

**Internal distribution code:**

- (A)  Publication in OJ  
(B)  To Chairmen and Members  
(C)  To Chairmen

**D E C I S I O N**  
of 18 November 1998

**Case Number:** T 0704/96 - 3.5.2  
**Application Number:** 91200396.9  
**Publication Number:** 0446980  
**IPC:** H01R 23/68  
**Language of the proceedings:** EN

**Title of invention:**  
Connector assembly for printed circuit boards

**Patentee:**  
Framatome Connectors Belgium N.V.

**Opponent:**  
The Whitaker Corporation

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 56, 113(1), 123(2)  
EPC R. 67

**Keyword:**  
"Added subject-matter - no"  
"Inventive step - yes (after amendment)"  
"Reimbursement of the appeal fee - yes; procedural violation;  
right to be heard"

**Decisions cited:**  
G 0001/88, J 0018/84, J 0037/89, T 0228/89, T 0178/94,  
T 0087/95

**Catchword:**  
-



Europäisches  
Patentamt

European  
Patent Office

Office européen  
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0704/96 - 3.5.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.2  
of 18 November 1998

**Appellant:**  
(Opponent)

The Whitaker Corporation  
Suite 450, 4550 New Linden Hill Road  
Wilmington, Delaware 19808 (US)

**Representative:**

Warren, Keith Stanley  
Baron & Warren  
18 South End  
Kensington  
London W8 5BU (GB)

**Respondent:**  
(Proprietor of the patent)

Framatome Connectors Belgium N.V.  
Antoon Spinoystraat 8  
2800 Mechelen (BE)

**Representative:**

de Vries, Johannes Hendrik Fokke  
De Vries & Metman  
Overschiestraat 184 N  
1062 XK Amsterdam (NL)

**Decision under appeal:**

Interlocutory decision of the Opposition Division  
of the European Patent Office posted 11 June 1996  
concerning maintenance of European patent  
No. 0 446 980 in amended form.

**Composition of the Board:**

**Chairman:** W. J. L. Wheeler  
**Members:** F. Edlinger  
A. C. G. Lindqvist

## Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division on the amended form in which European patent No. 0 446 980 can be maintained.

Opposition was filed against the patent as a whole and based on Article 100(a), (b), and (c) EPC.

The opposition division held that these grounds for opposition did not prejudice the maintenance of the patent as amended, having regard to following documents:

- E1: US-A-4 867 707
- E2: US-A-4 398 783
- E3: US-A-4 494 816
- E4: US-A-4 611 867
- E5: US-A-4 605 269.

- II. The respondent filed amended claims with the letter dated 31 March 1998, but withdrew them in response to the observations of the board in the summons to the oral proceedings, and filed a new main request, claims 1 and 2, with the letter dated 6 November 1998.

- III. Oral proceedings were held on 18 November 1998, during which the respondent further amended the claims, description and drawings of the patent in suit.

Following these amendments, the appellant no longer maintained the grounds for opposition based on Article 100(b) and (c) EPC, but raised new objections against these amendments based on Article 123(2) EPC.

IV. The appellant requested that the decision under appeal be set aside, that the patent be revoked and that the appeal fee be reimbursed.

V. The respondent requested that the appeal be dismissed and that the patent be maintained in amended form on the basis of:

**Claims:** 1 to 15 filed in the oral proceedings;

**Description:** columns 1 to 9 and sheet of inserts to columns 1 and 2, filed in the oral proceedings; and

**Drawings:** figures 1 to 4 of the patent specification,  
figures 5 to 16 filed in the oral proceedings.

VI. Claim 1 is now worded as follows:

"1. Connector assembly (1, 21, 39) for printed circuit boards (7), comprising

a first connector element (2, 40, 56, 61) with a first housing (3) of insulating material and male signal and ground contacts (4,5) regularly arranged in rows and columns and connectable to a printed circuit board, and

a second connector element (8, 43) with a second housing (9) of insulating material, which can be inserted with a mating side (10) into the first housing, and with female signal and ground contacts (11, 16, 52) with a connection element (17, 18), which female contacts are regularly arranged in rows and columns, and will contact the corresponding male contacts when the second housing is received in the first housing,

