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D E C I S I O N
of 23 June 1995

Case Number: T 0261/94 - 3.5.2

Application Number: 87200611.9

Publication Number: 0243998

IPC: H01R 4/24

Language of the proceedings: EN

Title of invention:
Contact strip

Patentee:
E.I. DU PONT DE NEMOURS AND COMPANY, et al

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56

Keyword:
"Novelty and inventive step - yes (after amendment)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0261/94 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 23 June 1995

Appellant: E.I.DU PONT DE NEMOURS AND COMPANY
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 11 October 1994 refusing European patent application No. 87 200 611.9 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: R. G. O'Connell
L. C. Mancini

Summary of Facts and Submissions

I. The Appellant contests the decision of the Examining Division to refuse European patent application No. 87 200 611.9. The reason given for the refusal was that the subject-matter of Claim 1 then on file was not new in view of US-A-3 197 729 (D1). In the first instance proceedings FR-A-2 234 677 (D2) and FR-A-2 122 159 (D3) were also considered to be relevant, in combination with D1, for assessment of inventive step of the subject-matter of the application.

II. In reply to a communication of the Board, the Appellant filed new Claims 1 to 5 (main request) replacing the claims previously on file, together with an amended description and amended drawings deleting some embodiments (see paragraph V below). An auxiliary request was also submitted.

III. Claim 1 (main request) is now worded as follows:

"1. Contact strip terminal for electrically interconnecting at least one flat conductor of a flexible conductor film with at least a conductor lead wire, said contact strip terminal comprising a strip-type base part (2) of electrically conducting material and at least one group (3; 4) of teeth (5) projecting outwards relative to a first surface of said base part (2) for contacting at least one flexible conductor of said flexible conductor film, in which each group (3; 4) of teeth (5) consists of four pointed triangular teeth, the base of each triangle mainly coinciding with the first surface of said base part (2), each group (3; 4) of teeth (5) being placed within the periphery of the strip-type base part (2), so that the base line of the teeth (5) of each group lies on a simple closed contour, wherein each tooth (5) has a sharp pointed end (9) and

projects over its total length mainly at a right angle away from said first surface of said base part (2), the contact strip terminal further comprising at least one lip-like member (21, 22, 23; 32, 33) projecting from a longitudinal edge of the base part (2) and being deformable in the direction of the base part for clamping said conductor lead wire (25; 30, 31) between said lip-like member (21, 22, 23; 32, 33) and said base part (2), characterized in that said at least one lip-like member (21, 22, 23; 32, 33) projects from a second surface of said base part (2) opposite to said first surface and in that a second group (7) of teeth (5) projects from said second surface of said base part (2) and is situated next to said at least one lip-like member (21, 22, 23; 32, 33) in order to receive said conductor lead wire (25; 30, 31) when clamped by said at least one lip-like member (21, 22, 23; 32, 33)."

Claims 2 to 5 are dependent on Claim 1.

IV. The Appellant argued essentially that, as was shown in Figures 1 and 6 of D1 - the agreed closest prior art - the prior art terminal was suitable only for connection to an end part of a flat conductor near the edge of a flexible conductor film by virtue of the fact that the flat conductor contacting groups 16 of teeth projected from the base part 19 in the same direction as the conductor lead wire clamping section 18. In contrast, in the terminal as now claimed the flat conductor contacting group of teeth projected in the opposite direction to the lead wire clamping lip-like member thus permitting the flexible conductor film to be contacted at any point while, in addition, a second group of teeth situated next to and projecting in the same direction as the lip-like member provided for an excellent electrical connection between the terminal and the conductor lead wire without the need to strip insulation from the

latter. The combination of features providing these advantages was neither disclosed nor suggested by D1 nor any combination of prior art documents.

V. The Appellant's main request was that the decision under appeal be set aside and a patent granted on the basis of the application in its present form, namely:

Claims: 1 to 5 filed 22 December 1994.

Description: Pages 1 to 5, 9 to 15 and 17 filed 22 December 1994; no pages 6, 7, 8 and 16.

Drawings: Sheets 1 to 3 filed 22 December 1994.

Reasons for the Decision

1. The appeal is admissible.

2. Article 123(2) EPC (Main request)

Present Claim 1 corresponds, in essence, to a combination of the features of Claims 1, 3 and 6 as originally filed with features shown in Figure 11 of the originally filed drawings. In the opinion of the Board, the present form of the application does not infringe Article 123 (2) EPC.

3. *Novelty (Main request)*

None of the prior art documents cited in the European search report discloses a contact strip terminal comprising all the features recited in Claim 1. Thus, the subject-matter of the independent Claim 1 is novel within the meaning of Article 54 EPC.

4. *Inventive step (Main request)*

4.1 Claim 1 is delimited with respect to D1 which, in the view of the Board, constitutes the closest prior art, being the only cited document which explicitly discloses a terminal for connecting a flat flexible conductor film with a conductor lead wire, and it discloses more of the features of Claim 1 than are disclosed in the other cited documents.

4.2 Relative to D1 the problem addressed by the present application is seen by the Board as (i) enabling the lead wire to be connected at an arbitrary position on the film and not just at the edge and (ii) providing a more secure and convenient electrical connection for the lead wire.

4.3 The modifications to the D1 terminal which plausibly achieve these advantages are specified in the characterising features of Claim 1.

4.3 The posing of the problem does not, in the view of the Board, of itself contribute significantly to inventive step since it is a requirement which would be expected to arise routinely, given that flying leads are notorious in interconnection practice. To arrive, however, at the solution claimed involves two significant modifications of the D1 terminal. As shown in D1, the teeth and clamping means for the lead wire all protrude from the same surface of the base part for contacting the flat conductor and none of the teeth contact the lead wire. The modifications which have to be envisaged are: (i) the left-hand group of teeth as shown in Figure 2 of D1 has to be inverted in direction to overcome the problem of the wire clamp obstructing contact of the teeth with the film and (ii) the right-hand group of teeth has to be repositioned to cooperate

with the clamp in piercing and retaining an insulated lead wire. These modifications to the D1 terminal are not inherently obvious to a person skilled in the art nor are they suggested by the cited documents D2 and D3.

4.4 This assessment takes account of the fact that connectors combining insulation piercing teeth and a crimping action for use in joining round insulated wires are well known, e.g. from D3. There is no suggestion in D3 that outwardly protruding teeth could be provided for contacting a flat conductor of a flexible conductor film.

4.5 Similarly, although Figure 1b of D2 does show teeth projecting from opposite surfaces of a terminal base, neither of these groups of teeth is for contacting a lead wire; indeed the terminal shown in this figure is solely for interconnecting two flat cables.

4.6 In the result the Board considers that it would not be obvious for the person skilled in the art starting from D1 and knowing D2 or D3 and common general knowledge in the art to arrive at a contact strip terminal as specified in Claim 1. Thus the subject matter of Claim 1 involves an inventive step within the meaning of Article 56 EPC.

5. In the opinion of the Board, the amended application documents of the main request meet the requirements of the EPC. The auxiliary request need not be considered.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent according to the Appellant's main request (see paragraph V above).

The Registrar:

M. Kiehl

The Chairman:

W. J. L. Wheeler