

DECISIONS OF THE BOARDS OF APPEAL

Decision of Technical Board of Appeal 3.5.2

dated 10 July 1996

T 501/94 - 3.5.2

(Translation)

Composition of the board

Chairman: W.J.L. Wheeler

Members: M.R.J. Villemin

M. Schar

Patent proprietor/Appellant: Delphi Automotive Systems Deutschland GmbH

Opponent/Respondent: AMP Incorporated

Headword: Electrical double leaf spring contact/DELPHI GmbH

Article: 56, 114(2) EPC

Keyword: "Inventive step (yes)" - "Document only submitted towards the end of oral proceedings not added to file"

Headnote

I. Written state of the art which is only mentioned and offered for inspection by an opponent after the parties have presented their main submissions during oral proceedings may be regarded by the board as late-submitted under Article 114(2) EPC and does not need to be added to the file.

II. A document indicated in a contested patent as the closest or important prior art for the purposes of elucidating the technical problem set out in the description forms part of the opposition or opposition appeal proceedings even if not expressly cited within the opposition period (see decision T 536/88, OJ EPO 1992, 638). However, a document indicated in a citation as the closest or important prior art for the purposes of elucidating the technical problem set out in the citation does not automatically form part of the opposition or opposition appeal proceedings if it has not been expressly cited within the opposition period.

Summary of facts and submissions

1. The patent proprietors appealed against the decision of the opposition division revoking European patent No. 0 189 821. The ground for revocation was that the subject-matter of claim 1 did not involve an inventive step, in view of:

D1: EP-A-0 114 187 and

D2: US-A-4 168 880.

II. Claim 1 of the contested patent reads as follows:

"1. Electrical double leaf spring contact (1)

- with rear connection elements (2, 3) for an electrical conductor wire,
- with a central, box-shaped spring main part (5) which comprises a top surface part (6), side walls (7, 8) and base parts (9, 10) divided longitudinally by a separating slit (11),
- with two front spring arm pairs (12, 13) moulded to the base- (9, 10) and to the top surface part(s) (6), and
- with an external reinforcing spring (25) divided with a longitudinal slit (35),
- with a rear reinforcing spring main part (26) comprising a base part (31), two side walls (33, 34) and a top surface part (32), adapted to the cross-section of the main part (5) of the spring and locked in a form-fitting manner on the main part (5) of the spring to prevent longitudinal displacement, and
- with two front reinforcing spring pairs (27, 28) which are moulded to the base part (31) or

to the top surface part (32) and which press outwardly on the spring arm pairs (12, 13), - characterised in that the longitudinal slit (35) in the main part (26) of the reinforcing spring is peripherally staggered in relation to the separating slit (11) of the main part (5) of the spring, and in that the wall (33, 34 or 32) of the main part (26) of the reinforcing spring, provided with the longitudinal slit (35), engages with two lugs (37) arranged on either side of the longitudinal slit (35) and bent at right angles into a recess (16, 17) of the unslit wall (8, 7 or 6), lying beneath, of the main part (5) of the spring, is supported radially, ie on stop edges (20, 21), in the recess (16, 17) and prevents the main part (26) of the reinforcing spring from expanding."

Claims 2 to 7 are dependent on claim 1.

III. Replying to the statement of grounds for appeal, the respondents drew attention to the following document:

D4: US-A-4 341 434.

The board took account of D4 in the enclosure accompanying the summons to oral proceedings.

IV. Oral proceedings were held on 10 July 1996.

V. The appellants' arguments can be summarised as follows:

The patented subject-matter according to the preamble to claim 1 was a double leaf spring contact designed for use with a flat electric plug. A double leaf spring contact of similar construction was known from D1. In a contact of this type, the slit in the main part of the spring was located on the same side as the slit in the main part of the reinforcing spring. This meant that the reinforcing spring could not prevent the main part of the spring from expanding. The insertion of a flat electric plug could therefore cause the box-shaped parts of the double leaf spring contact and the reinforcing spring to expand. The purpose of the present invention was to improve the double leaf spring contact disclosed in D1 in such a way as to prevent the main parts of the spring and reinforcing spring from

expanding.

D2 showed a round socket body (11) with an external spring cage (12). The spring cage was connected with the socket body at two points by means of anchoring lugs (38, 39) which engaged with apertures (40, 41) in the wall of the socket body. However, whereas the main part of the reinforcing spring (26) according to the contested patent was securely prevented from expanding, D2 stated that the end portion (37) of the spring cage enclosed the socket body less firmly, preferably with some play. The teaching of D2 conflicted with the teaching of the contested patent. Since D2 suggested a construction which was fundamentally different (not only in the sense of being round instead of box-shaped), using different constructional means, the document in question would on no account lead the skilled person to derive the claimed solution.

