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**Datasheet for the decision  
of 20 April 2015**

**Case Number:** T 1502/12 - 3.2.01

**Application Number:** 05735044.9

**Publication Number:** 1868846

**IPC:** B60R1/02

**Language of the proceedings:** EN

**Title of invention:**

DEVICE FOR ORIENTING THE EXTERNAL REAR-VIEW MIRRORS OF A  
VEHICLE TO AVOID THE MOMENT OF DEAD ANGLE.

**Patent Proprietor:**

Serra, Alessandro

**Opponent:**

AUDI AG

**Headword:**

**Relevant legal provisions:**

EPC 1973 Art. 56

**Keyword:**

Inventive step - (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Chambres de recours**

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Case Number: T 1502/12 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 20 April 2015**

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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
10 May 2012 concerning maintenance of the  
European Patent No. 1868846 in amended form.

**Composition of the Board:**

**Chairman** Y. Lemblé  
**Members:** W. Marx  
O. Loizou

## Summary of Facts and Submissions

- I. The appeal of the opponent is directed against the decision of the opposition division posted 10 May 2012 to maintain the European patent No. 1 868 846 in amended form on the basis of a new main request filed during the oral proceedings.
- II. In its decision the opposition division held that the amendments made to claim 1 did not constitute an extension of subject-matter, that the invention was sufficiently disclosed and that claim 1 involved an inventive step in view of, *inter alia*, the following documents:
- E2: US 6193 380;  
E6: DE 195 07 957;  
E16: DE 101 25 426.
- III. In response to the board's communication under Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA, OJ EPO 2007, 536), a new claim 1 was filed by the patent proprietor with letter dated 12 March 2015.
- IV. Oral proceedings before the board took place on 20 April 2015.

The appellant (opponent) requested the decision under appeal to be set aside and the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed and withdrew amended claim 1 as filed with its letter dated 12 March 2015.

V. Claim 1 according to the sole request (broken into a feature analysis according to the contested decision) reads as follows:

- a' Device for motor vehicles characterised in that
- d' it comprises an electronic unit with radio tachometer
- e' which puts into operation, when the speed of a vehicle approaching from behind in relation to that of a slower vehicle is such that said latter vehicle will presumably be overtaken on the left or the right,
- f' one or other of two acoustic warning means mounted respectively on the left and on the right inside the slower vehicle and,
- b' by means of certain special devices, rotates one or other of the external rear-view mirrors mounted respectively on the right and left
- c' in such a way that the eyes of the driver in the slower vehicle can continue to see the overtaking vehicle, thus avoiding the dead angle that is created by the rear-view mirrors at present in use.

VI. The appellant's arguments, as far as they are relevant to this decision, may be summarised as follows:

The closest prior art document E2 showed features a', b' and c'. Assuming that the term "radio tachometer" in feature d' meant a radar sensor, which obviously was adapted to measure the speed of an overtaking vehicle, such feature was also known from E2 (see column 5, lines 30 to 31). Moreover, E2 disclosed feature f' in part (see column 5, lines 50 to 54: "a conventional

sound producing device 61 ... to audibly alert the driver").

Since neither the two missing features (e'; f' in part) nor the effects provided by them (feature e' provided a more appropriate trigger criterion than just checking the presence of a vehicle, verifying an actual situation of overtaking; feature f' provided in addition a directional information when warning the driver) exhibited a synergistic effect, they related to different objective problems, namely:

- (a) to provide an improved trigger criterion for determining if a situation of overtaking was actually present (excluding e.g. parked vehicles),
- (b) to provide improved directional driver information.

