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**Datasheet for the decision  
of 13 September 2016**

**Case Number:** T 1368/15 - 3.2.01

**Application Number:** 02016633.6

**Publication Number:** 1279585

**IPC:** B62D5/04, B62D5/06, B66F9/24

**Language of the proceedings:** EN

**Title of invention:**  
Steering apparatus in vehicle and industrial vehicle

**Patent Proprietor:**  
KABUSHIKI KAISHA TOYOTA JIDOSHOKKI

**Opponent:**  
STILL WAGNER GmbH

**Headword:**

**Relevant legal provisions:**  
EPC Art. 56  
EPC R. 103(1)

**Keyword:**  
Inventive step (no)  
Reimbursement of appeal fee (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
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Case Number: T 1368/15 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 13 September 2016**

**Appellant:** KABUSHIKI KAISHA TOYOTA JIDOSHOKKI  
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**Respondent:** STILL WAGNER GmbH  
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**Representative:** Geirhos, Johann  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 4 May 2015  
revoking European patent No. 1279585 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman** G. Pricolo  
**Members:** C. Narcisi  
O. Loizou

## **Summary of Facts and Submissions**

- I. European patent No. 1 279 585 was revoked by the decision of the Opposition Division posted on 4 May 2015. Against this decision an appeal was lodged by the Patentee on 6 July 2015 and the appeal fee was paid at the same time. The statement of grounds of appeal was filed on 28 August 2015.
  
- II. Oral proceedings were held on 13 September 2016. The Appellant (Patentee) requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the set of claims of the sixth auxiliary request, as filed on 11 March 2015 during opposition proceedings, corresponding to the sixth auxiliary request as filed on 21 March 2013 during oral proceedings before the Board of Appeal (main request), or, in the alternative, on the basis of the set of claims of said sixth auxiliary request and amended page 6 of the description of the patent specification. The Appellant further requested the reimbursement of the appeal fee. The Respondent (Opponent) requested that the appeal be dismissed.
  
- III. In the decision under appeal, the Opposition Division came to the conclusion that the subject-matter of claim 1 according to said sixth auxiliary request was novel but not inventive over the steering apparatus disclosed by a public prior use.
  
- IV. Claim 1 of the sixth auxiliary request reads as follows:  
  
"A full-electric type steering apparatus for a vehicle, the steering apparatus has a manipulator (17), which

can be rotated with no maximum turning limits in either right or left directions, the manipulator being a steering wheel (17) having a knob (18), a steered wheel (16) being steered in a steered range, which is between two predetermined end positions, a first detector (26), wherein the first detector (26) detects operation of the of the manipulator (17) and outputs a signal representing the detection result, a driving device (36) for generating a driving force to steer the steered wheel (16), the driving device (36) being a motor, a second detector (39), wherein the second detector (39) detects at least one of two states of the steered wheel (16) and outputs a signal representing the detection result, wherein, in one of these states, the steered wheel (16) is at either of the end positions, and wherein, in the other state, the steered wheel (16) is deviated from either of the end positions, and a controller (22) for controlling the driving device (36), wherein the controller (22) causes the driving device (36) to steer the steered wheel (16) in accordance with the signal from the first detector (26), and wherein, when the steered wheel (16) reaches either one of the end positions according to the operation of the manipulator (17), the controller (22) causes the driving device (36) to stop steering motion of the steered wheel (16) based on the signal from the second detector (39) and executes a hold control routine which causes the driving device (36) to hold the steered wheel (16) at the end position, wherein when the steered wheel (16) is deviated from the steered range during execution of the hold control routine as a consequence of an external force applied to the steered wheel even though the steering wheel (17) is not operated, the controller (22) causes the driving device