The sockets to which D4 related were different from those described in D1 and the contested patent. D4 should therefore be seen as not relevant and should not be taken into account.

VI. The respondents' arguments can be summarised as follows:

(a) To avoid confusion, it is proposed that the terminology used in the contested patent be applied, as far as possible, to D2. This would mean referring to the entire part (11) in D2 as the "spring contact", to the rigid area that holds the spring arms (19, 20) as "the main part of the spring", and to the rigid part of the spring cage (12) bearing the reinforcing spring arms (35a, 35b) as "the main part of the reinforcing spring".

(b) In the enclosure accompanying the summons to oral proceedings, the board of appeal only took account of the subjective problem described in D2. However, it was necessary to consider the entire disclosure of D2, in accordance with the established case law that the technical problem cannot be defined solely by reference to the inventor's subjective conception and description of the problem; instead, it must be assessed on the basis of the objective problem derivable by an expert in the relevant field.

(c) It was clearly also the function of the collar (32) in the contact known from D2 to counteract expansion, especially in the area of the slit (13). Moreover, the possibility could not be ruled out that the locking of the apertures (40, 41) and lugs (38, 39) might

additionally counteract the expansion of the spring contact, as was explicitly mentioned in D2 for the area of the collar.

(d) There was no fundamental difference between box-shaped contacts and round contacts. Apart from the angle of the lugs, which was unimportant, the only difference between the double leaf spring contact according to D1 and the double leaf spring contact according to claim 1 of the contested patent consisted in the fact that the longitudinal slit (35) in the main part of the reinforcing spring (26) was peripherally staggered in relation to the separating slit (11) of the main part (5) of the spring. However, this solution was known to the skilled person from D2, according to which the longitudinal slit (30) of the reinforcing spring (12) was located diametrically opposite, ie peripherally staggered in relation to, the longitudinal slit (13) of the main part of the spring (11).

(e) D2 mentioned that some play remained between the end portion (37) of the main part of the reinforcing spring and the main part of the spring. However, this was immaterial: on the one hand, the scope for play was clearly only one of two possibilities, and on the other, the close fitting of the reinforcing spring (12) around the periphery of the main part of the spring (11) was known from D4, relating to a round contact very similar to that described in D2.

(f) A skilled person, considering the problem, in respect of the double leaf spring contact known from D1, of preventing the main part of the reinforcing spring from expanding, would easily be able to recognise from the teaching of D2 - especially in view of the explanation in column 4, lines 19 to 23 - that the measures known from D2 could be applied to achieve the desired improvement of the double leaf spring contact according to D1. This would not involve an inventive step.

VII. Only after the parties had presented their main submissions did the respondents try to introduce a new prior art citation, arguing that the board could not refuse the introduction of the document because it was cited in D4 and therefore already formed part of the proceedings. The appellants said that the document should not be taken into account, since it was to be regarded as late-submitted under Article 114(2) EPC. The board decided not to add the document to the file.

VIII. The appellants request that the contested decision be set aside and the patent be maintained.

IX. The respondents request that the appeal be dismissed.

Reasons for the decision

1. The appeal is admissible.

2. Late-submitted evidence

2.1 Under Article 114(2) EPC, the European Patent Office - in this case, the board of appeal - may disregard facts and evidence which are not submitted in due time by the parties concerned.

2.2 The first mention of D4 was in the letter of 6 March 1995 replying to the statement of grounds for appeal. The document discloses an electrical spring contact bearing a very close resemblance to the spring contact described in D2; however, the rear end portion of the spring cage is adapted to the cross-section of the socket body. With regard to this feature, D4 is more relevant than D2. The patent proprietor had sufficient time (approximately 16 months) to examine this document before oral proceedings. This meant that the proceedings as a whole were not delayed by taking D4 into account, which the board accordingly did.

2.3 However, a different view must be taken of the opponents' attempt to introduce a new citation during oral proceedings after the parties had made their main submissions. Taking this document into account would have delayed proceedings substantially.

2.4 This citation is mentioned in D4 as important prior art, but this does not mean that it forms part of the proceedings. Although a document indicated **in a contested patent** as the closest or important prior art for the purposes of elucidating the technical problem set out in the description would have to be seen as forming part of the proceedings (see decision T 536/88, OJ EPO 1992, 638), this cannot be taken to imply that a document

indicated **in a citation** as the important prior art would also have to be regarded as forming part of the proceedings. Otherwise the result could be a very long and complex chain of citations. Even if it were feasible, taking such citations into account would considerably delay proceedings.

2.5 The board sees no reason why the late submission of the citation in D4 should be justified by the fact that the opponents' representative had only taken over the case shortly before the oral proceedings (see decision T 430/89 dated 17 July 1991, point 5.3, third paragraph). Moreover, the opponents' representative had not asked the board to defer the oral proceedings to a later date.

2.6 The board takes the view that Article 114(2) EPC allows it to disregard written state of the art which is only mentioned by an opponent during oral proceedings after the parties have presented the main aspects of their respective cases, and even to refuse to add such prior art to the file.

2.7 In view of the fact that the contested patent was not amended, that the submission was extremely belated, and that the patent proprietor is opposed to the suggestion that the late-submitted citation be taken into account, the board has decided not to add the citation to the file, so as to avoid delaying the proceedings.

3. State of the art

3.1 It is undisputed that D1 discloses an electrical double leaf spring contact corresponding to the preamble to claim 1 of the contested patent. The claimed double leaf spring contact differs from the double leaf spring contact known from D1 in two respects:

(a) the longitudinal slit in the main part of the reinforcing spring is peripherally staggered in relation to the separating slit of the main part of the spring, and

(b) the wall of the main part of the reinforcing spring, provided with the longitudinal slit, engages with two lugs arranged on either side of the longitudinal slit and bent at right angles into a recess of the unslit wall, lying beneath, of the main part of the spring, and is

supported radially, ie on stop edges in the recess.

D2 discloses a round-shaped electrical spring contact

- with rear connection elements (15) for an electrical conductor wire,
- with a central, round-shaped spring main part, divided longitudinally by a separating slit (13),
- with two quarter-rounded front spring arms (19, 20) and a half-round relatively inflexible contact arm (22) which are integral with the spring main part, the contact arm (22) being longer than the spring arms (19, 20) and its front end being provided with a ring-shaped collar (21) through which a contact pin may be inserted,
- with an external reinforcing spring, referred to as a "spring cage" (12), divided with a longitudinal slit (30), which is adapted to the round cross-section of the spring main part and is locked in a form-fitting manner on the half-round contact arm (22), to prevent longitudinal displacement, and which has a pair of reinforcing springs (35a, 35b) that press on the outside of the spring arms (19, 20),
- with a rear, round-shaped reinforcing spring main part (37), originating from the reinforcing spring and extending between the preventive lugs (42) and the beginning of the slit (36) dividing the pair of springs (35a, 35b),
- the longitudinal slit (30) in the reinforcing spring (12) being peripherally staggered in relation to the separating slit (13) of the spring main part, and
- the reinforcing spring (12) having two pairs of lugs (38, 39), arranged on either side of the longitudinal slit (30) and bent at right angles, which engage with two apertures (40, 41) of the unslit half-round contact arm (22) lying beneath, are supported radially, ie on stop edges, in the apertures (40, 41) and prevent the reinforcing spring (12) from expanding.

The claimed double leaf spring contact differs from the spring contact known from D2 in that:

(a) it is a double leaf spring contact,

(b) the main part of the spring (5) is box-shaped and comprises a top surface part (6), side walls (8) and base parts (9, 10) divided longitudinally by a separating slit (11),

(c) the double leaf spring contact has two spring arm pairs (12, 13) which are moulded to

the base parts (9, 10) and to the top surface parts (6),

(d) the reinforcing spring (25) has a box-shaped, rear reinforcing spring main part (26) comprising a base part (31), two side walls (33, 34) and a top surface part (32), adapted to the cross-section of the box-shaped main part (5) of the spring and locked in a form-fitting manner on the main part of the spring (5),

(e) the reinforcing spring (25) has two front reinforcing spring pairs (27, 28) which are moulded to the base part (31) or to the top surface part (32), and

(f) the wall of the main part (26) of the reinforcing spring, provided with the longitudinal slit (35), engages with two lugs (37) in a recess (16, 17) of the unslit wall (8, 7 or 6), lying beneath, of the main part of the spring (5).

3.3 D4 discloses an electrical spring contact largely corresponding to the spring contact disclosed in D2. But whereas in D2 the rear end portion of the reinforcing spring (12) encloses the socket body (11) less firmly, preferably with some play, the rear end portion of the reinforcing spring (12) in D4 is adapted to the cross-section of the socket body and firmly connected to the socket body. The connection is provided by anchoring elements (53) located on the socket body which engage with apertures (51) in the reinforcing spring, lying above, and prevent the reinforcing spring from expanding.

