BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

A		B		C	X

File Number: T 792/91 - 3.2.2

Application No.: 84 300 057.1

Publication No.: 0 116 391

Title of invention: Method of environmentally protecting a telecommunications cable splice and kit-of-parts for carrying out the method

Classification: B29C 61/06

D E C I S I O N
of 1 December 1992

Applicant: Raychem Limited

Opponent: 01) kabelmetal electro GmbH
02) Siemens Aktiengesellschaft, Berlin und München

Headword:

EPC Article 56

Keyword: "Inventive step (no) - Skilled person - Selection of materials"

Case Number : T 792/91 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 1 December 1992

Appellant : (Opponent 01)
kabelmetal electro GmbH
Kabelkamp 20
Postfach 2 60
W - 3000 Hannover (DE)

Representative :
Köster
Kabelmetal electro GmbH
Kabelkamp 20
Postfach 2 60
W - 3000 Hannover (DE)

Appellant : (Opponent 02)
Siemens Aktiengesellschaft,
Berlin und München
Postfach 22 16 34
W - 8000 München 22 (DE)

Representative :
Sennefelder
Siemens Aktiengesellschaft,
Berlin und München
Postfach 22 16 34
W - 8000 München 22 (DE)

Respondent : (Proprietor of the patent)
Raychem Limited
Rolls House
7, Rolls Buildings
Fetter Lane
London EC4 1NL (GB)

Representative :
Benson, John Everett
Raychem Limited
Intellectural Property Law Department
Faraday Road
Dorcan
Swindon, Wilts SN3 5HH (GB)

Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 28 August 1991 rejecting the opposition filed against European patent No. 0 116 391 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : G. Szabo
Members : M. Noël
J. Van Moer

Summary of Facts and Submissions

I. European patent No. 0 116 391 was granted on the basis of European patent application No. 84 300 057.1.

II. Oppositions were filed on the grounds of lack of inventive step. These were rejected by the Opposition Division in a decision dated 28 August 1991.

III. Both Opponents lodged an appeal against this decision, the Notices of Appeal being received on 10 October and 21 October 1991, respectively. The appropriate fees were paid and the Statements of Grounds were filed in time.

IV. Main Claims 1 (method) and 19 (device) read as follows:

"1. A method of environmentally protecting a telecommunications cable splice, which comprises:

(a) forming around the splice, a liner having a central region of larger cross-section and end regions of smaller cross-section which provide transitions from the central region to the spliced cables and which locate the liner with respect to the cables;

(b) positioning around the liner a sleeve comprising a heat-recoverable fabric and means for rendering the fabric substantially impervious when the fabric is recovered; and

(c) heating the sleeve thereby causing recovery of the fabric, such that the sleeve engages the cables at each side of the splice;

the means for rendering comprising thermoplastic or elastomeric material as matrix through which fibres of the fabric extend.

19. A kit-of-parts for carrying out a method according to claim 1, which comprises

(a) a liner having a central region of larger cross-section and end regions of smaller cross-section which provide transitions from the central region to the spliced cables and which locate the liner with respect to the cables; and

(b) a sleeve for positioning around the liner which sleeve comprises a heat-recoverable fabric and means for rendering the fabric substantially impervious when the fabric is recovered, the means for rendering comprising thermoplastic or elastomeric material as a matrix through which fibres of the fabric extend."

V. In a communication accompanying the summons to oral proceedings, the Board expressed its doubts as to the patentability of the claims, having regard to the particular relevancy of documents

(6) GB-A-1 431 167, and
(10) US-A-3 058 863

which were already considered in the opposition proceedings.

VI. In the course of the oral proceedings held on 1 December 1992 the Respondent (Proprietor of the patent) submitted essentially the following arguments:

(i) With respect to the disclosure made in document (6) which was to be regarded as the prior art closest to the invention in view of structural similarities and of the use of a tube of heat-shrinkable material therein, the technical problem underlying the present invention was to provide protection for a tele-communications cable splice, which was stronger than the conventional protection in the sense of being capable of high pressure retention without

significant ballooning or creep. This should be achieved with a thickness as small as possible, in addition to the other necessary requirements such as tear and impact strength, split resistance and flexibility.

(ii) However, the skilled person would not have used the laminated heat-shrinkable fabric disclosed in document (10) in lieu of such material, for better protection since the recommended applications of this material were only in the field of packaging articles such as foodstuffs, i.e. a field which was far remote from the widely different specific use of protecting a telecommunications splice surrounded by a shaped liner. There was, therefore, no reason for the skilled person to consider replacing the heat-shrinkable extruded polyethylene tubing material disclosed in document (6) by the shrinkable fabric made available by document (10). In addition, the fabric described therein has a small thickness and would not suitably resist the sever requirements imposed on the claimed article.