(36) to move the steered wheel back to the corresponding end position, characterized in that when the steered wheel (16) is deviated toward a straight-move position from the end position during the hold control routine as a consequence of an external force applied to the steered wheel even though the steering wheel (17) is not operated, the controller (22) causes the driving device (36) to move the steered wheel back to the corresponding end position, when the manipulator (17) is operated toward a straight-move position during execution of the hold control routine, the controller (22) cancels the hold control routine so that the steered wheel (16) is steered according to the operation of the manipulator (17), two blocks (53a, 53b) are each provided at a body (2) of the vehicle corresponding to a position of a supporting member (38a) supporting the steered wheel (16), said supporting member (38a) having a stopper adapted to contact either of the blocks (53a, 53b) for mechanically stopping the steering motion of the steered wheel (16) when the steered wheel (16) is turned beyond either of the end positions by a predetermined angle."

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

The subject-matter of claim 1 is new and inventive over the steering apparatus disclosed by the public prior use. In particular, the features implying that the apparatus comprises "a manipulator, which can be rotated with no maximum turning limits in either right or left directions" (hereinafter designated as features (i)) and the features (present in both the preamble and the characterizing portion of the claim) concerning the

"hold control routine" (hereinafter designated as features (ii)) are not known from said prior use and would not be obvious for the skilled person. As to features (i) they entail the advantage that even though (in a full-electric steering apparatus) the steering wheel can well be rotated beyond the end positions by a given angle (the steered wheel being by contrast stopped at the respective end position), the steered wheel is nevertheless immediately responsive to rotation of the steering wheel in the opposite direction (towards straight-forward motion), without previous backward rotation of the steering wheel by the aforesaid angle. These features are clearly derivable from the patent specification (hereinafter referred to as EP-B; see paragraph [0048], lines 25-34) and they are not suggested by the available prior art. These features might be regarded as necessary to meet safety concerns (i.e. the steered wheel should always be promptly responsive to the steering wheel) but they do not result in an obvious manner from safety considerations, given that various different solutions are possible. In the present case the implementation of features (i) can be performed e.g. using a rotary encoder or a digital potentiometer as a sensor detecting the rotation of the steering wheel.

Concerning features (ii) the cited prior art does not suggest devising a "hold control routine" which causes the steered wheel to go back to the end position (as set by by the position of steering wheel) if it is deviated from this direction by the action of an external force (such as e.g. a stone), where this is done by constantly comparing (at predetermined time intervals) the position of the steered wheel (as detected by sensor 39) with said set end position, without detecting and reading each time anew the

position of the steering wheel. Thus, time is advantageously saved. The "hold control routine" is cancelled once the steering wheel is turned again in a different direction by the operator (as detected by sensor 26). Finally, the "hold control routine" allows driving the steered wheel near the end positions without reducing the turning speed. Consequently the object of the invention is attained, i.e. responsiveness of the apparatus is improved (EP-B, paragraph [0010]).

In conclusion, from features (i) and (ii) the presence of an inventive step is inferred.

According to the further auxiliary request page 6 of the description was amended to avoid inconsistencies or contradictions with claim 1, which is identical to claim 1 of the sixth auxiliary request.

Reimbursement of the appeal fee is requested on account of a fundamental procedural violation concerning denial of the right to be heard. This is due to the fact that the reasons (indicated in the appealed decision) as to why the alleged advantages of the invention were not considered to be applicable or relevant were not made known to the Appellant during the oral proceedings.

VI. The Respondent's arguments may be summarized as follows:

The subject-matter of claim 1 is not inventive over the steering apparatus according to the public prior use. In effect, feature (i) would be obvious for the skilled person since the steering apparatus of the public prior use is likewise of a full-electric type, in which this technical feature would be naturally and conveniently applied. Also, for safety reasons such a technical



measure would be necessary in order that the steered wheel respond promptly to the steering wheel. Feature (ii) cannot involve an inventive step either, for it is not apparent in which way through the use of said "hold control routine" the control of the steered wheel is affected, let alone improved with respect to the public prior use, which also discloses a full-electric (closed loop) control of the steering apparatus.