4. Inventive step

4.1 D1 is considered to be the document representing the closest prior art . In this prior art, the slit in the main part of the spring is disposed on the same peripheral side as the slit in the main part of the reinforcing spring. The introduction of a flat electric plug can cause an expansion of the box-shaped parts of the double leaf spring contact and the reinforcing spring. In this prior art, no measures have been taken to ensure that the main part of the spring and the main part of the reinforcing spring are securely prevented from expanding.

4.2 On the basis of the closest prior art according to D1, the objective problem addressed by the contested patent consists in designing an electrical double leaf spring contact in

which the main part of the spring and the main part of the reinforcing spring are securely prevented from expanding.

4.3 This problem is solved as follows:

(a) the longitudinal slit in the main part of the reinforcing spring is peripherally staggered in relation to the separating slit of the main part of the spring, and

(b) the wall of the main part of the reinforcing spring, provided with the longitudinal slit, engages with two lugs arranged on either side of the longitudinal slit and bent at right angles into a recess of the unslit wall, lying beneath, of the main part of the spring, and is supported radially, ie on stop edges in the recess, and prevents the main part of the reinforcing spring from expanding.

Since the main part of the reinforcing spring is adapted to the cross-section of the main part of the spring, the main part of the spring is also prevented from expanding.

4.4 Admittedly, in the electrical spring contact known from D2, the longitudinal slit (30) in the reinforcing spring (12) is peripherally staggered at a 180-degree angle to the separating slit (13) of the main part of the spring. The reinforcing spring (12) is also provided with two lugs (39), arranged on either side of the longitudinal slit (30) and bent at right angles, which engage with an aperture (41) of the unslit half-round contact arm (22), lying beneath, are supported radially, ie on stop edges, in the aperture (41) and prevent the reinforcing spring (12) from expanding. But the main part of the reinforcing spring (37) is not adapted to the cross-section of the main part of the spring and locked in a form-fitting manner on the main part of the spring. On the contrary, the collar (21) is tightly enclosed by the front end portion of the reinforcing spring (32). The rear end portion (37) of the reinforcing spring (12), serving as the main part of the reinforcing spring, encloses the part of the socket body (11), serving as the main part of the spring, less firmly, preferably with some play (D2, column 3, lines 53-56). It is noted that this rear end portion (37) of the reinforcing spring (12) does not enclose the socket body (11) in the "central" main part of the spring as described in the contested patent; instead it overlaps a substantial portion of the spring arms (19, 20) and the contact arm (22). The circular front

end portion (32) at the end of the reinforcing spring (12) forms a stop to limit the outward mobility of the spring arms (19, 20).

4.5 In D2, therefore, the collar (21), the spring arms (19, 20) and the main part of the reinforcing spring (37) are prevented from expanding. The portion of the spring main part between the spring arms and the connection elements is not prevented from expanding. The same applies to the tongues (42) on the reinforcing spring (12) which are arranged around the main part of the spring. D2 discloses solution feature (a) (peripherally staggered slits) described in point 4.3 above, but not solution feature (b), according to which the lugs, bent at right angles, engage with a recess of the unslit wall **of the main part of the spring.**

The disclosure of D2 could not therefore lead the skilled person to solve the problem cited in point 4.2, in respect of a double leaf spring contact according to claim 1.

4.6 In the electrical spring contact disclosed in D4, the rear end portion of the reinforcing spring (12) is adapted to the cross-section of the socket body and firmly connected to the socket body. The connection is provided by anchoring elements (53) located on the socket body which engage with apertures (51) in the reinforcing spring, lying above, and prevent the reinforcing spring from expanding. D4 therefore neither discloses nor suggests the second solution feature (b).

4.7 Having considered the issues set out in points 4.1 to 4.6 above, the board concludes that even an unallowable ex post facto mosaic of features taken arbitrarily from D1, D2 and D4 would not lead to the double leaf spring contact according to claim 1 of the contested patent, since the subject-matter of the invention with the solution feature (b) is not suggested by any of these documents. This subject-matter and the subject-matter of the dependent claims 2 to 7 therefore involve an inventive step within the meaning of Article 56 EPC.

5. In view of the foregoing, the board considers that the alleged lack of an inventive step (Articles 100(a) and 56 EPC), cited by the opponents as a ground for opposition, does not prejudice the maintenance of the contested patent as granted.

Order

For these reasons it is decided that :

1. The decision under appeal is set aside.
2. The patent is maintained unamended.