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Datasheet for the decision of 29 February 2012

Case Number: T 0699/10 - 3.2.01

Application Number: 07734711.0

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Language of the proceedings: EN

Title of invention:
Car steering system

Applicant:
FERRARI S.p.A.

Headword:
-

Relevant legal provisions (EPC 1973):
EPC Art. 84, 56, 54

Keyword:
"Clarity (yes)"
"Novelty and Inventive step (yes, after amendments)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0699/10 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 29 February 2012

Appellant: (Applicant)
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Decision under appeal:
Decision of the Examining Division of the European Patent Office posted 13 January 2010 refusing European patent application No. 07734711.0 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: G. Pricolo
Members: Y. Lemblé
S. Hoffmann

Summary of Facts and Submissions

I. European patent application No. 07 734 711.0 was refused by a decision of the Examining Division posted 13 January 2010.

II. The reason given in the decision was that amended claim 1 did not meet the requirements of Article 84 EPC because it was not clear.

In an earlier communication to the Applicant, the Examining Division was of the opinion that the present application did not contain patentable subject-matter in view of the prior art disclosed in the following documents:

D1: DE-A-102 45 975,
D3: DE-C-196 26 540,
D4: EP-A-1 142 746,
D5: DE-A-10 2005 053 057,
D6: DE-A-196 49 166,
D7: WO-A-02/062647.

III. On 15 March 2010 the Appellant (Applicant) lodged an appeal against this decision and paid the prescribed appeal fee. The statement setting out the grounds of appeal was filed with the notice of appeal.

IV. Following a communication of the Board dated 18 October 2011, the Appellant requested with letter of 17 November 2011 that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:

Claims:

- 1-4, 5 (first part) as filed with letter dated 17 November 2011,
- 5 (second part), 6-13 as filed with letter dated 1 June 2009;

Description:

- page 1-2 as annexed to the International Preliminary Examination Report,
- pages 3-8 as published (WO 2007/138458);

Figures:

- 1/2-2/2 as published (WO 2007/138458).

V. Independent claim 1 according to this request reads as follows:

"A steering system (4) for a car (1) having two front direction wheels (2) and a number of electronic dynamic-performance control devices (26) including an ESP device for controlling stability of the car; the steering system (4) comprising:
a steering wheel (6) for controlling a turn angle of the front direction wheels (2); and
a power-assist device (9), which generates a power-assist torque which is added to the torque exerted on the steering wheel (6) to vary the turn angle of the front direction wheels (2);
wherein the power-assist device (9) comprises a control unit (25), which determines operation of the electronic dynamic-performance control devices (26), and modifies the power-assist torque as a function of operation of the electronic dynamic-performance control devices (26);

the steering system (4) being characterized in comprising
a control mode for non-professional drivers whose main concern is safety as opposed to pushing the car to its extreme limit, in which, when the ESP device indicates the car (1) is close to its road-holding limit, the control unit (25) increases the power-assist torque to alert the driver accordingly in advance by increasing natural "slackening" of steering wheel (6) in advance; and
a control mode for professional drivers whose main concern is pushing the car to its extreme limit, as opposed to safety, in which, when the ESP device indicates the car (1) is close to its road-holding limit, the control unit (25) reduces the power-assist torque to counteract natural "slackening" of the steering wheel (6)."

Claims 2 to 13 define features additional to those specified in claim 1.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of the amendments under Article 123(2) EPC

There are no formal objections under Article 123(2) EPC to the amendments made to the claims and the description.

Claim 1 as originally filed forms the preamble of present claim 1. Additionally the preamble of the claim mentions that an ESP device is included among the electronic dynamic-performance control devices, a feature which is issued from claim 2 as originally filed. The features of the characterising part of claim 1 are based on the last paragraph of page 6 of the application WO-A-2007/138458 as originally filed. This paragraph discloses that, when the ESP device indicates that the car is close to its road holding limit, the control unit 25 is able to govern the power-assist torque according to two control modes. In a control mode for non-professional drivers the control unit 25 increases the power-assist torque and in a control mode for professional drivers the control unit 25 reduces the power-assist torque.

Dependent claims 2 to 13 correspond to original dependent claims 2, 3, 6 to 15 respectively.

The description has been amended to cite document D1 as the nearest prior art.

3. Clarity

As concerns the question of clarity, the examining division held that claim 1 was unclear, since it did not indicate how the control unit could detect which type of driver - professional or non-professional - was driving the vehicle. The claim defined two incompatible control modes which could not be applied at the same time. Therefore the claim should mention how the control unit could "know" which type of driver - professional or non-professional - was driving the

vehicle. Not only the claim but the whole application was defective in that it did not contain the essential information for the skilled person as to how the control unit could detect which type of driver - professional or non-professional - was driving the vehicle. In the absence of this information the claimed steering system was unable to "choose" the most adapted of the two opposite control modes in which it had to operate.

