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**Datasheet for the decision
of 12 November 2021**

Case Number: T 2196/17 - 3.2.01

Application Number: 13170753.1

Publication Number: 2674349

IPC: B62D13/02

Language of the proceedings: EN

Title of invention:

Semi-trailer with adjustable steering

Patent Proprietor:

Broshuis B.V.

Opponent:

Scheuerle Fahrzeugfabrik GmbH

Headword:

Relevant legal provisions:

EPC Art. 56

RPBA 2020 Art. 13(1)

Keyword:

inventive step (no)

admissibility of auxiliary requests (no)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 2196/17 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 12 November 2021

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 4 August 2017
revoking European patent No. 2674349 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: C. Narcisi
S. Fernández de Córdoba

Summary of Facts and Submissions

I. The European patent No. 2 674 349 was revoked by the decision of the Opposition Division posted on 4 August 2017. Against this decision an appeal was lodged by the Patentee in due form and in due time pursuant to Article 108 EPC.

II. Oral proceedings were held on 12 November 2021. The Appellant (Patentee) requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or, in the alternative, that the patent be maintained in amended form on the basis of auxiliary request 1 (filed with the notice of appeal on 3 October 2017) or auxiliary requests 2, 3 or 4 (filed with letter of 8 July 2020). The Appellant withdrew the request for reimbursement of the appeal fee.
The Respondent (Opponent) requested that the appeal be dismissed.

III. Claim 1 as granted reads as follows:

"Semi-trailer (1) comprising at least one steerable axle, and a coupling comprising a kingpin (8), for coupling a semi-trailer (1) to a tractor (2) by means of a fifth wheel coupling (3), and a steering wedge (9) and attached to it a steering actuator that is connected to a steering device for steering the at least one steerable axle, wherein the steering wedge (9) and the steering actuator both are rotatable around the kingpin (8), wherein the steering actuator is mounted to an adjustment device that is arranged to adjust the distance of the steering actuator to the

kingpin (8), characterized in that the semitrailer is extendable and the adjustment device is arranged for adjusting the distance from the steering actuator to the kingpin for adjustment of the steering behaviour to the changed length of the semitrailer, and comprises means to lock the distance set."

Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that the wording "the semitrailer is extendable and the adjustment device is arranged for adjusting the distance" is replaced by the wording "the semitrailer is an extendable semitrailer and the adjustment device is arranged for adjusting the distance".

Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the wording "the semitrailer is extendable, and the adjustment device is arranged" is replaced by the wording "the semitrailer is an extendable semitrailer, wherein when the extendable semi-trailer is being extended or is being pushed in, then not only the length of the semi-trailer is changing, but with the length also the amount of steering required, and that the adjustment device is arranged".

Claim 1 of auxiliary request 3 differs from claim 1 of auxiliary request 2 in that the wording "from the steering actuator to the kingpin" is replaced by the wording "from the steering actuator to the kingpin such that, with the same steering angle between the tractor and the extendable semi-trailer, the at least one axle will receive a different steering angle".

Claim 1 of auxiliary request 4 differs from claim 1 of auxiliary request 3 in that the wording "for adjustment

of the steering behaviour to the changed length of the semi-trailer" is replaced by "for adjustment of the steering behaviour to the changed length of the semi-trailer without the change of length of the semitrailer requiring constructive changes or adaptations".

IV. The Patentee's arguments may be summarized as follows:

The subject-matter of granted claim 1 involves an inventive step over document D1 (EP-A1-390 288) in view of further document D2 (DE-A-1 957 662).

The subject-matter of claim 1 differs from the known semi-trailer of D1 in that features F11 (i.e. "the semitrailer is extendable and"), F12 (i.e. " the adjustment device is arranged for adjusting the distance from the steering actuator to the kingpin for adjustment of the steering behaviour to the changed length of the semitrailer, and") and F13 (i.e. "comprises means to lock the distance set") are not known therefrom.

Firstly, feature F11 is not fulfilled in D1 since an extendable semi-trailer allows to change its length without requiring constructional changes, which is not disclosed in D1. Consequently, features F12 and F13 (considered in conjunction with feature F11) implying adjusting said distance (between the steering actuator and the kingpin), in conformity with the changed length of the semitrailer and locking the set distance, are not derivable from D1.

Moreover, the slide valve 33 in D1 does not represent locking means as implied by feature F13, said valve being controlled by a computer, which renders locking the distance between the sliding block 16 and the pivot (kingpin) impossible. In effect, according to D1 the control by the computer 32 inhibits the control slide valve 33 from locking cylinder 10 because the control

slide valve 33 is dynamically controlled by the computer 32 to perform the "on the fly" error correction (i.e. continuous control) which corrects the angle if the measured trailer axle angle does not have the appropriate value for the respective tractor steering angle.

