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D E C I S I O N
of 18 February 1998

Case Number: T 0980/95 - 3.3.3
Application Number: 85308150.3
Publication Number: 0181233
IPC: B05D 1/36
Language of the proceedings: EN

Title of invention:
Protecting substrates

Patentee:
Raychem Corporation (a Delaware corporation)

Opponent:
Shaw Industries, Ltd.
Ube Industries, Ltd.

Headword:
-

Relevant legal provisions:
EPC Art. 114(2), 56, 84
EPC R. 29(1)(a)

Keyword:
"Clarity (yes)"
"Insufficiency - not pleaded during opposition - inadmissible"
"Inventive step (yes); relevant problem not derivable from
cited art"

Decisions cited:
G 0002/88, T 0013/84, T 0435/91, T 0686/91, T 1002/92,
T 0039/93, T 0325/93, T 0410/93

Catchword:
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Boards of Appeal

Chambres de recours

Case Number: T 0980/95 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 18 February 1998

Appellant I:
(Opponent I)

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Respondent:
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Decision under appeal:

Interlocutory decision of the Opposition Division
of the European Patent Office dated 5 September
1995, issued in writing on 17 October 1995
concerning maintenance of European patent
No. 0 181 233 in amended form.

Composition of the Board:

Chairman: C. Gérardin
Members: R. J. Young
J. A. Stephens-Ofner

Summary of Facts and Submissions

- I. The mention of the grant of European patent No. 0 181 233, in respect of European patent application No. 85 308 150.3, filed on 8 November 1985 and claiming US priorities of 9 November 1984 (US 670245) and 15 February 1985 (US 702116) was announced on 13 January 1993 (Bulletin 93/02).
- II. Two Notices of Opposition were filed, respectively on 12 October 1993, by Shaw Industries Ltd., (Opponent I), on the grounds of lack of novelty and lack of inventive step, and on 13 October 1993, by Ube Industries, Ltd., (Opponent II), on the ground of lack of inventive step only. The oppositions were supported inter alia by the documents:
- E2: DE-C-1 965 802;
E6: GB-A-1 427 260 and its German language equivalent
E6*: DE-A-2 222 911;
E8: JP-54-5432 (Japanese Examined Patent publication), considered in the form of its English translation;
and
E15: JP-59-62373 (Japanese Unexamined Patent application), considered in the form of its English translation.
- III. By a decision dated 5 September 1995 and issued in writing on 17 October 1995, the Opposition Division found that the patent could be maintained in amended form, on the basis of a set of Claims 1 to 11 filed on 5 September 1995. Independent Claim 1 of this set reads as follows:

"A method of applying a protective covering to a substrate which comprises:

- (a) applying to the substrate a curable polymeric composition which is liquid at 20°C, is curable to a substantial extent within 24 hours at a temperature of not more than 80°C and comprises:
 - (i) a resin component which is liquid at 20°C; and
 - (ii) a curing agent;

- (b) applying a polymeric article comprising at least two layers, the innermost layer of which being a hot melt adhesive capable of interacting with said curable composition onto the substrate to cover the curable polymeric composition before the curable composition is cured to a substantial extent,

- (c) maintaining the hot melt adhesive in intimate contact with the curable composition while the curable composition is curing, and

- (d) allowing the curable composition to cure;

characterised in that:

- (i) the polymeric article is a heat recoverable article, and the step of applying the polymeric article is effected by applying heat to the heat recoverable article to shrink the article, thereby bringing the hot melt adhesive into intimate contact with the curable composition; and

- (ii) the hot melt adhesive reacting with the curable composition as it cures from its substantially uncured state, so that chemical bonds are formed between the curable composition and the hot melt adhesive layer."

Claims 2 to 11 are dependent claims directed to elaborations of the method according to Claim 1.

According to the decision, the closest state of the art was document E15, which disclosed a method of applying a protective covering to a substrate according to the preamble of Claim 1. The technical problem was to find another method for applying such a covering, with a good or better compound between substrate and layer. The distinguishing features were (i) the use of a heat shrinkable article, the innermost, hot melt layer of which came into intimate contact with the curable composition, and (ii) the formation of chemical bonds between the former and the latter. None of the cited documents, however, contained a clear statement disclosing such chemical bonds. Thus, the subject-matter of Claim 1 could not be obtained by a combination with the other documents. It therefore involved an inventive step.

