1 would also lead the skilled person to the apparatus as claimed in an obvious manner.

- 3.2.2 When asked by the board why this new objection was only raised for the first time during the oral proceedings before the board, the opponent explained that when preparing for the oral proceedings it had studied the case again and had realised that according to the board's communication the teaching of D5 would not obviously be combined with document D1 but, on the other hand, that linear actuators were already known from document D1 itself and part of the common general knowledge of the person skilled in the art.

Moreover, according to the opponent, the current objection of lack of inventive step based on a combination of document D1 and the common general knowledge was not a new objection but rather corresponded to the previous objection based on a combination of documents D1 and D5, where D5 was not utilized in the argumentation.

- 3.2.3 The opponent's reasons for raising a new objection only in the oral proceedings are deemed unconvincing by the board. The board's communication was solely based on the objections raised by the opponent earlier and the counter-arguments provided by the patentee and could not have been a surprise to the opponent. Additionally, as stated by the patentee, the board's communication was issued 16 months prior to the oral proceedings, providing the opponent with ample time to submit any new objections in writing before the oral proceedings. Furthermore, the objection based on a combination of document D1 and the common general knowledge is a new objection different from the previous objection based on a combination of documents D1 and D5, since it refers to new alleged facts and to new passages in D1.

3.2.4 In the absence of exceptional circumstances, the board, exercising its discretion under Article 13(2) RPBA, decides that the new objection of lack of inventive step based on a combination of document D1 and the common general knowledge is not taken into account.

3.3 Inventive step in view of a combination of documents D1 and D5

According to the opponent and the opposition division, the objective technical problem solved by feature **i)** could "be regarded as how to simplify the system of D1 and reduce the costs thereof" (appealed decision, point 4.4). The opposition division concluded that "the skilled person would, when starting from the first embodiment of D1 and wishing to simplify it by reducing weight and costs, find document D5 and incorporate the teaching therein by replacing the horizontal displacement means in D1 with the three linear actuators of D5, thereby arriving at the claimed subject-matter in an obvious manner" (appealed decision, point 4.5).

3.4 The board is not convinced by this reasoning of lack of inventive step for the following reasons:

3.4.1 D1 discloses three embodiments of horizontal displacement means using, respectively, a gantry bridge moved by two belt traction drives or by electric linear drives (see e.g. D1, [0019] to [0032] and [0064] to [0085]; Figures 1a to 6b), means of belt traction which cross over (D1, [0033] and [0086] to [0088], Figures 7a and 7b) or an electromagnetic planar drive (D1, [0034] and [0089], Figures 8a to 8c). As noted by the patentee "if the technical problem would have been that of simplifying and reducing weight and the mass of the bulky system of the

first embodiment of D1 [i.e. the gantry bridge], then the solution was already provided by the other two embodiments of D1 itself, and the skilled person would have not [*sic*] looked to a completely different solution, as that provided by D5. It is not reasonable to think that the person skilled in the art, starting from one or the other of the three embodiments of D1, and trying to solve a technical problem not well identified, would have completely replaced the linear displacement devices and the rotary plate with the three-actuators system" (P1, page 11, second and third but last paragraphs).

As further stated by the patentee, "replacing the movement system of D1 with the movement system of the Patent implies a complete re-arrangement of all the components, since not a single component of the systems of D1 could be maintained and/or is compatible with the movement system of the Patent" (P1, page 12, second but last paragraph). In the board's view, a complete rearrangement of a complex prior-art system as the one of document D1 cannot be considered to be obvious, if there are no strong and straightforward reasons for the skilled person to do so. Such reasons are missing in the present case.

- 3.4.2 The gantry bridge and the three associated linear drives of document D1 have the task to move a test vehicle in two horizontal directions X and Y. In addition, the horizontal rotation of the test vehicle around a Z-axis is executed in D1, Figure 2a, by a dedicated rotary plate (8), independently from the gantry bridge and the linear drives. "Thus the skilled person would not contemplate removing the rotary plate" (appealed decision, page 16, penultimate paragraph). Since in D1 the rotary movement of the mobile platform is already provided by a separate rotary plate, the board sees no obvious reason why the skilled person would have replaced the gantry bridge and

the three associated linear drives of document D1 by three linear actuators as claimed, i.e. associated with the respective ends to the base platform and the mobile platform.

Indeed, as discussed during the oral proceedings before the board, in the board's view the expression in claim 1 "three linear actuators (25) associated with the respective ends to said base platform (11) and respectively to said mobile platform" means that one end of an actuator is associated with one platform and the other end of the actuator is associated with the other platform. This implies that the ends of each actuator are functionally associated with distinct platforms, namely with a fixed platform and with a mobile platform, respectively.