wherein said second connector element (8, 43) is provided with a plurality of outer conductors (12, 24, 44, 45, 51), each of said outer conductors mainly enclosing at least one signal contact (11, 52) in a circumferential direction and each of said outer conductors having contact means (13, 49, 56) adapted to contact the adjacent ground contacts (5) of the/each corresponding signal contact (4) of the first connector element (2, 40, 56, 61) outside the outer conductor, wherein each outer conductor of the second connector element is provided with a dielectric insert (19, 53), the/each corresponding signal contact being mounted in said insert,

characterized in that the contact means of each outer conductor (12, 24, 44, 45, 51) of the second connector element (8) is formed out of the outer conductor as contact springs (13, 49, 56) for contacting the ground contacts (5) of the first connector element (2, 40, 56, 61),

wherein the outer conductors of the second connector element are arranged in rows and columns, each column comprising at least two outer conductors, wherein in the first connector element, a row of ground contacts (5) is arranged in between two rows of signal contacts (4) and the ground contacts (5) of this row contact, when mated, two adjacent contact springs (13, 49, 56) of adjacent outer conductors in a column."

Claims 2 to 15 are dependent on claim 1.

VII. The appellant (opponent) argued essentially as follows:

- (i) The feature of claim 1: "wherein in the first connector element, a row of ground contacts (5) is arranged in between two rows of signal contacts (4)" infringed Article 123 (2) EPC in that it created an overall change in the content of the application. A connector assembly

comprising only one row of ground contacts in between two rows of signal contacts would change the whole tenor of the application as filed, which emphasized rows of ground contacts on both sides of each row with signal contacts (cf claim 3 and all the embodiments as filed).

The appellant also argued that "a high density of contacts" (sheet of inserts to columns 1 and 2) was not disclosed in the application as filed. This general feature could not be derived from the specific disclosure of spacings of respectively 2 mm and 4 mm (column 3, lines 53 to 58 of the patent specification).

- (ii) Regarding inventive step, the appellant contended that the subject-matter of claim 1 was based on a mere routine choice of arranging the outer conductors in a connector assembly as disclosed by document E1, and thus lacked an inventive step. It was common practice to form contact springs out of the outer conductor and to arrange rows and columns as evidenced by the disclosures of documents E2, E3 and E5. The remaining features were simple design possibilities achievable by any non-inventive artisan. A second row of signal contacts in the connector of E1 represented a mere collocation of constructional details. If the person skilled in the art wished to use a single row of ground contacts, he necessarily had to arrange this row of contacts between the two rows of signal contacts so as to contact both outer ground contact springs. This assembly did not solve any additional problem, provided no technical advantage, nor any unexpected results, and was

obvious in view of the prior art disclosed in document E1. The respondent's contention that E1 taught special female ground contacts was not entirely correct because claim 3 also envisaged using special male ground contacts.

- (iii) Regarding the request for reimbursement of the appeal fee, the appellant argued that the opposition division had not given him sufficient opportunity to comment on the text on which the amended patent was maintained. While he acknowledged that he had been sent a copy of the amended text annexed to a formal brief communication dated 9 May 1996, a decision taken within less than one month after this communication was totally surprising in view of the circumstances.

The communication of 22 December 1995 (point 2) was inconsistent in that it indicated that the relevant feature ("contacts ... outside the outer conductor") was disclosed in "both document A1 and the patent specification" (A1 is now E1). Nevertheless, the inclusion of this known feature was considered to inventively distinguish the claimed subject-matter.

The appellant filed observations, based on a guess of possible amendments, with letter dated 26 April 1996. He could rightly expect that the opposition division would follow the practice explained in the Notice from the European Patent Office dated 14 July 1989 (published OJ EPO 1989, 393) concerning the application of Rule 58(4) EPC (point 2.1) which made clear that an opponent was to be given sufficient opportunity to comment on the actual text submitted by the patentee. In not doing so, the

opposition division committed a substantial procedural violation, which necessitated the present appeal because further substantial amendments to the patent specification were required to overcome the appellant's objections as it turned out in the appeal proceedings. For these reasons, reimbursement of the appeal fee would be equitable.