As regards problem (a), the skilled person would consider document E16 showing a warning system and a method for monitoring a dead angle. E16 addressed problem (a) (paragraph [0004]: drawback of known systems which just detected the presence of a vehicle in the dead angle area) and also related to a situation of overtaking (paragraphs [0007] to [0009]). To achieve its object, a radar sensor together with an electronic unit was used (see paragraph [0027]) to determine the moving direction of vehicles (which required a comparison of speeds) and their relative velocity (paragraph [0028]: change of distance in time), and E16 also mentioned an acoustic warning (paragraph [0062]). Feature e', as worded in claim 1, did not relate to a control of mirrors but to the activation of acoustic warning means, as explicitly mentioned in E16.

The solution to problem (b) proposed in claim 1, taking into account the knowledge of the person skilled in the

art, was already obvious in view of E2, which showed a side-selective rotation of the rear-view mirrors. Moreover, it was known in the prior art of dead angle warning systems to issue a side-selective warning, in particular e.g. a side-selective acoustic warning (E6, column 4, lines 41 to 51). E6 also mentioned explicitly a dead angle warning device (column 7, lines 6 to 9).

As a consequence, distinguishing feature e' and the directional selectivity in feature f' could not justify an inventive step. Since claim 1 did not specify any distance of a vehicle approaching from behind, the wording of present claim 1 encompassed a device which only detected an approaching vehicle within the blind spot area.

VII. The respondent's counter-arguments can be summarised as follows:

The invention consisted in combining the two features of

- detecting the difference in speeds of two vehicles, the faster vehicle approaching from behind a slower vehicle, and of
- using the above information to suitably rotate the rear-view mirrors and to activate acoustic warning means.

The invention addressed the problem of "controlling the movement of the rear-view mirrors in order to avoid the dead angle of said mirrors".

E2 detected only the presence in the blind spot area, not the speed, of a vehicle approaching from behind and, in response, turned angularly adjustable side view mirrors. In order to improve the detection of a vehicle in the blind spot area of E2, the skilled person would

consider document E16. However, E16 addressed a different problem, namely avoiding false alarms when detecting the presence of vehicles in the blind spot area rather than detecting the said presence more quickly.

The teaching of E16 started from the consideration that the mirrors of E2 detected the presence in the blind spot area also of vehicles coming from a contrary direction or of stationary vehicles (paragraphs [0004], [0005]). The mirrors of the vehicle according to E16 were not angularly adjustable, and E16 referred only to the emission of warning signals depending on the detected presence of a vehicle in the dead angle of a rear-view mirror (paragraphs [0007], [0008]). According to E16, the direction of movement of an object was ascertained in order to decide whether to produce a warning signal (paragraph [0010]). As explained in E16 with reference to Figure 1, a rear radar sensor emitted a signal on the basis of which the distance of a vehicle approaching from behind was verified. On the basis of the variation of said distance, the direction of movement of the rear vehicle was determined (paragraphs [0027], [0028]). The presence of a vehicle in the rear area raised a warning signal for the driver only when the rear vehicle was moving substantially in the same direction (paragraph [0030]). As mentioned in relation to Figure 3 (paragraph [0039]; see also paragraph [0044] with regard to Figure 4), the warning system was connected to a tachometer which detected the speed of the own vehicle, but the detection range was only in the range of 5 to 7 meters even at high speeds, which was far from the invention. According to paragraph [0046], blocking of the warning signals could be removed after a time interval depending on the speed of the own vehicle or the speed of the vehicle coming

from the opposite direction. Summarising the teaching of E16, the direction of movement of an obstacle in the blind spot area of a vehicle had to be determined in order to avoid the emission of false alarms, and said direction was to be obtained (see paragraph [0049]), after a time interval  $t_1$ , through verification of the speed (speed of the own vehicle or the obstacle, or the relative speed) during a prefixed interval. There was no suggestion in E16 that said interval could be omitted and that a warning signal was emitted when just the presence of an obstacle in the blind spot area was detected.