IV. Two Notices of Appeal were filed against the above decision, respectively on 12 December 1995 by Opponent I (Appellant I) and on 14 December 1995 by Opponent II (Appellant II).

IV.1 Appellant I argued, in the Statement of Grounds of Appeal, filed on 23 February 1996, in essence as follows:

- (a) It had to be questioned whether the claimed subject-matter was sufficiently described, since the requirement in Claim 1 for chemical bond formation corresponded to a definition by result which was neither clear nor predictable, and little or no guidance had been given in the description. In any case, the Claim 1 did not meet the requirements of Article 84 EPC.

- (b) The measure relied upon, of curing the curable composition in intimate contact with the hot melt adhesive (feature (ii)), was known from E15, so it was at least equally probable that the prior art achieved a chemical bond. Furthermore, the use of heat recoverable articles (feature (i)) had been known since about 1958 and there could be no inventive step in simply modifying E15 to include the use of such an article.
- (c) The skilled person would furthermore have expected, from his general knowledge, a chemical reaction to take place if certain chemical groups were present in the adhesives. Such combinations were known, for instance, from E6 or E2.
- (d) In short, either the prior art disclosed all the steps of Claim 1, or, if it did not, no guidance had been given in the specification as to the nature of the further step required.

A new document, E17: US-A-4 048 355 was cited for the first time in connection with point (d), above.

IV.2 Appellant II submitted, with the Statement of Grounds of Appeal, filed on 15 February 1996, an experimental report ("Experimental Report"), and, in a subsequent submission received on 22 April 1996, a further experimental report ("Experimental Report II"). Finally, on 16 January 1998, a still further experimental report ("Experimental Report III") was filed. These reports were intended to show that chemical bonds according to feature (ii) of Claim 1 were formed when operating according to Example 7 of E15. It was furthermore argued, that the remaining

distinguishing feature (i), the use of a heat recoverable article, was a successful technique known, for instance, from E8. Thus the subject-matter of Claim 1 was obvious.

V. The Respondent (Patentee) disagreed, in a submission filed on 6 December 1996, with the objections of the Appellants. The submission was accompanied by an experimental report (Report of Mr. Rinde) to show that no chemical bonds were formed according to the relevant disclosures of E15 and E6, but that such bonds were obtained when carrying out the teaching of the patent in suit. The Respondent argued, in essence as follows:

- (a) There was no lack of clarity, since there was sufficient information in description, including a number of examples, to enable the skilled person to select a combination of curable composition and hot melt adhesive to achieve the required chemical bonds. Furthermore, it was perfectly testable whether or not a chemical bond was formed.
- (b) It was denied, on the basis of spectral data in the Report of Mr. Rinde, that chemical bonds were formed according to E15. In addition, the first two experimental reports of Appellant II were flawed in a number of respects. Hence, the presence of chemical bonds according to the patent in suit provided a distinction over the relevant disclosure of E15.
- (c) On the issue of inventive step, the question of why E15 should not be modified to use a heat recoverable article did not arise. The correct question was rather, "would the person skilled in the art have considered the claimed method in the expectation of some improvement or advantage?". There was, however, nothing in the prior art to

suggest such an improvement or advantage. It was a real benefit of the claimed method that good peel strengths were obtainable even in situations where it was not practicable, or not possible, to preheat the pipe substrates to high temperatures.

- VI. Oral proceedings were held before the Board on 18 February 1998. At the oral proceedings, issues relating to the clarity and two-part form of Claim 1 were discussed, in addition to the issues already submitted in writing.
- VII. Appellants I and II both requested that the decision under appeal be set aside and the patent be revoked in its entirety.

The Respondent requested that the appeals be dismissed.

Reasons for the Decision

1. The appeals are admissible.
2. *Late-filed submissions*
 - 2.1 The questioning, by Appellant I, of whether the claimed subject-matter had been sufficiently described (section IV.1, above), although admittedly without explicit reference to Article 100(b) or Article 83 EPC, was a fresh argument directed to a hitherto unpleaded ground of opposition. Such a new ground of opposition may not be admitted in appeal proceedings, except with the consent of the Patentee, in this case

the Respondent (G 0010/91, OJ EPO 1993, 420). The Respondent was not, however, prepared, at the oral proceedings, to consent to the introduction of such a ground. Accordingly, it was not admitted to the appeal proceedings.

- 2.2 Of the documents E1 to E16 listed by Appellant II in its Statement of Grounds of Appeal and referred to as "Prior art to be considered", documents E4, E11, E12, E13, E14 and E16 had been disregarded by the Opposition Division. The Board sees no reason to differ from this viewpoint, and, consequently, these documents were not admitted into the proceedings.
- 2.3 The disclosure of Document E17, referred to in the Statement of Grounds of Appeal of Appellant I for the first time, goes beyond the factual framework of the proceedings thus far. Furthermore, whilst the Respondent has provided comments on this document (submission filed on 6 December 1996, page 8, etc.), nevertheless its contents did not seem *prima facie* so highly relevant that it is **highly likely to prejudice the maintenance of the European patent in suit** (T 0039/93, OJ EPO 1997, 134, Reasons for the decision point 3.1.2, referring to T 1002/92, OJ EPO 1995, 605). Consequently, the Board decided to exclude it from consideration under Article 114(2) EPC.
- 2.4 Although the last of the three experimental reports submitted by Appellant II ("Experimental Report III") was filed on 16 January 1998, i.e. just over one month before the date set for the present oral proceedings, it was incomplete on the date it was filed, since FT-IR spectra were missing. These were not supplied until 30 January 1998, i.e. less than three weeks before the oral proceedings. Whilst Experimental Report III was an attempt to meet objections raised by the Respondent

to the first two Experimental Reports, and in this sense did not go beyond the framework of the proceedings, nevertheless the Respondent had clearly had no opportunity to repeat the modified experiments therein. Furthermore, the Respondent contested the introduction of the report on the basis of its lateness. Consequently, the Board decided, on the grounds of equity, to exclude Experimental Report III from consideration under Article 114(2) EPC.

3. *Amendments*

No objections were raised by the parties under Article 123(2) or 123(3) EPC to the text of the patent in suit on which the decision under appeal was based, and which underlies the present decision. Neither does the Board see any such objection to this version.

4. *Clarity of Claim 1*

4.1 The first area of dispute in relation to the clarity of Claim 1 relates to the means provided for formation of chemical bonds between the curable composition and the hot melt adhesive layer (feature (ii)).

4.1.1 It is evident that the requirement for the formation of chemical bonds is a functional limitation, since it is the required result of carrying out the claimed method. This does not, however, in itself, imply a lack of clarity. Consequently, the objection of Appellant I that it is a definition by result is to this extent not well founded (section IV(a), above).

4.1.2 The further aspect of the objection, that the definition was "neither clear nor predictable", was based on the criticism that the claim contained no instructions as to what "extra" one would have to do

to achieve a chemical, as opposed to a physical bond. In particular, the use of a heat recoverable article (feature (i)) would not itself be sufficient to produce a chemical bond if only a physical bond would otherwise have been formed; and furthermore there was no criterion in the claim for any more specific measure to be carried out, such as, for instance, the additional selection of the materials used for the formation of chemical bonds (feature (ii)).

4.1.2.1 With regard to feature (i), no evidence, or other reason was put forward to show why the use of a heat recoverable (heat shrinkable) article could not achieve a particular effect, such as the formation of a chemical bond, within the context of the claimed combination. On the contrary, according to the submission of the Respondent at the oral proceedings, which was uncontested in this respect, it is during the shrinkage that the heat of reaction necessary to form the chemical bonds is provided. Even if this had not been the case, however, and the position adopted by the Appellant had been plausible, it would not imply any lack of clarity in the definition of the feature itself. On the contrary, the use of a heat recoverable article would appear to the Board to be a very clear feature indeed.

4.1.2.2 As regards feature (ii), such further instructions or measures would only be necessary in the claim, if the functional form of the limitation were for some reason not justified in itself. Such an issue is not one of clarity, however, or even of support, but of sufficiency (decision T 0435/91, OJ EPO 1995, 188; Reasons for the decision, points 2.2.1 to 2.2.3). The ground of opposition of lack of sufficiency (Article 100(b) EPC) does not, however, form part of the proceedings (section 2.1, above).

- 4.1.3 Consequently, the objection raised is irrelevant, in both its aspects, to the issue of clarity, and no deficiency under Article 84 EPC can be recognised.
- 4.2 The second area of dispute centred on the allegation that that the term "chemical bonds" was too vague. This was based on the notion that the skilled person, performing the method claimed, would not have any sure means of detecting whether or not chemical bonds had been formed.
- 4.2.1 The conviction carried by this argument is reduced by the fact that both Appellant I and the Respondent relied on a large number of FT-IR spectra as evidence of the existence of chemical bonds. Thus, these parties were evidently of the opinion that, if chemical bonds had been formed according to the terms of Claim 1 of the patent in suit, they would inevitably be detectable by a suitable such spectral technique.
- 4.2.2 Whilst there were some differences of opinion on the details of the spectra, such as their quality in terms of signal-to-noise ratio, the way in which they had been presented (difference spectra), and the interpretation of the peaks, none of these was of a tendency to question the principle of using such spectra as a means of establishing the presence or absence of chemical bonds. Consequently, the objection of Appellant I, which relied on such differences, cannot be regarded as establishing a credible doubt that the skilled person would be able unambiguously to ascertain the presence or absence of chemical bonds.

4.2.3 The further argument of Appellant I, at the oral proceedings, that the skilled person practising the claimed method "in the field" would not have such a spectrometer available is irrelevant, since a sample taken from a coated pipe could always be transported to a laboratory for testing.

4.2.4 Consequently, no justification has been established for the view that the term "chemical bonds" in Claim 1 is vague in itself, or otherwise lacking in clarity.

4.3 The third, and final admissible area of dispute regarding the clarity (Article 84 EPC) of Claim 1 relates to an alleged indeterminacy in the term "substantially uncured state", referring to the curable composition. According to Appellant I at the oral proceedings, whereas the term "curable to a substantial extent", also appearing in Claim 1, had been formally defined, in the description (page 3, lines 36 to 38), as meaning "cured to at least about 50%, preferably at least about 65%, most preferably at least about 80%, of its fully cured state", the term "substantially uncured state" had not been defined at all.

4.3.1 In the Board's view, the definition of the "substantially uncured state" follows from the definition of the curable composition itself in feature (a) in Claim 1.

Evidently, once the resin component (i) and the curing agent (ii) have been brought together to form the "curable polymeric composition", the latter will commence curing from what, in the Board's view, can only be defined as a "substantially uncured state".

Consequently, there is no immediate need for a formal definition of the latter term.

4.3.2 The argument of Appellant I at the oral proceedings in this connection, that "cured to a substantial extent" and "substantially uncured" could not be contiguous terms, does not form the basis of a convincing objection, because there is no reason to assume they would be contiguous in the first place.

4.3.2.1 On the contrary, the requirement of step (a), that the curable composition is a liquid at 20°C already establishes a distinguishing criterion, since, as explained by the Respondent at the oral proceedings, in the relevant case under discussion, where the curable composition is an epoxy primer, this would have cured to a gel state - in which it would no longer be liquid - at an extent of curing of about 40%, i.e. well below the lowest threshold defined for "cured to a substantial extent".

4.3.2.2 Thus the "substantially uncured state" is in practice distinguished from the state of being "cured to a substantial extent" by the intervening requirement of the curable composition being a liquid at 20°C when it is applied to the substrate.

4.3.2.3 Consequently, there is no danger of confusion of the two states of curing referred to, or, therefore, any need for a formal definition of the term "substantially uncured state" in Claim 1.

4.4 Nor is any other lack of clarity apparent to the Board in the wording of the claims. Consequently, the claims are held to be clear in the sense of Article 84 EPC.

5. *Two-part form of Claim 1*

5.1 An argument of Appellant II, submitted for the first time at the oral proceedings before the Board, that Claim 1 was not in the correct two-part form prescribed by Rule 29(1)(a) EPC, was based on an allegation, that the closest state of the art had been acknowledged in the description at page 2, lines 47 to 50 of the patent in suit, in view of a later written submission of the Respondent, according to which "We freely admit that heat shrinkable articles coated with hot melt adhesive linings are well known for use in covering pipelines". This statement, which allegedly corresponded to the above acknowledgment, represented a more pertinent state of the art than E15 (submission of 6 December 1996, page 13, point 6).