VIII. The respondent (patentee) argued essentially as follows:

- (i) Regarding the objection under Article 123(2) EPC, the respondent contended that a connector assembly with only one row of ground contacts between two rows of signal contacts was within the content of the application as filed. The arrangement, as shown eg in figure 5, permitted a high density of contacts to be achieved independently of whether there were outer ground contacts or not. The feature "a high density of contacts" was derivable from the description (spacing of contact pins 2 mm).
  
- (ii) Concerning inventive step, the respondent agreed with the appellant that the closest prior art was disclosed in document E1. The objective problem with respect to this prior art consisted in making such connector assemblies suitable for a high density pin field. The person skilled in the art was taught by E1 to use special female contacts attached to the signal contacts and would be led away from using coaxial type connectors (E1, column 1, lines 27 to 34). Placing a row of ground contacts in between two



rows of signal contacts was part of the invention and was not possible with the arrangement disclosed in E1. The appellant's arguments were therefore based on hindsight knowledge of the invention.

- (iii) Regarding the alleged procedural violation, the respondent observed (letter dated 20 January 1997, point 4) that the appellant did have an opportunity to comment on the proposed amendments.

### Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*
  - 2.1 Claim 1 essentially constitutes a combination of claims 1, 2 and 5 as filed. In the course of the appeal proceedings, this combination has been further limited and clarified with respect to the arrangement in rows and columns, at least two outer conductors in each column and the contacting of ground contacts (of the first connector element) with the contact springs outside the outer conductor and in between two rows of signal contacts. These features are best seen in the original figures 1, 3, 5 and 8 and are also supported by features of claims 3 ("rows and columns") and 4 ("one or more signal contacts" in a column) as well as the description (page 4, lines 33 to 40, page 5, lines 14 to 17) as filed.
  - 2.2 It was not contested that a row of ground contacts arranged in between two rows of signal contacts is disclosed as such (see figures 1, 3, 5 as filed).

Claim 1 and page 2, paragraph 1 of the application as filed specified, quite generally, contacting of "adjacent ground contacts". Preferred embodiments comprised rows or columns "with only ground contact pins (5)" which contact one of four contact springs (claim 4; figures 3 and 5; page 4, lines 33 to 40; page 11, lines 8 to 16). The person skilled in the art would therefore understand from the overall disclosure of the application as filed that a single row of ground contact pins arranged in between two rows of signal contacts, each of which ground contacts, when mated, contacted two adjacent contact springs of the adjacent outer conductors in a column was contemplated, and would have the described advantage that, in the mated connector assembly, the ground contacts would urge the contact springs towards a closed position of the outer conductors, thereby improving the electrical performance by reducing openings of the outer conductors, and providing a high density of contacts at low cost (see page 1, line 22 - page 2, line 38 and page 12, lines 1 to 9).

The board therefore concludes that a row of ground contacts arranged in between two rows of signal contacts does not constitute subject-matter extending beyond the content of the application as filed.

2.3 The application as filed (page 5, paragraph 1; page 9, paragraph 1) disclosed contact pin spacings of some millimetres. The vague and general term "high density of contacts" does not add any specific technical information which is not derivable from the general disclosure (see point 2.2 above) and the specific spacings disclosed in the initial application.

2.4 Claim 1 is also uncontestedly more limited than claim 1 as granted. The amendments therefore do not contravene Article 123(2) and (3) EPC.

2.5 The description and drawings have been adapted to the amended claims, which involved cancellation of some particular embodiments. These amendments do not infringe Article 123 EPC either.

3. Novelty of the subject-matter of claim 1 was not contested.

4. *Inventive step*

4.1 The board agrees with the parties that document E1 discloses the nearest prior art. The contested patent (column 1, third paragraph) acknowledges that the features of the preamble of claim 1 are known from document E1.

The first connector element of E1 (figure 7) comprises regularly arranged male signal and ground contact pins connectable to a printed circuit board (column 1, lines 14 to 23 and column 4, lines 4 to 5). A first housing of insulating material into which a second connector element with a housing can be inserted or is received is not disclosed in this document. Since this over-specification of the prior art in the preamble of claim 1 was in the claim as granted and did not arise out of the amendments made during either the opposition or appeal proceedings, it will not be pursued by the board.

The second connector element of E1 includes an insulating housing (1) with only one row of female signal contacts (8) and only one row of ground contacts (5). A plurality of outer conductors (4) enclose signal contacts (8) within dielectric inserts (12). The connector assembly is so designed that it "preserves the electrical quality of a coaxial transmission system through to a printed circuit board, and maintains

compatibility with modern high density mass pluggable signal requirements" (E1, column 2, lines 22 to 28). Each of the outer conductors (4) has contact means (5) to contact the adjacent ground contacts of the first connector element (figure 7: 18) outside the outer conductor. These contact means are mechanically and electrically attached to the outside of a metal shell (E1, column 2, lines 5 to 21; claim 1).

4.2 The connector assembly of present claim 1 is therefore distinguished from this prior art by the features of its characterising part and in that it has a first housing (3) of insulating material for receiving the second housing (9). In short, each column of the rows of conductors comprises at least two outer conductors with contact springs formed out of these conductors, and ground contacts of the first connector element, arranged in between two rows of signal contacts, contact two adjacent outer conductors when the connector elements are mated.

4.3 The embodiments, as best shown in figures 5 and 8, demonstrate that this arrangement permits a high density of contacts while preserving the electrical quality of a transmission line character at low manufacturing cost (column 2, lines 15 to 19 and column 9, lines 23 to 26 of the patent specification).

The objective problem with respect to the prior art disclosed in E1 is therefore seen in an improvement of the density of contacts at low manufacturing cost (see also 4.1 above).

4.4 Documents E2 (figures 5 and 6: 54) and E3 (figure 1: 28, 29) show outer contact springs, but the ground contact pins make contact within the outer conductors. E5 discloses contact springs (figures 2 and 3: 50; 86) outside the outer conductors, but they serve as latches and may be used to contact a thin coating of the interior of a housing (E5, column 5, lines 1 to 5 and 39 to 45).

E4 discloses a coaxial multicore receptacle comprising a plurality of ground pins arranged in a matrix pattern where metallic lattice boards form a square grid. Coaxial ground spring segments (30) are contacted by an outer conductor on the periphery of a coaxial contact (figure 6, column 7, lines 11 to 20), and ground contact pins (12) make contact with contact springs (24) of lattice boards (21), not with contact springs formed out of outer conductors (figures 8 and 10, column 5, lines 18 to 32).

None of the cited documents hints at arranging ground contacts in between two contact springs of outer contacts enclosing signal contacts. Several coaxial cable connexions of a similar type and also a square grid are already mentioned in document E1 (column 1, lines 34 to 62), but the authors of E1 found such devices unsuitable for use with miniaturized standard posts (column 1, lines 27 to 33, lines 47 to 49 and 57 to 58). The person skilled in the art departing from the state of the art disclosed in E1 thus would not find any hint in these documents to arrange the outer conductors as specified in present claim 1.

4.5 The board therefore cannot agree with the appellant that the subject-matter of claim 1 merely amounts to a collocation of constructional details in view of the solution presented in E1. Even if the person skilled in the art had had the idea of arranging outwardly bent

contact springs formed out of the metal shell (4) in place of separate ground contacts (5) attached to the shell, he would still have had essentially the same arrangement of one row of ground contacts above a row of signal contacts as in figures 1 and 2 of E1. A next step of arranging further rows of signal and ground contacts could be conceived to increase the number of contacts, or to reduce manufacturing cost, by arranging more than two rows within a common housing; but again, there is no indication that the skilled person would then arrange a row of ground contacts to contact adjacent contact springs on either side of this row since the whole arrangement could simply be doubled.

Similarly, there is no indication in the cited prior art that an obvious need would arise to arrange only one row of ground contacts which then would necessarily be arranged in between two rows of signal contacts.