In the particular circumstances of this case, the Board considers that the absence of this information does not render the claim unclear. When claim 1 recites in its characterising part that the steering system comprises "a control mode for non-professional drivers … in which … the control unit increases the power-assist torque and a control mode for professional drivers … in which … the control unit decreases the power-assist torque" this merely implies that the steering system should be able to operate in a professional driver control mode as defined in the claim and in a non-professional driver control mode as defined in the claim. There is no necessity for the understanding of the claim and for the definition of the invention to indicate in the claim how the selection of the adequate control mode is made.

Further, the fact that the application documents as originally filed do not indicate how the adequate control mode is selected does not render the application unclear. It is well known to persons skilled in the art that modern performance cars are equipped with selecting devices enabling the driver to select a desired driving mode which influences the

dynamic performance of the car. The Applicant has cited, as an example only, a prior art document WO-A-2004/087484 (published in 2004 well before the priority date of the present application) in which it is mentioned in the passage entitled "Background art" that the passenger compartment of high-performance sport cars is normally equipped with a selection button for transmitting the selected driving mode - normal or sport - to a central control unit. In selecting the desired driving mode the current driver establishes whether the control unit operates in one control mode or in the other. The skilled person has therefore no difficulty in understanding the claim and the invention.

4. Novelty

The features of the preamble of claim 1 are known from the prior art document D1 which is acknowledged in the introductory part of the description. There is no detailed indication in document D1 as to the control strategies for modifying the power-assist torque as a function of the operation of the electronic dynamic-performance control devices.

None of the documents cited in the search report discloses a steering system that is able to operate in a professional driver control mode or in a non-professional driver control mode as defined in claim 1.

Accordingly, the steering system of independent claim 1 is novel with respect to the cited prior art.

5. Inventive step

5.1 The features of the characterising part of claim 1 define two alternate control modes for controlling the power-assist torque of the steering wheel, when the car is close to its road holding limit, one for professional drivers to allow them to push the car to its extreme limits and one for non-professional drivers to allow them to drive the car safely.

5.2 The technical problem solved by these features was therefore to propose a control mode which is adapted to the driving style of the driver.

5.3 The document D6, which was cited by the Examining Division in the International Preliminary Report on Patentability, discloses a steering system having an electric actuator for providing a power-assist torque to the steering mechanism. A road surface reaction and a road frictional coefficient is computed during a normal steering action by using functions which are normally provided in the electric power steering system. By knowing the current road surface condition, an optimum power-assist torque is produced to match each particular road surface condition and to help the driver to optimally steer the vehicle under all conditions. Control means for controlling an output of the electric actuator are adapted to reduce the power-assist torque of the steering when said computed road frictional coefficient is lower than a standard reference value. By increasing the steering torque required for turning the steering-wheel the vehicle is prevented from being excessively steered without any deliberate intention by the driver.

Although this control mode presents some similarities with the mode for a professional driver, the reduction of the power-assist torque is not triggered by the ESP device indicating that the car is close to its road holding limit but is based on the computed road friction coefficient. This steering system proposes a single control mode with continuous adaptation of the steering assist action to the particular road surface condition. This document neither discloses nor does it suggest to differentiate the control mode as a function of the skills of the driver.

5.4 The Examining Division also cited document D7 (see especially page 10, first paragraph of this document) as an example of a prior art steering system implementing a control mode which is similar to the mode for non-professional driver as claimed in claim 1. D7 indeed proposes that, when understeer limit is reached and additional steering-wheel angle fails to increase the vehicle yaw rate, the power-assist torque in the steering column is increased in order to provide the driver with a haptic indication via the steering-wheel that steer authority is about to be lost. This allows the driver to react appropriately in good time before terminal steering instability is reached.

The control strategy proposed in the document D7 remains however as it is, namely a single control mode. It cannot be modified as a function of the skills of the driver and there is no suggestion in D7 to do so.

5.5 The ability of the claimed steering system to govern the power-assist torque according to two control modes,

one control mode for non-professional drivers in which the control unit increases the power-assist torque and a control mode for professional drivers in which the control unit reduces the power-assist torque, when the ESP device indicates that the car is close to its road holding limit, is not suggested by any of the other documents cited in the international search report.

5.6 The Board concludes that the subject-matter of claim 1 involves an inventive step.

5.7 Dependent claims 2 to 13 relate to further developments of the inventive concept disclosed in claim 1 and by virtue of their dependency contain all of the features of claim 1. The above conclusions regarding novelty and inventive step apply equally to these claims which likewise meet the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the basis of the documents indicated in point IV above.

The Registrar The Chairman

A. Vottner G. Pricolo