VII. The Appellants request that the decision under appeal be set aside and that the European patent be revoked.

The Respondent requests that the appeal be dismissed and that the patent be maintained.

Reasons for the Decision

1. The appeal is admissible.

2. There is no objection under Article 123 EPC since the amendments brought to the patent during the previous

proceedings were not such as to extend the subject-matter beyond the content of the application as filed and the claims in the version as granted were not amended during the opposition proceedings.

3. Closest prior art

The Board regards document (6) as the state of the art closest to the subject-matter of Claim 1, as was also recognised by the parties. Document (6) describes a method and an assembly for environmentally protecting a telecommunications cable splice, comprising a rigid liner 2 having a central region of larger cross-section and end regions of smaller cross-section which provides smooth transitions from the central region to the ends of the spliced cables 8 (cf. page 2, lines 93 to 100 with respect to Figures 6 and 7). The liner is surrounded by a heat shrinkable sleeve 1 coated with a sealing material such that, on shrinking the sleeve down over the splice, the end regions of the sleeve at both sides of the splice engage the cable 8 so as to form a water- and pressure-tight seal. Since the sleeve is able to shrink to a progressively greater degree at the transition regions, a tight seal is provided and, consequently, sliding of the sleeve down the transition can be avoided (cf. page 2, lines 85 to 93).

Preferably, the heat shrinkable sleeve of document (6) comprises a tube of cross-linked polyolefin material but it may be made of any suitable material, for example those described in the citations referred to on page 3, line 24 of document (6), including thermoplastic and/or elastomeric materials having elastic memory characteristics.

As in the patent, the object of document (6) mainly refers to insulating and protecting pressurised telecommunications cable splices which require impermeability as well as other requirements such as mechanical strength and resistance to tension, compression, flexing and impact (cf. page 1, left column).

4. Novelty

4.1 With respect to the embodiments described in document (6), the subject-matter of Claim 1 differs in that the sleeve comprises a heat-recoverable fabric, the fibres of which extend through a matrix made of thermoplastic or elastomeric material for rendering the fabric substantially impervious when it is recovered. Therefore, the structure and the composition of the sleeve material is not known from the closest prior art document.

4.2 The document (10) relates to the fabrication of multi-ply laminated heat shrinkable structures comprising polyethylene film coated fabrics usable more particularly in the field of packaging articles. With the method described therein, film-fabric laminates having at least one ply of film and one ply of fibre material can be prepared. For example, the embodiment of Figure 3 illustrates a three-ply composite structure having a film layer 12 laminated on each side of a fabric layer 13. The film material is made of polyethylene and the fabric fibres are made of polyalkylene materials such as polyethylene or polypropylene. In the composite form, the structure thus has the advantages of both the fibrous fabric and the polyethylene film, that is an increased tear resistance due to the fabric, which is one of the film's deficiencies and imperviousness to gases and

moisture, a property which the fabric itself does not possess (cf. column 4, lines 24 to 31).

The document (10) thus discloses a heat-recoverable fabric material having its fibres embedded in a matrix made of elastomeric material for rendering the fabric impervious after recovering. On the other hand, neither the use of such a fabric as a heat-recoverable sleeve to be wrapped around a liner provided for accommodating a cable splice, nor the specific application to the protection of a telecommunications cable are known from this document.

4.3 Since in none of the other documents revealed in the proceedings are all the features of Claim 1 mentioned in combination, its subject-matter must be regarded as novel over the prior art.

5. Problem and solution

Where pressure retention is a primary design consideration of enclosures for pressurised cable splices, the resistance or mechanical strength of the sleeve material used in document (6) may appear inefficient to retain high pressures. The skilled person could then either increase the wall thickness of the known recoverable polymeric sleeves, which would lead, however, to manufacturing difficulties, or find a stronger material or a more resistant structure, respectively.

With respect to the teaching of document (6) the objective technical problem underlying the present patent is therefore in accordance with the Respondent's definition above (VI(i)) to provide for the sleeve a material having improved protective characteristics, in particular increased tear resistance, while at the same time remaining as thin as possible, in addition to the

maintenance of other mechanical properties already mentioned.

The solution to this problem is given by the remaining features of Claim 1, that is:

- the sleeve comprises a heat-recoverable fabric and means for rendering the fabric substantially impervious when the fabric is recovered; and

- the means for rendering comprises thermoplastic or elastomeric material as matrix through which fibres of the fabric extend.

6. Inventive step

6.1 In document (6) there is no suggestion that an impregnated fabric could be used instead of the polymeric sleeve material used in this document. However, it must be noted that through wordings such as "any suitable material", "for example", "preferably" (cf. page 3, lines 21 to 25), the materials proposed in document (6) are not restricted to the given examples. Thus, there is no prejudice against finding other suitable materials or structures.