### **Reasons for the Decision**

1. The appeal is admissible.
  
2. The subject-matter of claim 1 (of the sixth auxiliary request) does not involve an inventive step with regard to the steering apparatus of the public prior use. It is undisputed by the parties that the claimed subject-matter distinguishes from the apparatus according to the prior use by said features (i) and (ii). In relation to features (i) the Board concurs with the Respondent's view that in a full-electric steering apparatus as disclosed by the prior use it would be completely obvious and natural for the skilled person to install a steering wheel (or "manipulator") which can be turned without limits (according to features (i)), given that the use of e.g. a rotary encoder, as well known to the skilled person, anyway allows to detect if the steering wheel attains the turning angle corresponding to the maximum turning angle of the steered wheel and emits a corresponding warning signal or information. Consequently, any angle exceeding said angle would therefore not affect the steered wheel and would also not be taken into account when the steered wheel is turned in the backward (opposite) direction, thus allowing the steered wheel in any event to promptly respond to a rotation of the steering wheel in

any direction. Further, as discussed during oral proceedings (see above), features (ii) or any equivalent technical measures would anyway be necessary to avoid safety concerns. Therefore, even in this respect features (ii) would be obvious for the skilled person, for otherwise mechanical stops would have to be provided for the steering wheel as turning limits. This however would be a much less obvious solution in a steering apparatus of full-electric type.

As to features (ii) the Respondent correctly pointed out that an electronic steering (closed loop) control ("elektronischer Lenkregler") is known from the public prior use (see for instance workshop manual W1, pages B2, B6, B14). Such a control, analogue or digital as the case may be, inevitably includes a closed loop for making the difference approach zero between set turning angle (as set by the operator through rotation of the steering wheel) and the corresponding actual turning angle (as measured by a sensor detecting the steered wheel's position). It is self-evident that said difference will be made to (iteratively) approach zero by said control loop if any deviations occur, possibly due for instance also to external forces. That is, the steered wheel's turning angle is kept at the respective set end position. This situation stays unchanged as long as the input signal to the loop (i.e. the set rotation angle of the steering wheel) does not change. Thus, each time at the start of the loop the input signal is necessarily checked and (if no change occurred) the difference is built with the detected signal (from the steered wheel) according to the public prior use. Therefore it would be obvious for the skilled person in a digital control circuit (software program) to use within the loop the same (stored) input signal (without each time reading the input anew from

the main program), as long as it is checked at the start of the loop that no change occurred in the input signal (thus the advantage alleged by the Appellant, though not clearly and unambiguously derivable from claim 1, would anyway in fact be obvious for the skilled person). This evidently automatically occurs in an analogue control circuit where the input signal ("Sollwert") is continuously and constantly fed to the inner loop. If the input signal representing the set angular position of the steering wheel is changed (by the operator), then the loop is quit and the steered wheel is again controlled according to the operation of the "manipulator" (steering wheel) as set by the operator. In conclusion, said features (ii) are therefore rendered obvious by all the mentioned control steps known from the public prior use (as derivable from any closed loop control), for the aforesaid steps performed in the closed loop of the control clearly amount to those performed by the "hold control routine" as defined in claim 1.

For the reasons set out above the subject-matter of claim 1 lacks an inventive step over the public prior use (Article 56 EPC).

The same applies to claim 1 of the further auxiliary request which is identical with claim 1 of the sixth auxiliary request. In fact, the amendments made to the description, aimed solely at excising some specific embodiments, do not change the claimed subject-matter (which still is so formulated as to encompass the excised embodiments).

3. In accordance with Rule 103(1) EPC, a prerequisite for the reimbursement of the appeal fee is that the appeal be allowed. This not being the case here, the request for reimbursement of the appeal fee must be dismissed.

## Order

### For these reasons it is decided that:

1. The appeal is dismissed.
2. The request for reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated