DECISION
of 29 September 1992

Proprietor of the patent: RAYCHEM LIMITED

Opponents: 01) KABELMETAL ELECTRO GMBH
02) SIEMENS AG

Headword:
EPC Article 56

Keyword: "Inventive step (yes, after amendments)"
Case Number: T 387/91 - 3.2.2

DECISION of the Technical Board of Appeal 3.2.2 of 29 September 1992

Appellant 01: KABELMETAL ELECTRO GMBH
(Opponent 01)
Kabelkamp 20
Postfach 2 60
W - 3000 Hannover (DE)

Representative: Köster, Reimer
Kabelkamp 20
Postfach 2 60
W - 3000 Hannover (DE)

Appellant 02: SIEMENS AG Berlin und München
(Opponent 02)
- GR PA 7 -
Postfach 22 16 34
W - 8000 München 22 (DE)

Representative: Sennefelder
SIEMENS AG Berlin und München
- GR PA 7 -
Postfach 22 16 34
W - 8000 München 22 (DE)
Respondent: RAYCHEM LIMITED
(Proprietor of the patent)
Rolls House
7, Rolls Building
Fetter Lane
London EC4 1NL (GB)

Representative: Benson, John Everett
RAYCHEM LIMITED
Intellectual Property Law Department
Faraday Road
Dorcan
Swindon, Wiltshire SN3 5HH (GB)

Decision under appeal: Decision of Opposition Division of the European Patent Office dated 2 May 1991 rejecting the opposition against European patent No. 0 116 392 pursuant to Article 102(2) EPC.

Composition of the Board:
Chairman: G. Szabo
Members: M. Noel
J. Van Moer
Summary of Facts and Submissions

I. European patent No. 0 116 392 was granted on the basis of European patent application No. 84 300 058.9. The oppositions filed by the Appellants 01 and 02 (Opponents 01 and 02 respectively) were rejected by the Opposition Division since the claimed subject-matter was deemed to be novel and based on an inventive step.

II. Both Appellants lodged an appeal against this decision, the notices of appeal being received on 23 May and 24 July 1991, respectively. The appropriate fees were paid and the Statements of Grounds were filed in time.

III. Oral proceedings took place on 29 September 1992 during which the main device claim was amended by the Respondent (Proprietor of the patent).

Main Claims 1 and 17 (article and method of using the same) read as follows (separation of the features added by the Board):

"1. A heat-recoverable wraparound article, the article having a recovery ratio of at least 20%, and edge regions (8) provided with a mechanical closure (3,7,9) for maintaining the edge regions (8) in proximate relationship during recovery;

the mechanical closure including one or more discrete clamping elements which can hold together first and second closure elements at first and second edge regions of the article;

characterized

(a) in that the article comprises a recoverable fabric in which recoverable fibres (6) run from the first edge region (8) to the second edge region (8), and at each said edge region (8) turn back around the closure elements
(7) towards the other edge region (8), thus fixedly trapping the closure elements (7), and individually retaining the fibres in order to prevent unravelling or fraying of the fabric during recovery, and

(b) in that the discrete clamping elements comprise a closure channel of substantially C-shaped cross-section that extends along the edge regions and hold together, and fixedly traps, the first and second closure elements along their length."

"17. A method of enclosing a supply line comprising a telecommunication cable which comprises wrapping round the supply line an article according to any preceding claim, securing the first and second edge regions (8) together, and causing recovery of the fibres."

IV. In the course of the proceedings and in particular at the oral proceedings, the following documents were referred to:

(1) DE-A-2 855 537
(2) DE-A-1 665 147
(4) GB-A-1 155 470
(6) DE-A-3 009 078

V. In support of their written submissions and during the oral proceedings, the Appellants submitted essentially the following arguments:

(i) The document (1) represents the closest prior art as it discloses a heat-recoverable wraparound article having all the features stated in the precharacterising portion of Claim 1. Although not specified in this document, a recovery ratio of at least 20% is, nevertheless, implicitly derivable
from the various applications referred to on pages 7 and 8.

(ii) The document (1) already discloses the principle of the claimed solution, as it is particularly apparent when comparing Figures 3 and 4 of document (1) with Figures 4 and 5 of the patent, respectively. In both cases, the article is made of a recoverable material having edge regions which turn back around closure elements, thus fixedly trapping the same.

To arrive at the subject-matter according to the feature (a) of Claim 1, the skilled person simply needs to replace the sheet of recoverable polymer proposed in document (1) by a suitable heat-recoverable fabric such as the fabric disclosed in document (7), since the latter offers the same properties as those requested in the patent and, in addition, answers the same problem of reinforcing the recoverable material for heavy duty uses and in the same technical fields (protection and construction).

(iii) The feature (b) was introduced in Claim 1 during the oral proceedings but fails to add any inventive subject-matter to Claim 1 since it relates to the closure of the wraparound article, a problem which has nothing to do with reinforcement of the fabric. Moreover, said feature is suggested in document (1) by the very wording of its first claim and by the statement in the second paragraph of page 12.

Further, a closure channel of substantially C-shaped cross-section extending along the edge regions of the article is already known from document (4),
cited on page 8 of document (1) thus complementing the latter by incorporation. Therefore, Claim 1 as amended still lacks inventive step, having regard to the previous combination of documents (1) and (7).

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

The Respondent requests that the patent be maintained on the basis of the version as granted, supplemented by amended claims and description filed at the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. Amendments

The device Claim 1 is based on the combination of originally filed Claims 1, 3 and 6. The features added to Claim 1 at the oral proceedings are fairly supported by the original description, cf. page 16, lines 3 to 6 and page 28, lines 13 to 18 and lines 29 to 34.

As to the feature deleted from the precharacterising portion of Claim 1 in the version as granted ("or the mechanical closure comprising first and second closure elements provided on first and second edge regions respectively, the elements being interengageable by virtue of cooperating surfaces thereof"), the Board observes that the conjunction "or" rendered the feature entirely optional so that it could be rightly deleted with an effective reduction of the extent of protection conferred to the claim.
The method Claim 17 is derivable from original Claims 25, 26 and 27. The remaining dependent claims are also properly supported by the application as filed.

Therefore the Board is satisfied that the amendments brought to the claims and to the description to put it in conformity with the amended claims are not objectionable under the requirements of Article 123(2) and (3) EPC.

3. **Closest prior art**

3.1 In view of the structural similarities, the Board considers document (1) as the state of the art closest to the invention. It discloses all the features of the precharacterising portion of Claim 1. In particular with reference to Figures 1 and 2 of document (1), the heat-recoverable article comprises a heat-recoverable sheet of polymer material having two opposed edge regions 2, 3 provided with a mechanical closure in the form of rigid metal strips 4, 5, for maintaining the edge regions in proximate relationship during recovery. The strips lie generally in the plane of the heat-recoverable sheet material, the edge regions of which overlapping each other in the wraparound configuration (Figure 1b or 2b). Further, the strips have end portions 6, 7 extending beyond the sides of the wraparound assembly, so that the end portions are capable of being engaged with each other and/or with one or more other members (not shown) at/or beyond the sides of the sheet to form fastening means (cf. Claim 1 and page 9, second paragraph). The closure elements 4, 5 of document (1) are thus held together at the edge regions of the article by the clamping elements 6, 7, in conformity with the wording of the present Claim 1.
3.2 The Appellants submitted that since the strips in document (1) are engageable with each other or with one or more other members at the sides of the sheet material, these other members could also be seen as clamping elements having the form of a closure channel extending across the article. The Board cannot follow this view since it is clear from document (1) (cf. page 12, second paragraph) that the one or more further fastening members are to be positioned beyond the sides, i.e. at a distance from the lateral sides of the wraparound sleeve rather than across the width thereof (cf. page 9, end of second paragraph), precisely with the view to avoid the fastening means projecting above the sleeve, so as to provide a substantially flat joint (cf. page 14, first paragraph). A closure channel extending above and along the edge regions is therefore excluded.

3.3 The Appellants further argued that fastening means such as discrete clamping elements or a closure channel member co-operating with suitably shaped protuberances provided at the adjacent overlapping edges of a heat-recoverable sheet were already known from document (4) incorporated to document (1) by reference. This cannot be accepted by the Board since the embodiments described in document (4) represent the background of document (1), the aim of which is just to avoid the unwanted projections of the conventional closure channels.