6.2 In the Board's view, the person skilled in the art who is looking for a more resistant material, in order to solve his problem as defined above, will necessarily turn to document (10) for the following reasons:

6.2.1 The skilled person is the person qualified to solve the technical problem as objectively set and not merely the person concerned by a possible application of the invention. For if the problem prompts the skilled person to seek its solution in another technical field, the specialist in that field is the person qualified to solve

the problem (T 32/81, OJ EPO 1982, 225, Point 4.2). In the present case the skilled person is a specialist in the technical field of shrinkable materials possessing protective properties which is also the specific field of document (10).

6.2.2 It is specified in column 4, lines 38 to 41 of document (10) that the shrinkable fabrics described therein are generally applicable in the packaging field, in addition to the other uses in construction and protection fields. Packaging is therefore regarded only as a particular field of the more general field of construction or protection of articles in general. The skilled person is admittedly expected to consult also neighbouring fields and the state of the art in a non-specific (general) field dealing with the solution of a general problem which the invention seeks to solve (T 195/84, OJ EPO 1986, 121, Point 8.4). Providing a barrier against penetration by materials from the environment is a simple physical effect independent of the character of the entity inside the barrier. The Board, thus, cannot follow the opinion of the Opposition Division, the conclusions of which were based principally on the fact that in document (10) the specific application of the shrinkable fabric to the protection of a cable splice was not mentioned.

6.2.3 The subject-matter of document (10) deals with the problem of increasing the tear strength of conventional shrinkable polyethylene films while, at the same time, avoiding the known but unwanted solution of merely increasing the thickness and therefore the weight of the shrinkable film (cf. column 1, lines 39 to 43). At the time of filing the patent application, the skilled person was confronted with exactly the same difficulties (cf. patent, page 2, lines 57 to 60). He would have thus inevitably considered

the solution proposed in document (10) of using a more resistant shrinkable composite film-fabric structure.

6.3 As mentioned in section 4.2 above, the shrinkable fabric described in document (10) comprises a polyethylene film laminated with a polyethylene or polypropylene fibres fabric so as to achieve an impervious and more resistant composite structure. These materials are similar to some of the various materials proposed in the patent either for the fabric fibres (cf. page 5, lines 8 to 13) or for the matrix (cf. page 6, lines 15 to 23). The Board is thus satisfied that the composite laminated fabric disclosed in document (10) has the same structure, composition and properties as the claimed matrix impregnated fabric. It is therefore perfectly suitable also for protecting pressurised cable splices.

The Respondent submitted that the fabric disclosed in document (10) was much thinner than that of the patent and, consequently, it could not offer the resistance required. The Board does not share this argument since the thickness given in document (10) (cf. column 2, lines 36 to 60) refers to the film only, that is the impregnation layer of the fabric. As explained above (Point 4.3), the overall strength of the composite structure is given principally by the fabric, not by the film.

Moreover, the above-quoted passage in document (10) indicates that the film thickness should preferably be 1 to about 20 mils (0.025 to 0.254 mm), but films thicker than 20 mils can be used if necessary. The Board cannot see any significant difference when comparing these values with the thickness of the polymeric layer (from 0 to 0.6 mm) forming the matrix in the patented structure (cf. page 6, lines 48 to 51).

6.4 As far as selection of materials is concerned, the Board generally considers it as forming part of the normal activities of the man skilled in the art to select from the materials which are known to him as suitable for a certain purpose the most appropriate one. The replacement of one component with another known one which is better for the purpose is usually an obvious step for the skilled person anxious to improve the appliances and devices (cf. "analogous substitution" in case T 192/82, OJ EPO 1984, 415).

Therefore, the replacement in document (6) of the polymeric material of the sleeve by a fabric embedded in a matrix as proposed by document (10) in order to make use of the known characteristics and advantageous effects provided by the composite structure must be regarded as obvious for the person skilled in the art, especially as the very idea of replacing a film by a more resistant fabric was already the subject of document (10), as explained in Point 6.2.3 above.

6.5 Having regard to the above, the Board comes to the conclusion that the subject-matter of Claim 1 lacks inventive step with respect to the state of the art and therefore does not meet the requirements of Article 56 EPC.

7. The kits-of-parts according to Claim 19 for carrying out the method according to Claim 1 has substantially the same scope since it contains all the technical features recited in Claim 1. Consequently, the same reasoning and conclusions as above apply.

Order

For these reasons, it is decided that:

- **The decision under appeal is set aside.**

- **The patent is revoked.**

The Registrar:

N. Maslin

The Chairman:

G. Szabo

20. 1. 93

11 - 2 - 93