The skilled person could have decided to use the information of the approaching speed of an obstacle to activate mirror rotation, but there was no prompting in the prior art. Since the mirrors in E16 were not able to rotate, it was of maximum importance to inform the driver only of really dangerous situations and to avoid false alarms. The problem of the invention was to inform the driver of a vehicle as early as possible of a presumably overtaking vehicle, and since the driver could see the overtaking vehicle during the complete overtaking step, he was able to decide if the alarm was false. Detection of the speeds did not necessarily imply the presence of the faster vehicle in the rear-view mirror of the slower vehicle.

In conclusion, there was no basis in the prior art for arriving at step e', since there was no teaching or any hint to rotate the rear-view mirrors dependent on actual relative speed.

Also feature f' was new and non-obvious. Two acoustic warning means were not known from E2, and E16 did not show acoustic warning means activated depending on the



side where overtaking took place and depending on actual relative speed. The claimed selective activation of the acoustic means on either side of the vehicle was linked to the difference in speed of the two vehicles in an overtaking situation. In all cited references, the detector only gave information related to the presence of a vehicle in the area under its control.

The idea of the invention was to inform the driver as early as possible about the presence of a faster vehicle approaching from behind, i.e. well in advance of the entry of the following vehicle in the blind spot area or in the proximity of the vehicle to be overtaken, and to avoid the birth of a dead angle by starting to rotate the mirrors before the approaching vehicle was in the blind spot area ("presumably overtaken"). So the driver could see what was going to appear in the mirror, even if the approaching vehicle was still far away.

## **Reasons for the Decision**

1. *Inventive step (Article 56 EPC 1973)*
  - 1.1 The subject-matter of claim 1 according to the respondent's sole request does not involve an inventive step in the sense of Article 56 EPC 1973.
  - 1.2 It was undisputed that document E2 represents the closest prior art and shows a device for motor vehicles which rotates one or other of the external rear-view mirrors so that an overtaking vehicle remains visible to the driver, thus avoiding the dead angle, as specified by features a', b' and c'. Irrespective of the exact limitation provided by the term "radio

tachometer" in feature d', the board is convinced that a microwave or radar signal as known from E2 (see column 5, lines 31 to 32) refers to a detector (or "meter") based on "radio" waves. Hence, feature d' is also partly known from E2. Apart from controlling the rear-view mirrors to rotate when a following vehicle enters the blind spot area, an additional acoustic driver warning might be provided in E2 (see column 5, lines 50 to 53), so part of feature f' relating to "acoustic warning means" is already disclosed in E2. Since E2 only detects the presence of a vehicle in the blind spot area, feature e' is not known from E2.

- 1.3 The trigger criterion for operating the acoustic warning means and the rear-view mirrors as specified by distinguishing feature e' ("which puts into operation, when the speed of a vehicle approaching from behind in relation to that of a slower vehicle is such that said latter vehicle will presumably be overtaken on the left or the right"), which takes into account the speed of the vehicle approaching from behind in relation to the own vehicle's speed, verifies that a vehicle arriving in the blind spot area is an overtaking vehicle, i.e. improves the detection of overtaking vehicles.

The part of feature f' not known from E2 relates to the mounting of two acoustic warning means on the left and right inside the vehicle and - as derivable when reading in conjunction with feature e' - operating "one or other of the two acoustic warning means". Although feature f' leaves open whether the one or other acoustic warning means is operated according to the side where overtaking takes place, acoustic warning is produced side-selectively on either side of the vehicle according to feature f'.

In the board's view, the distinguishing features over document E2 are not functionally interdependent, since the speed condition for initiating control, as specified by features d' (partly) and e', is not influenced by the side-selective acoustic driver warning as produced by feature f'. When detecting a faster vehicle approaching from behind, the detection of overtaking vehicles can be improved in comparison to the mere detection of a vehicle present in the blind spot area, whereas a side-selective acoustic driver warning improves driver attention in an imminent situation of being overtaken. Based on these technical effects, taking into account that the problem to be formulated should not contain any hint to the solution, the following partial problems can be derived:

- a) how to improve the detection of an overtaking vehicle,
- b) how to better attract the driver's attention in an imminent situation of being overtaken.

