BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 923/90 - 3.2.1

Application No.: 84 114 817.4

Publication No.: 0 148 420

Title of invention: Vehicle windscreen wiper with a single wiper blade

Classification: B60S 1/34

D E C I S I O N
of 11 June 1992

Proprietor of the patent: FIAT Auto S.p.A.

Opponent:
01) Robert Bosch GmbH
02) SWF Auto-Electric GmbH
03) Daimler- Benz AG

Headword:

EPC Article 56

Keyword: "Inventive step (yes)"

Headnote

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 923/90 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 11 June 1992

Appellant : (Proprietor of the patent)
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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 17 May 1990, and posted on 11 October 1990, revoking European patent No. 0 148 420 pursuant to Article 102(1) EPC.

Composition of the Board :

Chairman : F. Gumbel
Members : S. Crane
W.M. Schar

Summary of Facts and Submissions

I. European patent No. 0 148 420 was granted on 9 December 1987 on the basis of European patent application No. 84 114 817.4.

II. The patent was opposed by the Respondents (Opponents 01 to 03) on the grounds that its subject-matter lacked novelty and/or inventive step with respect to the state of the art.

The following state of the art documents were cited:

(D1) DE-C-1 066 890
(D2) DE-C-3 125 628
(D3) FR-A-1 561 395
(D4) FR-A-2 178 683
(D5) FR-A-2 194 173
(D6) US-A-3 831 220
(D7) US-A-1 660 971
(D8) JP-U-4 633 947
(D9) DE-A-2 215 307.

III. By its decision taken at oral proceedings on 17 May 1990 and issued in written form on 11 October 1990, the Opposition Division revoked the patent.

The reason given for the decision was that the subject-matter of Claim 1 as submitted at the oral proceedings could be derived in an obvious manner from a combination of the teachings of documents D4 and D8.

IV. The Appellants (Proprietors of the patent) filed an appeal against this decision on 30 November 1990, the appeal fee being paid on the same day.

The Statement of Grounds of Appeal was filed on 8 February 1991.

In this Statement the Appellants requested that the contested decision be set aside and the patent maintained on the basis of claims substantially corresponding to those submitted at the oral proceedings before the Opposition Division (main request), or in the alternative on the basis of new claims submitted with the Statement of Grounds of Appeal (subsidiary request). They also requested oral proceedings in the event that the patent could not be maintained according to the subsidiary request.

V. In a communication of the Board pursuant to Article 110(2) EPC dated 4 October 1991 the provisional opinion was expressed that Claim 1 according to the main request of the Appellant was unclear and that its subject-matter was not adequately distinguished from the state of the art. These deficiencies were however not exhibited by Claim 1 according to the subsidiary request. On the other hand this latter claim did not conform to the requirements of Rule 29(1) EPC concerning the division of its features between preamble and characterising clause.

On the question of the inventive step of Claim 1 according to the subsidiary request of the Appellants it was pointed out that in the particular construction claimed use of an internally toothed ring gear was not, as argued by the Respondents, the simple mechanical equivalent of an externally toothed gear segment.

VI. In response to this communication the Appellants filed on 3 December 1991 new Claims 1 and 2 and amended pages of the introductory description on the basis of which, together with the remaining parts of the description and

the drawings of the patent specification, maintenance of the patent in amended form was requested.

Claim 1 is worded as follows:

"A vehicle windscreen wiper (1) of the type comprising a first arm (3), a wiper blade holding member (4) disposed rigidly on one end (5) of said first arm (3), a second arm (7) supporting said first arm (3) and mounted by means of a pin (6) for reciprocating rotational movement about the axis of said pin (6), and transmission means (8) for transmitting to said first arm (3) a motion which is relative to said second arm (7) so as to cause said wiper blade holding member (4) to translate in a direction substantially radial to the axis of said pin (6) simultaneously with the rotation of said second arm (7), said second arm (7) being mounted at an intermediate point (12) on said pin (6), said transmission means (8) comprising a connecting rod-crank mechanism (13) connecting the first arm (3) to the second arm (7) in a zone outside of said pin (6) and there being at least one pair of gear wheels (14, 15) for operating said connecting rod-crank mechanism (13) as the result of a rotation of said second arm (7) about the axis of said pin (6),