The combination of D1 and D2 would not be obvious for the skilled person and would anyway not lead to the subject-matter of claim 1.

In view of the objective problem underlying the invention (i.e. "how to make a semi-trailer suitable for loads having a variety of lengths without compromising its steering behaviour and safety") the skilled person would not have any incentive to consult D2, for various reasons.

In the first place, D2 is not directed to and does not even mention extendable semitrailers (feature F11). Secondly, D2 does not suggest the use of an extendable semi-trailer and does not suggest an adjustment device for adjusting said distance and locking means to lock said distance according to features F12 and F13. Thus, even on the assumption that the skilled person would combine D1 and D2, this would not lead to the subject-matter of claim 1.

In addition, the combination of D1 and D2 would not be obvious and not even advantageous, D1 and D2 disclosing two incompatible, different kinds of control systems for controlling the steering behaviour of the semi-trailer. In effect, D1 discloses a hydraulic control of the steering cylinders (acting on the steering axle), with only an indirect electronic correction which operates on the input to the hydraulic circuit, i.e. on the position of the lever element (not on the steering cylinders). On the contrary, D2 implements a fully

electronic control directly on the steering cylinders. Therefore, applying the teaching of D1 to D2 would lead to a loss of flexibility (i.e. not having any more any desired steering angle; D2, page 2, first paragraph; page 3, last paragraph) in the control system of D2, and applying the teaching of D2 to D1 would lead to the drawbacks mentioned in D1 (i.e. vulnerability of the sensors, power unit of large capacity, risk of loss of trailer control; D1, column 1, lines 33-42).

Auxiliary requests 1 to 4 should be admitted into the appeal proceedings since they comply with the relevant criteria according to Article 13(1) RPBA (Rules of Procedure of the Boards of Appeal) 2007, or Article 13(1) RPBA 2020 insofar as applicable. In particular, the subject-matter of claim 1 of these requests does not introduce complex items for discussion and moreover overcomes the outstanding objections on inventive step, for it includes additional features further differentiating it from prior art D1 and D2, and likewise contributing to inventive step.

Specifically, in claim 1 of the auxiliary requests it is further specified that "the semi-trailer is an extendable semi-trailer" (auxiliary requests 1 to 4), and that "when the extendable semi-trailer is being extended or is being pushed in, then not only the length of the semi-trailer is changing, but with the length also the amount of steering required" (auxiliary requests 2 to 4), and that "with the same steering angle between the tractor and the extendable semi-trailer, the at least one axle will receive a different steering angle" (auxiliary requests 3 to 4), and it is also specified "without the change of length of the semitrailer requiring constructive changes or adaptations" (auxiliary request 4).

These features thus further define the extendable semi-trailer and the control system for controlling the steering behaviour of the semi-trailer.

V. The Opponent's arguments may be summarized as follows:

The subject-matter of granted claim 1 (main request) is not inventive over D1 and D2.

Contrary to the Appellant's view, feature F11 is at least obvious in view of D1, D2, while features F12, F13 are known from D1.

In effect, feature F12 is derivable from D1, stating that "the ratio between angle A and B depends on several factors, such as the instantaneous magnitude of angle A and the type and number of axles of the trailer" (D1, column 1, lines 20-25), wherein A and B, respectively, represent the steering angle of the tractor and the trailing angle of the trailer axis. Thus D1 teaches that the trailing angle B not only depends on the steering angle A, but likewise on the type and number of axles of the trailer, i.e. on the length of the semitrailer and the distance between the axles of the trailer and the tractor.

As to feature F13, D1 discloses in figure 1 a 4/3-way valve having a central locked position allowing to lock the set distance between the steering actuator and the kingpin. This locked neutral position is fixed in the 4/3-way valve of D1, since D1 does not disclose a continuous or "on the fly" control of said valve by the control unit (computer), D1 disclosing merely a simple computer correction of the trailing axle angle B as determined by the hydraulic steering actuator.

As to feature F11, D1 explicitly mentions that the steering device of D1 may be used in a semitrailer having hydraulic steering cylinders at the trailer axle, as is the case in the steering device and semitrailer of D2 (see D1, column 2, lines 32-42) and also refers to D2 as closest prior art (D1, column 1, lines 1-15). Thus, no incompatibility exists between the technical teachings of D1 and D2, D1 merely representing further technical development of the device disclosed in D2.

It ensues that the skilled person reading D1 would in an obvious manner envisage a combination with D2 and thereby arrive at feature F11, given D2 disclosing specific use of its steering device in an extendable semi-trailer (see D2, page 2, first paragraph : "mit dieser Elektronik lassen sich je nach Länge des Fahrzeugs die Winkelstellungen der Hinterachspartien so einstellen, dass die Kurvenläufigkeit des Sattelzuges stets gewährleistet ist"; i.e. "this electronic control allows to adapt, depending on the length of the vehicle, the angular position of the trailer's rear axles such that smooth driving along the curve is ensured").

