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**D E C I S I O N**  
**of 7 June 2006**

**Case Number:** T 0734/04 - 3.5.02

**Application Number:** 02016306.9

**Publication Number:** 1280166

**IPC:** H01B 3/44

**Language of the proceedings:** EN

**Title of invention:**

An environmentally non-hazardous wire harness

**Applicant:**

Ricoh Company, Ltd.

**Opponent:**

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**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step - after amendment (yes) "

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0734/04 - 3.5.02

**D E C I S I O N**  
of the Technical Board of Appeal 3.5.02  
of 7 June 2006

**Appellant:**

Ricoh Company, Ltd.  
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Tokyo 143-8555 (JP)

**Representative:**

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**Decision under appeal:**

Decision of the Examining Division of the  
European Patent Office posted 5 March 2004  
refusing European application No. 02016306.9  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** W. J. L. Wheeler  
**Members:** J. M. Cannard  
C. Holtz

## Summary of Facts and Submissions

I. The appellant contests the decision of the examining division to refuse European patent application No. 02 016 306.9. The reason given for the refusal was that the subject-matter of claim 1 filed with the letter dated 11 December 2003 did not fulfil the requirements of Article 52(1) EPC in the meaning of Articles 54(1) and (2) EPC.

II. The documents:

D1: GB-A-1 136 419,

D2: WO-A-89/00759,

D3: WO-A-89/00760, and

D4: US-A-5 057 345,

considered in the first instance proceedings, remain relevant to the present case.

III. During the oral proceedings held on 7 June 2006 before the Board of appeal, the appellant filed claims in respect of a main request and three auxiliary requests.

Claim 1 according to the main request reads as follows:

"A wire harness, comprising:

a plurality of cables (4), each cable consisting of:

one or more conductive line (7) for electrically connecting between electric components; and a core insulating tube (8) for insulating the above-mentioned one or more conductive lines, wherein the core insulating tube consists of a single one of a non-environmentally-hazardous material, which is substantially free of bromine or chloride and which is selected from the group consisting of a PTFE resin, an olefin resin, a polyester resin, and a rubber material such that it produces none of a poisonous gas or material of bromine or chlorine and dioxin; and optionally a hydroxide compound.

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the expression "one or more conductive line(s)" is replaced by the expression "a plurality of conductive lines".

Claim 1 of the second auxiliary request differs from claim 1 of the main request in substance by the non-environmentally-hazardous material which "is selected from an olefin resin, a polyester resin and rubber material".

Claim 1 of the third auxiliary request reads:

"A wire harness, comprising:

at least one cable (4), each cable consisting of:

one or more conductive line(s) (7) for electrically connecting between electric components; and

a core insulating tube (8) for insulating the above-mentioned one or more conductive line(s), characterised in that the core insulating tube consists of a single one of a non-environmentally-hazardous material, which is substantially free of bromine or chloride and which is selected from polyethylene, natural rubber material, styrene, and silicon (*sic*) such that it produces none of a poisonous gas or material of bromine or chlorine and dioxin; and optionally a hydroxide compound.

Claims 2 to 4 of the third auxiliary request are dependent on claim 1.

IV. The appellant's arguments may be summarized as follows:

All the requests related to a wire harness comprising cables in which the core insulating tube consisted of a single one of a non-environmentally-hazardous material selected to be free of bromine or chloride and dioxin. None of the cited prior art documents was concerned with a solution to environmental problems. The cited prior art did not suggest the claimed invention. Documents D1 to D3 all disclosed cables in which the core insulating tube comprised at least two different layers having different compositions. D1, in particular, was concerned with the problem of providing cables used in aircraft industries with a colour coding which would not impair the insulating properties of the insulating PTFE coating, nor would necessitate to maintain a stock of wire for each colour. The skilled person who was an electrical expert would not have considered avoiding the outer layer which contained the colour pigments and was considered necessary by the chemical department. A number of advantageous effects were provided by the

invention: the cables of the claimed wire harness had a clear material structure which minimised the number of materials to be used and rendered the fabrication easier. One could foresee which materials or gases would be discharged in case of fire or which gases could evaporate from the cables, which was important as they were intended for use in electrical office equipment.

- V. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of:

claims 1 to 8 (main request) or claims 1 to 8 (first auxiliary request) or claims 1 to 7 (second auxiliary request); or claims 1 to 4 (third auxiliary request) and description, page 1 to 6; all as filed in the oral proceedings; and drawings, figures 1 to 5 as originally filed.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Main, first and second auxiliary requests*

2. Document D1 discloses a cable which may advantageously be included in a wire harness used for instance in the aircraft and motor industries. The cable consists of a plurality of conductive lines, an inner core insulating tube consisting of PTFE and an outer insulating coating which comprises a PTFE dispersion containing pigments for providing the cable with colour coding.

2.1 D1 thus discloses a wire harness which comprises the following features of claim 1 according to the main and first auxiliary requests: a plurality of cables, each cable consisting of one or more conductive lines and a core insulating tube for insulating the conductive lines. In the cables of the wire harness according to claim 1, however, the core insulating tubes consist of a single insulating material, which may be a PTFE resin, and do not comprise an outer coating of different composition.

3. According to the description of the present patent application, the invention relates to a wire harness which is for use in electric office equipment and home appliances. At the priority date of the patent application (in 2001), the person skilled in the field of electric cables could not ignore the usual environmental requirements for office equipment, particularly those relating to poisonous gases such as bromine, chlorine or dioxin, which can be produced by insulating means in case of fire. He would also be aware of the fact that a PTFE resin would satisfy these requirements, in particular in view of the fact that PTFE resins are considered to be suitable for insulating cables designed for use in aircraft where severe safety requirements apply. Furthermore, D1 explains that the use of PTFE as an electrically insulating coating for wire is widely accepted because of its resistance to chemicals and to high temperatures (page 1, lines 22 to 26).