characterised in that

said pin (6) is a rotatable pin, said second arm (7) being keyed on to said rotatable pin (5) which is able to transmit to said second arm (7) a reciprocating rotational movement about the axis of said pin (6), said first arm (3) is the rod of said rod-crank mechanism (13), said first arm (3) assuming different inclinations with respect to said second arm (7) during the rotational movement of the said pin (6), said mechanism comprising a crank (20) connected between a first end (16) of said second arm (7) and a second end (22) of said first arm (3), distant from said wiper blade holding member (4), and comprising a

fixed ring gear (14) disposed concentrically to said rotatable pin (6) and internally toothed, a pinion (15) engaging with said ring gear (14) and mounted idly on the first end (16) of said second arm (7), said crank (20) being keyed in an angularly rigid manner on to said pinion (15) and hinged to the second end (22) of said first arm (3), distant from said wiper blade holding member (4) and there being a connection element (18) carried by the second end (17) of said second arm (7) distant from the first and engaging in a longitudinal slot (21) provided in an intermediate portion of said first arm (3) over a predetermined length."

Dependent Claim 2 relates to a preferred embodiment of the windscreen wiper of Claim 1.

VII. The Respondents have filed no observations with respect to either the communication of the Board or the new documents filed by the Appellants, these having been communicated to the Respondents with letters dated 12 December 1991.

VIII. The arguments presented by the Appellants in support of their request can be summarised as follows:

In the windscreen wiper as shown in document D4 the first arm holding the wiper blade was mounted for sliding movement in a channel on the second arm. In operation the rod-crank mechanism imposed a lateral force on the second arm which led to unnecessary friction and wear.

It had indeed been proposed in document D8 to provide a sliding pin connection between the first and second arms such that these arms could rotate with respect to each other. The drive for the windscreen wiper involved however two rotatable gear wheels and was thus bulky and expensive.

There was no incentive for the skilled man to combine the teachings of documents D4 and D8 but even if he were to do so he would not arrive at the subject-matter of Claim 1. The requirement of Claim 1 that the pinion cooperate with an internally ring gear was significantly different to the proposal of document D4 in which the pinion cooperated with an externally toothed gear segment since this ensured that in those regions when the first arm was moved radially outwardly its rotational speed was higher than that of the second arm.

IX. In support of their request that the appeal be dismissed the Respondents put forward in essence the following arguments:

It would be obvious for the skilled man faced with the problem of friction and wear in the arrangement according to document D4 to adopt the proposal of document D8 of pivoting one end of the first arm directly to the crank and having a sliding pivoting connection between the first and second arms. Nothing of inventive significance could be seen in the use of an internally toothed ring gear as required by Claim 1 instead of an externally toothed gear segment as shown in document D4, since these were simple mechanical equivalents.

Reasons for the Decision

1. The appeal meets the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC; it is therefore admissible.

2. Formal admissibility of the amended documents

Present Claim 1 comprises the features of granted Claims 1 and 2, these claims corresponding in essence to a

combination of the features of original Claims 1 and 2, and to original Claim 3 respectively.

Present Claim 2 corresponds to granted Claim 3, which in turn corresponds to original Claim 4.

The amendments to the description do not go beyond those necessary to bring this into conformity with the amended claims and to recognise the most relevant background art.

There are, therefore, no objections to the present documents under Articles 123(2) and (3) EPC.

3. State of the art

Single blade windscreen wiper arrangements with means for moving the wiper blade outwardly into the corner areas of the windscreen during sweeping movement of the wiper blade are well known in the art.

The most relevant state of the art is to be found in document D4, on which the preamble of Claim 1 is based. (Documents D6 and D9 are equivalent family members.) The windscreen wiper according to document D4 comprises a first arm which carries the wiper blade and which is mounted telescopically on one end of a second arm pivotable about a pin fixed to the chassis of the vehicle. The opposite end of the second arm is coupled to a reciprocating drive for rotating the second arm about the pin. Between the pin and this opposite end the second arm rotatably carries a pinion which is rotationally fast with a crank. The pinion engages the teeth of a toothed gear segment the centre of which coincides with the axis of the pin. The end of the crank is coupled to one end of a link member the other end of which is coupled to an end of the

first arm. In use, rotation of the second arm generates rotation of the pinion and accordingly, sliding movement of the first arm with respect to the second arm.

Documents D1 to D3 and D7 relate to windscreen wipers similar to that of document D4 insofar as the first arm, which carries the wiper blade, is mounted solely for longitudinal sliding movement with respect to the second arm and is operated on by a crank mechanism the movement of which is linked to the rotation of the second arm.

The windscreen wiper of document D5 utilises a different concept, the first arm being mounted solely for rotation on the free end of the second arm, the second arm incorporating gearing coupled to the axis of the first arm such that in use the arms counter-rotate about their respective axes.

According to document D8 a drive shaft for the windscreen wiper carries firstly a crank arm which is linked to the end of the first arm remote from the wiper blade and secondly a pinion which meshes with further pinion rotationally fast with one end of the second arm. The other end of the second arm carries a pin which slides in a channel extending along the first arm.

4. Novelty

As is apparent from the above discussion of the state of the art the subject-matter of Claim 1 is novel. It is distinguished from the closest state of the art represented by document D4 by the features specified in the characterising clause of the claim. Since novelty has not been in dispute in the appeal proceedings further elucidations on this point would be superfluous.

5. Inventive step

In comparison with the closest state of the art known from document D4 the technical problem solved by the invention is to be seen in the provision of a windscreen wiper of the single blade type which has a minimum of parts, is reliable in long-term service and which allows the corner areas of the windscreen to be wiped efficiently with a minimum distraction to the driver. In this respect it is apparent that by connecting the second end of the first arm directly to the crank and allowing pivoting and sliding movement of the first arm with respect to the second arm frictional losses and wear of the mechanism will be reduced. Furthermore, the set-up of the mechanism is such that when the first (blade-carrying) arm is being extended into the corner areas of the windscreen it will rotate about the second arm in the same sense as the rotation of the second arm about its axis with the result that these critical areas of the windscreen will be swept more quickly.

The principle of allowing sliding and pivotal movement between the first and second arms is known from the windscreen wiper arrangement according to document D8. If the skilled man were to recognise the friction loss and wear reducing potential of this arrangement with respect to the gliding arrangement shown in document D4 and modify that arrangement accordingly he would not however arrive at the windscreen wiper claimed, in which the pinion of the rod-crank mechanism engages with an internally toothed ring gear instead of an externally toothed gear segment in the prior art. The argument of the Respondents that these are simple mechanical equivalents which can be exchanged at will by the skilled man cannot be accepted in the present case since it is the use of an internally toothed ring gear that leads to the advantageous speed

enhancement of the wiper blade in the critical corner areas of the windscreen. As demonstrated by the Appellants by means of diagrams submitted with their Statement of Grounds of Appeal a notional combination of the teachings of documents D4 and D8 would in fact lead to the speed of the wiper blade being reduced in those areas of the windscreen. Although this view was clearly expressed by the Board in its communication of 4 October 1991 the Respondents have filed no further arguments to contradict it or to show why the skilled man would have taken the further step necessary to arrive at the windscreen wiper claimed, and the Board can find nothing in the state of the art which would have led him to do so.

Accordingly, the Board comes to the conclusion that the subject-matter of present Claim 1 cannot be derived in an obvious manner from the state of the art and therefore involves an inventive step (Articles 52(1) and 56 EPC).

Thus Claim 1 and its dependent Claim 2, which relates to a preferred embodiment of the windscreen wiper according to Claim 1, provide a suitable basis for maintenance of the patent in amended form.

6. In view of the above the Appellants' subsidiary request for oral proceedings may be disregarded.

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 maintain the patent on the basis of the following documents:

Claims: Claims 1 and 2 received on 3 December 1991 with letter dated 2 December 1991;

Description: columns 1 to 5 of the patent specification with column 1, line 35 to column 2, line 10 replaced with pages 1a, 1b and 1c received on 3 December 1991 with letter dated 2 December 1991;

Sheets 1 and 2 of the drawings as published.

The Registrar: The Chairman:

S. Fabiani F. Gumbel