The auxiliary requests should not be admitted into the appeal proceedings, as they do not overcome the outstanding objections on inventive step, given the additional features merely concerning generally known properties of the semitrailer and of the steering control.

Reasons for the Decision

1. The appeal is admissible.

2. The subject-matter of claim 1 (main request) does not involve an inventive step in view of D1 and D2 (Article 56 EPC).

The features according to the preamble of claim 1 are undisputedly known from D1, therefore only features F11, F12 and F13 will be discussed.

As to feature F12 (i.e. "the adjustment device is arranged for adjusting the distance from the steering actuator to the kingpin for adjustment of the steering behaviour to the changed length of the semitrailer, and"), it is considered that this feature is known from D1, this document stating that "the ratio between angle A and B depends on several factors, such as the instantaneous magnitude of angle A and the type and number of axles of the trailer" (D1, column 1, lines 20-25), wherein A and B, respectively, represent the steering angle of the tractor and the trailing angle of the trailer axis. Given that the number of axles of any trailer or semitrailer depends on its length, it is evident that the ratio between angle A and B depends also on the length of the trailer or semitrailer.

Moreover it is clear that in use (i.e. while driving), the trailer's (or semitrailer's) "changed length" has to be fixed, and the steering device of D1 is apt for use specifically with a trailer or with a semitrailer of a given "changed" but fixed length (the amount of change being certainly limited and anyway not indicated in claim 1 and in the contested patent's specification), since "in computer 32, a ratio line which is ideal for the trailer in question is stored, which gives an optimum trailer axle trailing angle B associated with any tractor steering angle A, and also a pivot angle X of lever element 18 corresponding to

the trailer axle angle" (see D1, column 4, lines 50-56). Evidently, as mentioned before, the wording "the trailer in question" entails known types of trailers with given number of axles and lengths, the steering device of D1 thus being apt for use with extendable semitrailers whose length has been fixed during use.

Hence feature F12 is known from D1.

As to feature F13 (i.e. "comprises means to lock the distance set"), the Board concurs with the Respondent's view that in figure 1 of D1 a 4/3-way valve is disclosed, for actuating hydraulic cylinder 10 operating steering actuator 16 (i.e. sliding block 16 transmitting the rotation of the tractor's coupling plate 1 to lever element 18 in an angular ratio depending on the instantaneous position of sliding block 16 in guide slot 17), for adjusting its distance to the kingpin 2. This valve is shown in its central neutral position, which is generally known to the skilled person to be a locked position in which no fluid flow is possible. This is also the only reasonable interpretation of the valve's function, given the mentioned steering ratio between steering angle A and trailing axle angle B being (for safety reasons) necessarily fixed and the steering actuator locked when driving along a curve.

Moreover, contrary to the Appellant's view, no continuous (closed loop) control (or "on the fly" control) for the steering behaviour of the trailer can be derived from D1 (thus confirming that the neutral central position of aforesaid 4/3-way valve is locked).

First, as also submitted by the Respondent, there is no need for a continuous control since the trailer's (or semitrailer's) length is fixed in use.

Further, the steering ratio (as determined by steering angle A and trailing axle angle B) is also fixed when driving along a curve, at least after effectuating (if necessary) a correction of the position X of lever element 18 corresponding to the trailer axle angle (D1, column 2, line 49-column 3, line 3). The correction occurs only if the sensor 32 determines that the lever element's 18 angular position does not correspond to the ideal angular position X (as determined by the stored ideal ratio line for the trailer in question) (see D1, column 4, line 51-column 5, line 8). In this case the adjustment device 7,8,9,10 (adjusting means for the transmission) is steered to correct the angular position of the lever element 18. This correction requires little power only (D1, column 2, lines 21-28; column 1, lines 13-17), and is necessarily a simple one-off correction. Indeed, it could not result from a continuous control requiring the pump to continuously provide pressurized hydraulic medium in order to keep the steering actuator 16 and lever element 18 in their intended defined position (and to constantly correct their position, if the sensed position does not correspond to the defined position), since this would imply a considerably higher power and energy need, contrary to the teaching of D1, and would not make sense in the technical context of D1.

In effect, a continuous control of the steering behaviour (i.e. of the trailing axle angle B) would operate constantly and at any time in parallel to and simultaneously with the hydraulically operated steering device and adjustment device of D1, which is powered to a greater part by the rotation of the tractor relative to the trailer (D1, column 2, lines 13-21). Thus, a

continuous control would render needless and superfluous said hydraulic-mechanical adjustment mechanism substantially controlled and powered by the rotation of the tractor relative to the trailer (D1, column 2, lines 21-28). In addition, at the same time, it would nullify the main advantage provided by the control system of D1, i.e. reducing energy consumption and power need, such that "no power unit is needed on the trailer, because the greater part of the power needed for steering the trailer axle is provided by the rotation of the tractor relative to the trailer" (D1, column 2, lines 13-17).

Finally it is noted that the level of precision and accuracy implied by a continuous control is certainly not required in the steering device according to D1, for D1 states explicitly that "if, in the device according to this invention, the control for the adjusting means fails, the trailing angle at the trailer axle is not ideal, it is true, but does have the correct order of magnitude" (D1, column 3, lines 40-45).

In view of the above reasons it is concluded that feature F13 is known from D1.

As to feature F11 ("the semitrailer is extendable and"), admittedly D1 does not explicitly contemplate to apply its steering device specifically to an extendable semitrailer, however its use in conjunction with extendable semitrailers is suggested to the skilled person in D1. In particular, from the aforementioned passages (stating that "the ratio between angle A and B depends on several factors, such as the instantaneous magnitude of angle A and the type and number of axles of the trailer" (D1, column 1, lines 20-25) and that "in computer 32, a ratio line which is ideal for the

trailer in question is stored" (D1, column 4, lines 50-52)) the skilled person would understand that any kind of trailer is addressed, thus including also known extendable semitrailers, for which the steering device of D1 is apt for use (see above). Further, the skilled person would consult D2 since it is cited in D1 (D1, column 1, line 15; column 2, line 39) and constitutes its closest prior art. D2 explicitly states (see above) that its "electronic control allows to adapt, depending on the length of the vehicle, the angular position of the trailer's rear axles such that smooth driving along the curve is ensured".

Therefore the skilled person would consider in an obvious manner to use the steering device of D2 in conjunction with trailers of different lengths and also with (undisputedly) commonly known extendable semitrailers, if e.g. the different nature and various lengths of the loads so requires.

The skilled person would also obviously realize that this also applies for the steering device of D1, similarly to that of D2 including hydraulic steering means at the trailer axle (see D1, column 2, lines 32-42) (as pointed out by the Respondent and contrary to the Appellant's view) and the steering device of D1 likewise including a similar electronic control, albeit being used only for correction of the position of said lever element 18, this being the only substantial difference since the electronic control of D2 acts through a hydraulic circuit directly on the hydraulic steering means at the trailer axle.

However, said lever element 18 (being mainly and substantially powered only by the rotation of the tractor relative to the trailer, in order to allow for said advantageous reduced power and energy need (see

above discussion)) does not affect in the least the mentioned substantial constructional and functional similarities and analogies.

Above all and most importantly, it is obvious for the skilled person that both in D1 (see cited passage, column 4, lines 50-56) and D2 (see cited passage, page 2) the electronic unit necessarily includes the data concerning the specific kind of trailer and ideal ratio line between tractor steering angle A and trailing axle angle B.

Hence the skilled person would in an obvious manner, as for the steering device of D2, likewise apply the steering device of D1 in conjunction with extendable semitrailers, if, as mentioned, the different nature and various lengths of the loads so requires. Thereby the skilled person would arrive in an obvious manner at the subject-matter of claim 1.

3. Claim 1 of auxiliary request 1 likewise does not meet the requirements of inventive step (Article 56 EPC) for the above mentioned reasons, given that the amendment stating that "the semitrailer is an extendable semitrailer" does not change the subject-matter of granted claim 1 as discussed hereinabove.

4. The Board did not admit auxiliary requests 2 to 4 pursuant of Article 13 (1) RPBA 2020, which applies to all appeals pending on or filed after the date of entry into force (1 January 2020) of the Rules of Procedure of the Boards of Appeal 2020 (Article 25, Transitional Provisions, (1), (3)).
These requests were late filed, i.e. after filing the grounds of appeal, and the Board decided to exercise its discretionary power not admitting these auxiliary requests, for they did not prima facie overcome the

outstanding inventive step objections. In particular, the amendments introduced into claim 1 of these auxiliary requests relate to generally known features of (extendable) semitrailers and to generally known features derivable e.g. from the steering control such as known from D1 or D2. Based on the submissions of the parties the Board concluded that it was not prima facie evident that these features in combination with the remaining features of claim 1 involved an inventive step.

It is noted that applying Article 13 (1) RPBA 2007 (Rules of procedure of the Boards of Appeal in force before 2020) would not lead to a different conclusion since under this Article the Appellant's auxiliary requests (filed after the grounds of appeal) would likewise be considered as late filed and since the criterion of prima facie allowability of late filed requests constitutes part of the established case law of the Boards of Appeal in respect of this Article likewise (see e.g. T 119/15, T 924/17).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Voyé

G. Pricolo

Decision electronically authenticated