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Datasheet for the decision of 5 June 2007

Case Number: T 1181/05 - 3.2.01

Application Number: 99303229.1

Publication Number: 0952046

IPC: B60R 21/32

Language of the proceedings: EN

Title of invention:
Pedestrian impact sensor system

Patentee:
JAGUAR CARS LIMITED

Opponent:
Siemens AG

Headword:
-

Relevant legal provisions:
EPC Art. 54

Keyword:
"Novelty - yes"

Decisions cited:
-

Catchword:
-

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Case Number: T 1181/05 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 5 June 2007

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 27 June 2005 rejecting the opposition filed against European patent No. 0952046 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
T. Karamanli

Summary of Facts and Submissions

I. The appeal is directed against the decision posted 27 June 2005 to reject the opposition against European patent No. 0 952 046.

II. The following state of the art documents have been cited:

D1: WO-A-97/18108
D2: US-A-5 684 701
D3: DE-A-28 21 156
D4: DE-A-44 07 763
D5: EP-A-0 758 741
D6: DE-C-42 37 072
D7: US-A-5 010 774
D8: U. Tietze *et al.* "Halbleiter-Schaltungstechnik", Springer-Verlag, 1985, 756, 757, 760-63.

III. The patent as granted contains two independent claims which read as follows:

"1. A pedestrian impact sensing system for a motor vehicle, the system comprising sensing means (4) for measuring the loads acting simultaneously on different regions across the front of the vehicle to produce a pressure pattern (12), means (14, 17) for monitoring changes in measured pressure patterns over time, means (14, 17) for comparing the changing pressure patterns (12) with stored data for changing pressure patterns characteristic of pedestrian collisions, and means (14, 17) for sending a triggering signal for activating a cushioning device (16) when a correspondence is

identified between a measured changing pressure pattern and stored data.

10. A method for detecting pedestrian impact with a motor vehicle, comprising:
measuring loads acting simultaneously across the front of the vehicle to produce a pressure pattern (12);
monitoring changes in measured pressure patterns over time;
comparing the changing pressure patterns with stored data for changing pressure patterns characteristic of pedestrian collisions to determine if there is a correspondence;
sending a triggering signal to activate a cushioning device (16) if a correspondence is identified."

Claims 2 to 9 and 11 define features additional to those in claim 1.

IV. The appellant requested that the contested decision be set aside and the patent revoked. The respondent requested that the appeal be rejected. Neither party filed a request for oral proceedings.

V. The appellant argued essentially as follows:

The claimed subject-matter is said to improve on the disclosure of D1 in as far as it may dispense with the need for a sensor on the vehicle bonnet. The claimed feature of a pressure pattern is created by a series of sensors whose output signals in practice will be digitally encoded and recorded at each instant of time. The skilled person faced with the disclosure of the patent will appreciate that the digital signals may be

created using A/D converters such as are known from D8. In order to assign appropriate values to those signals they must be compared with a stored value at each time interval.

D1 discloses a pedestrian impact protection system in which a first sensor is mounted on the bumper. A second sensor is on the leading edge of the bonnet and therefore also is on the front of the vehicle. The first and second sensors both extend across the front of the vehicle but may be replaced by groups of sensors. The vertical spacing and horizontal grouping of the first and second sensors results in a matrix. In figure 3 of D1 typical outputs of the sensors during a pedestrian impact are shown. In order to recognize that the impact is with a pedestrian it is necessary to monitor the output of all sensors at each point in time. It is also disclosed in D1 that the control unit compares various characteristics of the output of all sensors with predetermined criteria and triggers the inflation of an airbag when these are fulfilled. This disclosure contains all features of the subject-matter of present claim 1 which therefore lacks novelty.

The opposition division was incorrect in finding that determination of a pressure pattern and comparing its change with time against stored data as presently claimed is different from determining the magnitudes of and time delays between sensor signals and comparing these with stored data, as disclosed in D1. The opposition division overlooked both that according to D1 the sensor on the bonnet edge also is monitored and that D1 does not disclose measuring the time delay between the signals from the first and second sensors

but merely that the delay must be typical of that resulting from a pedestrian impact.