3.4.3 D1 discloses an actuating system for a vehicle motion simulator. In order "to simulate a multiplicity of possible driving maneuvers under conditions which are close to reality (...), large movement areas are required in particular for representing low-frequency excitations. In the present example, an X-Y movement area 15 of 40m x 40 m was selected" (D1, [0061]). The board does not see how simple linear actuators such as those in D5 can move a vehicle over such a large area. As the 40m x 40m area is a strong requirement in the realisation of the D1 simulator (see D1, [0016]: "the horizontal displacement device must span the largest possible distances"), it is not an obvious option for the skilled person to reduce this large area to make it compatible with linear actuators.

3.4.4 As stated by the patentee (P1, page 13, second paragraph), "figure 5 [of D5] could represent the theoretical concept of having three actuators able to move an object". However, it was clear that the system disclosed in D5 "is

a 'laboratory' theoretical concept completely missing any contact with a real and practical industrial application" (P1, page 13, fifth paragraph).

3.5 The opponent's counter-arguments are not found convincing.

3.5.1 In the opponent's view, "D5 is in the same technical field as D1" and, therefore, "[t]he skilled person would look to D5 for teaching of how to simplify the driving simulator of D1" (O1, page 15, last paragraph).

While it is briefly mentioned in the last sentence of the penultimate paragraph of D5 that "[o]ther applications are planar motion simulators", the board is not convinced that this succinct, unique and general mentioning of "planar motion simulators" constitutes a sufficient incentive for the skilled person to consider the teaching of document D5 at all. For the reasons provided in points 3.4.3 and 3.4.4 above, the board is of the opinion that the teaching of D5 is not readily applicable, if at all, to the driving simulator of D1.

3.5.2 The opponent explained that the skilled person, looking for a simplified actuating system to replace the gantry bridge of D1, would not have selected one of the two further embodiments disclosed in D1 because these two further embodiments were even more complex and/or expensive than the gantry bridge embodiment (O1, page 19, second paragraph). During the oral proceedings before the board, the opponent referred to paragraphs [0088] and [0089] of D1, mentioning that the embodiment with the belt traction design "is a more complex system" than the gantry design. The third embodiment, i.e. the electromagnetic planar drive design, would also be more complex than the gantry bridge design because every single magnetic coil had to be controlled individually.

In the board's view, each of the three embodiments of D1 has its specific advantages and disadvantages. Depending on the exact circumstances and desires of the designer of the simulator of D1, the skilled person would have chosen the most appropriate technology among the three options for moving a test vehicle before considering looking for new option, if at all.

3.5.3 According to the opponent, the presence of the rotary plate 8 of D1 would not withhold the skilled person from implementing three linear actuators as disclosed in D5 (O1, page 19, second but last paragraph to page 20, third paragraph). As reiterated during the oral proceedings before the board, the opponent was of the view that the most obvious solution for the skilled person would have been to retain the rotary plate in D1.

As explained in point 3.4.2 above, under the assumption that the skilled person would have considered to implement linear actuators in the simulator of D1, he would have considered implementing two linear actuators for providing the movement in the X and Y direction, respectively, but not three linear actuators as claimed, i.e. associated with the respective ends to the base platform and the mobile platform. Furthermore, under the assumption that the skilled person would have considered to implement three linear actuators in the simulator of D1, he would have had to consider what to do with the rotary plate of D1. On the one hand, the use in D1 of three actuators as claimed and the subsequent removal of the rotary plate 8 of D1 would represent a further step in the complete modification of the system of document D1, which is not within reach of the abilities of the skilled person. Moreover, as submitted by the patentee (P1, page 12, fifth and sixth paragraphs), the rotary plate 8 of D1 allows

various advantageous modes of operation of the driving simulator of D1 which are not obtainable with the three-actuator system of claim 1. Therefore, the removal of the rotary plate 8 is not an obvious option. On the other hand, the use in document D1 of three actuators as claimed and the retention of the rotary plate of D1 would provide redundant means of rotating the mobile platform, which would neither simplify the system nor reduce costs, contrary to the objective technical problem to be solved.

3.6 Independent method claim 9 comprises all the method features corresponding to the features of claim 1. Therefore, the method of claim 9 involves an inventive step for reasons analogue to those given above for the apparatus of claim 1.

4. The opponent did not object to dependent claims 2 to 8 and the board sees no reason to doubt that they meet all the requirements of the EPC.

It follows that claims 1 to 9 of the present second auxiliary request meet the requirements of the EPC and that a patent can be granted on the basis thereof.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent as amended in the following version:

Claims: Nos. 1 to 9 of auxiliary request 2 filed during the oral proceedings of 10 April 2024

Description: Pages 2 to 6 filed during the oral proceedings of 10 April 2024

Drawings: Pages 10 to 16 of the patent specification

The Registrar:

The Chairman:



L. Gabor

R. Bekkering

Decision electronically authenticated