The problem formulated by the respondent ("to control the movement of the rear-view mirrors in order to avoid the dead angle of said mirrors") is already solved in E2, so it cannot represent the objective technical problem when applying the problem-solution approach.

- 1.4 As agreed by the respondent, the skilled person would consider document E16 when trying to improve the detection of a vehicle in the blind spot, i.e. the detection of a typical situation of an overtaking vehicle. E16 explicitly addresses (paragraphs [0004] to [0009]) the problem linked to the detection of the mere presence of a vehicle in the blind spot or dead angle area, in particular in difficult traffic situations, with the aim of excluding situations causing a false alarm, e.g. stationary vehicles or vehicles running in the opposite direction. In order to solve this problem,

which is similar to above-mentioned partial problem a), E16 proposes (see paragraphs [0027] and [0028]) detecting a change in distance between the own vehicle and a vehicle behind. The change in distance between two vehicles represents the relative speed between the two vehicles. Moreover, in E16 a direction of movement of the vehicle in the rear area relative to the own vehicle is determined, and a driver warning is generated only when the rear vehicle is moving in the same direction as the own vehicle, indicating e.g. an overtaking manoeuvre (as described in paragraphs [0028] to [0030]). Accordingly, in the board's judgement, E16 teaches to improve the detection of an overtaking vehicle by determining relative speed and judging the relative movement direction of the vehicle in the rear area relative to the own vehicle, in particular a relative movement direction of the rear vehicle corresponding to the movement direction of the own vehicle - which indicates that a vehicle is approaching from behind at a faster speed than the speed of the own vehicle, as specified by feature e' - before putting a warning device into operation. Therefore, by consulting the teaching of E16, the skilled person would arrive in an obvious manner at the solution proposed by feature e'. Moreover, it is obvious for the skilled person that the "radar" mentioned in E2 would also be suitable for measuring speed, as implied by the term "tachometer" in feature d'. As explicitly confirmed by E16 (see paragraphs [0027] and [0028] and Figure 1), a radar sensor is used to determine the change in distance between a first vehicle and a second vehicle approaching from behind, i.e. to determine a relative speed between the two vehicles.

As regards the respondent's arguments, the respondent's formulation of the problem solved by E16 - avoiding

false alarms for vehicles arriving in the blind spot area - is included in partial problem a) as formulated above, since E16 explicitly wants to exclude non-overtaking vehicles and therefore also wants to improve the detection of overtaking vehicles (see paragraphs [0004] to [0008]). Moreover, since claim 1 according to the sole request does not refer to any distance between the two vehicles in an overtaking situation, or to any point in time when to put into operation the acoustic warning and the rotation of the rear-view mirrors, the board finds that any time-related aspect has to be excluded when defining the objective problem to be solved. Taking into consideration relative speed as specified by feature e' might allow for faster or earlier warning of an upcoming overtaking manoeuvre, i.e. well in advance of the entry of the following vehicle into the blind spot area. However, the subject-matter as defined by claim 1 is not limited in this respect, but comprises a device which detects a vehicle approaching from behind only shortly before or even after having entered the blind spot area, as indicated in E16 by the mention of a limited sensor detection range of only 5 to 7 meters (see paragraph [0039]). E16 does not show rear-view mirrors which are angularly adjustable, but such a feature is already known from E2 and does not play any role when trying to solve partial problem a), i.e. when assessing the criterion for deciding whether a rear vehicle has started an overtaking manoeuvre. As to the aim of the invention to allegedly rotate the rear-view mirrors before the approaching vehicle enters the blind spot area, claim 1 does not contain any feature which would provide such a distinction over the prior art. Such a distinction would also imply having defined in the specification the optical characteristics of the rear-view mirrors, which is not the case.