VI. The respondent's reply may be summarised as follows:

D1 does not disclose continuous monitoring of both first and second sensors signals. It determines whether a pedestrian impact has occurred on the basis of the output of only the sensor on the bumper. Moreover, D1 does not disclose the use of a digital processor. The appellant also is incorrect when it states that D1 does not disclose measuring the time delay between the signals from the first and second sensors; this is an essential aspect of the teaching of D1.

Reasons for the Decision

1. Some systems to reduce injuries to pedestrians which are impacted by the front of a moving vehicle employ a device to act as a cushion between the pedestrian's head and the bonnet of the vehicle. Sensors register the impact of the front of the vehicle with the pedestrian and their output is used to trigger the device. Means are required to prevent triggering when an impact is not with a pedestrian and it is the identification of an impact as being with a pedestrian to which the present patent relates.

2. D1 discloses a pedestrian impact sensor system which comprises a first impact sensor extending across the front bumper, a second extending across the leading edge of the bonnet and a control unit. The control unit receives the signals from the sensors and a further

signal indicative of vehicle speed and contains stored information relating to vehicle speed-related impact thresholds. When an object is impacted and signals are received from both the first and second sensors the control unit compares various features of the received sensor signals, for example their magnitudes and the time interval between them in relation to the speed of the vehicle. When these meet specified criteria a trigger signal is produced to activate a protection device. Each sensor may be an optical fibre sensor and may be replaced by groups of sensors but no further details are given as regards the arrangement of the groups of sensors or how their signals might be processed.

Novelty with respect to D1

3. Present claim 1 specifies "sensing means for measuring the loads acting simultaneously on different regions across the front of the vehicle to produce a pressure pattern" and "means for monitoring changes in measured pressure patterns over time". According to the patent specification it is the distribution of load, as represented in the pressure pattern, which principally characterises a pedestrian impact.

3.1 The pressure pattern represents loads acting simultaneously on different regions across the front of the vehicle and so clearly implies the ability to differentiate the loads measured at various lateral positions. The only type of sensor proposed by D1, an optical fibre sensor, if extending across the width of the bumper or bonnet would be capable of registering impacts at any point throughout its length but would be

unable to distinguish between two or more laterally spaced but simultaneous impacts. D1 does suggest that the single sensors alternatively could be "replaced by groups of sensors", which may be regarded as disclosing multiple laterally spaced sensors. However, even if that were the case it still is not disclosed that their signals would be transmitted discretely to the control unit and that this would be able to create a pressure pattern based on those signals. Indeed, according to the teaching of D1 irrespective of the arrangement of the sensors the control unit merely uses the signal(s) from the first sensor(s) to determine a degree and instant of impact. It therefore cannot be regarded as directly and unambiguously disclosed in D1 that the system would provide a pressure pattern within the meaning of present claim 1. For this reason it is not necessary to consider the appellant's arguments with reference to D8 relating to the operation of the sensors. Since the first and second sensors in combination may provide information on impacts at different heights they still would be unable to differentiate between laterally spaced impacts. The matter of simultaneous monitoring of the first and second sensors in D1 therefore is not decisive as regards novelty of the subject-matter of present claim 1.

3.2 Since D1 does not disclose the concept of a pressure pattern within the meaning of present claim 1 it also does not disclose the associated features of means for monitoring changes in measured pressure patterns over time and means for comparing the changing pressure patterns with stored data for changing pressure patterns characteristic of pedestrian collisions.

3.3 The board concludes from the foregoing that the subject-matter of claim 1 is new (Article 54 EPC). Since the subject-matter of method claim 10 contains corresponding steps relating to a pressure pattern and dependent claims 2 to 9 and 11 contain all features of claim 1 this conclusion applies equally to all other claims.

Inventive step

4. Although the opposition division in its decision considered the matter of inventive step of the subject-matter of claim 1 the appellant has not challenged this aspect of the decision. The board has considered the matter in accordance with Article 114(1) EPC and is satisfied that none of the available state of the art would encourage the skilled person to determine impact with a pedestrian by establishing a pressure pattern within the meaning of present claim 1, monitoring changes in it with time and comparing them with stored data characteristic of an impact with a pedestrian. It follows that the subject-matter of claims 1 and 10 and therefore also of claims 2 to 9 and 11 involves an inventive step (Article 56 EPC).

5. Since none of the grounds for opposition pursued by the appellant prejudices maintenance of the patent as granted the appeal is unsuccessful.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner S. Crane