3.4 The Board agrees, however, with the Appellants’ view (section V(i)) that, although not expressly mentioned in document (1), a recovery ratio of 20% is, as a matter of common general knowledge, disclosed implicitly since this represents a minimum ratio necessarily obtained by a heat-recoverable sheet material to guarantee the article with the desired insulating, sealing or protecting effects. On the other hand, practical recovery ratios much greater
than 20% and preferably in the range of 40% to 75% are recommended in the patent in suit (cf. column 4, lines 23 to 25). However that may be, the objection was not seriously refuted by the Respondent who, even in the examining procedure, admitted a recovery ratio of 20% as implicitly known from document (4), then taken as closest prior art, although this was not expressly mentioned in this document either.

4. Problem and solution

The fastening means disclosed in document (1) are more specifically designed for securing together the two-edge regions of a sheet material forming a sleeve of large diameter in which the size of the completed fastening, which generally protrudes from the surface of the sleeve, has caused spacial problems, especially in cramped locations. High pressure retention problems are not, however, concern of this known embodiment.

With regard to this closest prior art, the technical problem underlying the present patent therefore resides in the provision of a heat-recoverable wraparound article wherein the material provided for the sleeve as well as the arrangement of the associated mechanical closure for maintaining the edge regions in close relationship during recovery of the sleeve material are capable to withstand efficiently relatively high internal pressures, for example in enclosing pressurised telecommunications cable splices, which cannot be reinforced by conventional techniques (cf. patent, column 3, lines 2 to 12).

The solution is given by the features (a) and (b) recited in the characterising portion of Claim 1. Feature (a) refers to the recoverable woven fabric which provides a high internal pressure retention due to its ability to
accommodate hoop stresses, in addition to the recoverable fibres turning their ends round to the closure elements and back into the fabric, so that the latter has inherent in its structure the means for attaching the closure members, while at the same time retaining the fibres thus preventing unravelling of the fabric during recovery.

Feature (b) relates to the closure member including a closure channel for holding together along their length the closure elements which have been previously fixedly trapped within the fabric by the recoverable fibres.

5. **Novelty**

5.1 Document (4), acknowledged in column 2 of the patent, describes a sleeve provided with an integral ridge or protuberance running along each longitudinal edge. The two ridges are held together by a flexible channel of generally C-shaped cross-section to maintain the sleeve in the wrapped-around configuration during and after recovery. Sleeve and ridges are formed as an integral part by moulding or extruding a tubular member having elastic memory properties.

The disclosure made by document (4), however, does not extend beyond that of document (1) since the closure described in the former has no closure element in the sense of the patent, i.e. no elongated reinforcing elements trapped by the edge regions of the sleeve. Further, as in document (1), the sleeve of document (4) is made of a sheet of heat-recoverable polymeric materials. There is no mention of the use of any recoverable fabric.

5.2 Document (6) is an improvement of document (4) which is acknowledged as a starting point in the background section of document (6). In this document strengthening elements 3
are embedded within longitudinally extending beads formed at the edge regions of a shrinkable sleeve and are maintained together by means of a double C-shaped closure channel. Also here the sleeve is produced by extrusion integrally with the embedded strengthening elements, in the form of a tube as shown in Figure 4. However, document (6) does not disclose either the use of a shrinkable fabric material nor the specific closure arrangement, according to the characterising features of Claim 1.

No other document revealed in the procedure so far comes closer than these above-cited documents. The subject-matter of Claim 1 is therefore novel over the prior art.

6. **Inventive step**

6.1 Heat shrinkable tubular fabric articles have been known to the skilled person for a long time, and some of them are mentioned on pages 4 and 5 of the application as filed. It is also known from document (2) to wrap on the article to be insulated a fabric having heat-shrinkable characteristics. In the case of a woven fabric, this may be woven entirely from filamentary heat-shrinkable plastics materials, such as polymeric materials, or from heat-recoverable filaments together with reinforcing filaments which are, however, not heat-recoverable, to produce recovery in only one direction.