4. According to the teaching of D1, in the applications where coloured coatings are necessary for identifying

the electrical conductors, as for instance in the aircraft and motor industries where a number of electrical connections must be made from one end of a vehicle to another, the insulating properties of the coating are impaired by the pigments providing the colour coding. This problem was solved in D1 by providing an inner tube consisting of a PTFE resin and an outer coating comprising the pigments (page 1, lines 9 to 50).

5. The above considerations do not apply, however, to cables for use in office equipment, because only relatively short cables are needed and any coding is usually achieved by means of suitable plugs. In these circumstances, it would be obvious to the skilled person that he could reduce the cost by dispensing with the coloured outer layer of the cables of D1, because colour coding is not necessary. It may be true that the simple structure of the core insulating tube of the cable specified in claim 1 enables a prediction of the materials or gases which would evaporate from the cables when used in electrical office equipment, or which could be discharged from the cables in case of fire. However, the person skilled in the cable manufacturing art would be aware of the well-known properties of a PTFE resin and would have expected such an effect. In the judgement of the Board, a skilled person wishing to provide a non-environmentally hazardous cable harness would, by simply using his own general knowledge reinforced by D1, arrive in an obvious manner at a wire harness in which the cable insulating material consists of a PTFE resin, as recited in claim 1 of the main and first auxiliary requests.

6. In claim 1 of the second auxiliary request the non-environmentally-hazardous material may consist of an olefin resin, for instance a polyethylene resin (published application paragraph [0019]). Since a PTFE resin (i.e. a polytetrafluoroethylene resin) can be understood as a particular polyethylene resin, the above considerations relating to claim 1 of the main and first auxiliary requests apply equally to the subject-matter of claim 1 of the second auxiliary request.

7. In view of the above considerations, the subject-matter of claim 1 of each of the main and first and second auxiliary requests does not involve an inventive step.

*Third auxiliary request - Admissibility of the amendments*

8. The Board is satisfied that the claims and the description according to the third auxiliary request meet the requirements of Article 84 EPC and do not contravene Article 123(2) EPC.

8.1 This applies in particular to claim 1 which differs from claim 1 as originally filed in substance by the limitation of the insulating means to a core insulating tube which "consists of a single one of a non-environmentally-hazardous material, which is substantially free of bromine or chloride and which is selected from polyethylene, natural rubber material, styrene, and silicon" and by the incorporation of the optional feature "and optionally a hydroxide compound". The core insulating tube and the optional feature are disclosed at page 4, lines 6 to 15 of the application

- as filed. The Board has noticed an obvious clerical error in claim 1, indicated by (*sic*) in section III above, it being clear from the application as a whole that "silicon" is intended to read "silicone". This is an obvious clerical error which may be corrected by the examining division with the agreement of the applicant.
- 8.2 The description has been adapted to the amended claims, unclear passages have been deleted, and a mention of the prior art known from documents D1 to D4 has been included.
9. The novelty of claim 1 according to the third auxiliary request is not in dispute because none of the cited prior art documents discloses a cable consisting of one or more conductive lines and a core insulating tube consisting of a single one of a non-environmentally-hazardous material, which is selected from polyethylene, natural rubber material, styrene, and silicone. More specifically:
- 9.1 The insulating tube of the cable disclosed in D1 has an inner layer consisting of PTFE and an outer layer comprising PTFE and fillers (see above, paragraph 2.). The insulating tube disclosed in D2 has an inner layer comprising a polyester and an outer layer comprising a fluorinated polymer (page 3, last paragraph). The insulating tube disclosed in D3 has an inner layer comprising a polyamide and an outer layer comprising a fluorinated polymer (pages 2 and 3, bridging paragraph). D4 relates to blends comprising a fluorinated ethylene-propylene copolymer and a fluoroelastomer and discloses a cable having a jacket made of such blends.

*Third auxiliary request - Inventive step*

10. As mentioned in paragraph 9.1 above, none of the cited prior art documents D1 to D4 discloses a cable whose insulating means consists of a core insulating tube which has a single layer consisting of one non-environmentally-hazardous material. Nor is a core insulating tube disclosed in any of these documents consisting of a single one of polyethylene, natural rubber material, styrene, and silicone. Thus, neither the teachings of documents D1 to D4, nor his own general knowledge, taken alone or in combination, would have lead the person skilled in the art to consider a cable comprising the combination of the features which are recited in the characterising part of claim 1 of the third auxiliary request. Moreover, cables including these features have a clear chemical structure. Such a clear structure helps taking preventive environmental measures because the materials or gases which would evaporate in electrical office equipment or be discharged in case of a fire could easily be predicted, and provides an advantageous effect. Hence, in the judgement of the Board, the subject-matter of claim 1 of the third auxiliary request involves an inventive step.
11. For the foregoing reasons, in the Board's judgement, the subject-matter of claim 1 of the third auxiliary request is considered to be new and involve an inventive step within the meaning of Articles 54 and 56 EPC. The application as amended meets the requirements of the EPC.

**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 grant a patent in the following version:  
  
claims: 1 to 4 according to the third auxiliary request, and  
  
description: pages 1 to 6,  
  
all filed in the oral proceedings;  
  
drawings: figures 1 to 5 as originally filed.
3. The obvious clerical error in claim 1 may be corrected (see point 8.1 of the reasons).

The Registrar:

The Chairman:

U. Bultmann

W. J. L. Wheeler