It follows from the foregoing that a series of steps have to be taken to solve the above problem. The board is however satisfied that there is no evidence that it would have been obvious to a person skilled in the art to carry out all these steps without hindsight knowledge of the present invention (see established case law on "Could-would approach", Case Law of the Boards of Appeal of the European Patent Office, 1996, I.D-6.1).

The subject-matter of claim 1 and that of the dependent claims 2 to 15 thus involves an inventive step within the meaning of Article 56 EPC.

5. In the result, the board is of the opinion that the patent, as amended according to the respondent's request, and the invention to which it relates, meet the requirements of the EPC.

6. *Reimbursement of the appeal fee (Rule 67 EPC)*

6.1 Allowability of the appeal constitutes a prerequisite for reimbursement of the appeal fee. The boards of appeal have held in several decisions that this may be the case if the appeal is only partly allowed, provided that the board, in substance at least, follows the request of the appellant (see J 18/84, OJ 1987, 215, point 2.8; J 37/89, OJ 1993, 201, point 6; and the unpublished decisions T 228/89, point 4.2; T 178/94, point 9; and T 87/95, point 7).

In the present case the board does not follow the *ratio decidendi* of the opposition division, but has come to the conclusion that the decision is to be set aside and that the patent can be maintained only after substantial further amendments to claim 1 and consequential cancellation of some of the embodiments in the patent as granted.

6.2 The board is of the opinion that the first instance has committed a procedural violation in that it did not give the appellant sufficient opportunity to comment on the text submitted by the patentee (Article 113(1) EPC).

The fact that the appellant had presented tentative comments in the letter dated 26 April 1996 (point 1.5) on the assumption that the patentee would file amendments of claim 1 along the lines proposed by the opposition division does not excuse the opposition division from not following the practice advertised in

the notice from the European Patent Office dated 14 July 1989 (see OJ 1989, 393; points 2.1 and 2.3), because the prerequisites for an immediate interlocutory decision were not yet fulfilled. Decision G 1/88 referred to in this notice made clear that an opponent was to be given sufficient opportunity of commenting on the **new text** (emphasis added). This opportunity could have been given through the application of Rule 58(4) EPC (see G 1/88, OJ 1989, 189; point 6).

The amended claims and pages of the description had been communicated to the appellant (opponent) with a brief communication ("Please take note") dated 3 May 1996 which did not set any time limit for reply. The contested decision is dated 11 June 1996, ie less than one month after the date on which said communication was deemed to have been delivered under Rule 78(3) EPC.

Even though the new claim 1 was substantially in line with the proposal expressed by the opposition division, the appellant should have been accorded an opportunity to comment on the actual text submitted, because this could have given cause for new objections, such as inadmissible amendments, lack of clarity and lack of support in the description.

6.3 The board finds reimbursement of the appeal fee equitable since the appellant could legitimately expect to be given a time limit for commenting on the new application documents, and had to file this appeal in order to recover the procedural right to an opportunity to comment on the actual documents on which the decision was based.

6.4 The board is of the opinion that the failure to follow the EPO practice referred to by the appellant is aggravated by the fact that the appellant had filed an



additional document (E5), in *bona fide* response to the opposition division's proposal, to support an objection of lack of inventive step of the proposed amended subject-matter. The opposition division neither commented in substance nor gave any reasons why the facts should be disregarded under Article 114(2) EPC before taking its decision, despite the fact that the opponent had signalled reasoned disagreement with the proposals. Nor was the patentee given an opportunity to react to the newly cited document E5. The first evaluation of these facts and arguments (tantamount to disregarding them) was thus given in the decision under appeal.

Had the parties been given their due opportunity to comment on and react to the newly cited document E5, this could have led to further amendments of the patent in suit, so that this appeal may not have been necessary.

**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 in amended form in the following version:

**Claims:** 1 to 15 filed in the oral proceedings

**Description:** columns 1 to 9 and sheet of inserts to columns 1 and 2, filed in the oral proceedings

**Drawings:** figures 1 to 4 of the patent specification and figures 5 to 16 as filed in the oral proceedings


3. The appeal fee is to be reimbursed.

The Registrar:



M. Kiehl

The Chairman:



W. J. L. Wheeler