The time interval mentioned in E16 in paragraph [0049] relates to an embodiment where, in addition to rearward- looking sensors, front-looking sensors are provided in order to detect oncoming vehicles moving and passing by in a direction opposite to the own movement direction. In this embodiment, the time interval defines - based on the relative speed between the own vehicle and the oncoming vehicle - a waiting time until the oncoming vehicle has reached the rear detection range and the rearward-looking sensors start to detect vehicles in the area behind the own vehicle. However, even in this embodiment in E16 (see paragraphs [0049], [0050]), if it is decided on the basis of the rearward-looking sensors that a vehicle is approaching from behind, a driver warning is issued irrespective of the detection result of the front-looking sensors. Therefore, this embodiment in E16 also leads in an obvious manner to feature e' when starting from closest prior-art document E2, which only shows rearward-looking sensors, because the presence of additional front-looking sensors is irrelevant when a vehicle approaching from behind is detected by the rearward-looking sensors. Moreover, the embodiment as discussed above and described in E16 in relation to Figure 1 in paragraphs [0027] to [0030] refers to a method for detecting an overtaking vehicle which only relies on the signals of a radar sensor monitoring the area behind the own vehicle. Therefore, the board cannot share the respondent's view that there is no suggestion in E16 that the time interval mentioned in E16 in relation to a different embodiment could be omitted. A similar reasoning applies with respect to a further embodiment described in E16 in paragraph [0046] and the blocking of warning signals disclosed for this embodiment.

1.5 The obvious combination of documents E2 and E16 does not yet provide further details with regard to the acoustic warning means. The skilled person, trying to solve partial problem b) to improve the driver's attention in an imminent overtaking manoeuvre, would have found document E6, which explicitly mentions a system detecting vehicles approaching from behind, in particular in the blind spot area, i.e. a typical situation of being overtaken, and indicating such vehicles to the driver (column 7, lines 4 to 9, relating to the embodiment according to Figure 4 which shows two vehicles on the left and right side behind the own vehicle). In the context of the embodiment according to Figure 4, the indication means are not further described. However, a previous embodiment explicitly refers to an acoustic warning means as sole indication means which comprises two loudspeakers mounted respectively on the left or on the right inside of the vehicle, and which are operated to provide a side-selective acoustic warning (see column 4, lines 41 to 51) by operating one or other of the two loudspeakers in order to warn the driver that the vehicle is moving out of its lane on the left or right side. In view of this teaching of E6, it cannot be considered inventive to indicate overtaking vehicles to the driver by operating "one or other of the two acoustic warning means mounted respectively on the left and on the right inside the slower vehicle" as specified by feature f'. Even if not explicitly said in E6 in relation to the embodiment according to Figure 4, it is obvious for the skilled person to use the two loudspeakers previously described as sole warning means, in particular because E2 already proposes acoustic warning means to warn the driver when a vehicle enters the blind spot area. Moreover, since in

E6 (Figure 4) the rear area on both sides of the own vehicle is monitored and E6 already teaches (column 4, lines 41 to 51), albeit in the context of a different embodiment, the use of two loudspeakers to provide a side-selective warning, it is considered obvious to operate only one of the two loudspeakers also in order to indicate on which side a vehicle approaching from behind is detected. Therefore, the skilled person facing partial problem b) would arrive at the acoustic warning means as specified by feature f' without the exercise of an inventive step.

According to the respondent, the selective activation of the acoustic means on either side of the vehicle was allegedly linked to the difference in speed of the two vehicles. However, as argued above, the difference in speed is the trigger condition for starting the control features (rotation of the rear-view mirrors, operation of the acoustic warning means) in an imminent situation of being overtaken, and such a trigger condition is already obvious in view of the combination of documents E2 and E16.

- 1.6 The board therefore concludes that the subject-matter of present claim 1 according to the sole request is obvious in view of the combination of documents E2, E16 and E6 and so does not involve an inventive step as required by Article 56 EPC 1973.
2. Consequently, the sole request of the respondent is not allowable and the patent in suit must be revoked.



**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



C. Rodríguez Rodríguez

Y. Lemblé

Decision electronically authenticated