Still another heat-recoverable fabric material is known from document (7). Here, the woven or knitted fabric is made of stretched polyalkylene fibres having recoverable properties, i.e. under the strain release temperature, and the stretched fibres will relax and return to their original extruded unstretched dimensions, according to the recovery ratios indicated in the table of column 6.
6.2 The skilled person faced with the problem set in Point 4 above and being aware of document (7) could hit upon the idea of replacing the sheet material disclosed in document (1) by the fabric material proposed in document (7), since the latter has suitable mechanical properties such as increased tear resistance and tensile strength and thus is capable to withstand efficiently relatively high internal pressures occurring within the wrapped article, as required in the patent. All the more, as the fabric of document (7), in addition to the specific uses in the shrink packaging field, is also recommended for heavy duty uses in the construction and protection fields. For the Board, these fields indisputably include the neighbouring field of environmental protection of elongated substrates such as splices in telecommunication cables, as contemplated in the patent.

However, even if the person skilled in the art were to consider combining together the teachings of documents (1) and (7), he would not necessarily arrive at the subject-matter of Claim 1. Essentially, document (7) is confined to the use of a heat-recoverable fabric material, preferably in the composite form of a multi-ply laminated structure. The basic principle of trapping closure elements between the fabric fibres at the edge regions of the sleeve is neither disclosed nor suggested in document (7), nor in any other citation whatsoever.

6.3 The Appellants submitted (section V(ii)) that the transfer of the recoverable fabric material of document (7) in lieu of the recoverable sheet material used in the configurations according to Figures 3 and 4 of document (1) would immediately result in the patented article illustrated by respective Figures 4 and 5 according to which a continuous heat-recoverable fabric provides closed
loops within its cross-section in order to accommodate rigid rods or other elongate closure elements.

The Board cannot follow this line of argument. Although the respective embodiments mentioned above are similar in structure, they do not form, however, the subject-matter of the present Claim 1 but that of the additional features of Claims 5 and 6 respectively. Consequently the Appellant’s assertion that document (1) discloses the solution of principle set forth in Claim 1 is incorrect. Rather, according to Claim 1, the subject-matter of which is illustrated by Figure 2 in the patent, only the recoverable (weft) fibres of the fabric which are directed perpendicularly to the elongated rods and are provided with loops for inserting said rods. After having run between the opposite edge regions of the article, the fibres then turn back around the closure elements so that the fabric is woven integrally with the closure elements trapped in the recoverable fibres. As stressed in the patent itself (cf. column 12, lines 20 to 21) this sort of fabric thus has inherent in its structure the means for attaching the closure member (C-shaped channel). Therefore this arrangement also provides for individually retaining the recoverable fibres at the edge regions thus efficiently preventing unravelling or fraying of the fabric during recovery. This is regarded by the Board as particularly advantageous.

6.4 Also a hypothetic combination of the prior art documents (6) and (7) would not lead any more closer to the subject-matter of Claim 1. At the very best, Figure 2 of document (6) could only suggest to the skilled person, having in mind the recoverable fabric known from document (7), that reinforcing elongate elements can be trapped into loops provided by the fabric itself, rather than just the
6.5 From the foregoing, the Board has come to the conclusion that by the insertion of the closure elements internal to the recoverable fabric fibres according to feature (a) of Claim 1 in combination with the reinforcing effect of the closure channel firmly retaining together the closure elements along their length according to feature (b), a highly resistant sheet-recoverable wraparound article is achieved, which is capable of withstanding, as a whole, relatively high internal pressures.

In the Board's view, such a combination of features which is neither described nor suggested by the state of the art involves an inventive step within the meaning of Article 56 EPC.

6.6 Since Claim 1 is allowable, the dependent Claims 2 to 16, which relate to further embodiments of the invention, are also allowable.

6.7 The method of Claim 17 uses the heat-recoverable wraparound article according to Claim 1 to enclose the supply line of a telecommunication cable. It therefore also meets the requirements of novelty and inventive step as required by 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 maintain the patent on the basis of the amended claims and description filed at the oral proceedings, as specified in point VI above.

The Registrar:  

S. Fabiani

The Chairman:

G. Szabo

9. 12. 92