5.2 It is clear from the decision under appeal that E15 was considered to be the closest state of the art during the opposition proceedings (Reasons, point 5). Furthermore, it is clear from the Minutes of the oral proceedings, held before the Opposition Division, that the precharacterising portion of Claim 1 contained all the features known from E15 (Minutes, point 33). In particular, the requirements of Rule 29(1)(a) EPC were, by common consent, fulfilled at this point.

5.3 The new "closest state of the art" canvassed by Appellant II consists only of a single sentence, no corresponding source document being referred to, or even having been identified by Appellant II. Thus, this acknowledgment has not been shown to correspond to a well-defined state of the art which would enable a correct apportionment of features in the two-part form, let alone to a "closest state of the art", in the normal sense of the term.

- 5.4 The further written submission of the Respondent, relied upon in this connection, merely acknowledges that a corresponding combination of features was known. It does not, in the Board's view, itself add anything to the pertinence of the prior art acknowledged, let alone establish it as the "closest state of the art".
- 5.5 Even if it had, however, there is no explicit requirement in Rule 29(1)(a) EPC that the two-part form be set up on the basis of a "closest" prior art, since the rule makes no reference to the necessity or desirability that the characterising portion of the claim should fairly set out the inventive step. In this connection, another Board has ruled that a claim in two-part form must be regarded as appropriate, if a clearly defined state of the art exists from which the claimed subject-matter distinguishes itself by further technical features. In particular, it cannot be accepted as a general rule that the item of prior art used for the preamble of the claim should be concerned with the same problem as the invention (T 0013/84, OJ EPO 1986, 253). Consequently, the mere fact that a particular state of the art turns out, in later proceedings, not to be the "closest" state of the art for the assessment of inventive step does not in itself result in a two-part form based on that art contravening Rule 29(1)(a) EPC.
- 5.6 Consequently, and whether or not the acknowledged state of the art corresponds to a "closest state of the art", there is no lack of compliance with Rule 29(1)(a) EPC, and, in particular, no necessity to re-draft the two-part form of Claim 1.

6. *Novelty*

Lack of novelty in the subject-matter claimed in the patent in suit was no longer alleged in the appeal. Nor does the Board see any reason to question the novelty of the claimed subject-matter. Consequently, the subject-matter of Claims 1 to 11 is held to be novel.

7. *Inventive step*

In the light of the above, the only remaining issue to be decided is whether the subject-matter of Claims 1 to 11 involves an inventive step in the sense of Article 56 EPC.

7.1 The patent in suit is concerned with a method for applying a protective coating to a substrate, in particular a metallic pipe (page 2, lines 3, 4). The method comprises four steps (a) to (d) as set out in the preamble to Claim 1 (section III., above). Such a method is, however, known from E15, which was considered, according to the decision under appeal, to be the closest state of the art.

7.1.1 According to E15, the method is characterised by using, as the epoxy resin primer, a composition containing a polyepoxy compound comprising the following components (A) and (B) and an amine curing agent:

(A) diglycidyl ether of bisphenol F having an epoxy equivalent of 160 - 190,

(B) diglycidyl ether of bisphenol A having an epoxy equivalent of 400 - 3 500, in an amount of 5 - 100 %wt of component (A) (Claim 1).

7.1.2 The method enables the long cooling times which are necessary, especially in the case of a thick pipe, to avoid vulnerability during further handling steps to be reduced, and an adequate bond strength to be achieved, by pre-heating the pipe only to a temperature below the melting point, or even below the softening point (generally a temperature of about 10°C lower than the melting point), instead of to a temperature higher than the melting point, of the modified polyolefin (page 3, second complete paragraph, and page 5, second paragraph).

For example, in modified polyolefins having a melting point of about 122° to 125°C, the pre-heating temperature may be 120°C or less, preferably 95 to 115°C. When an anhydrous maleic acid grafted polypropylene having a melting point of 164° to 167°C is used, the preheating temperature is 161°C or less, preferably 145 to 155°C (page 12, second complete paragraph).

7.1.3 The fusion-bonding of a coating of a primer can be effected, after pre-heating the metal to a desired temperature, according to the following methods:

- (i) by extruding a modified polyolefin sheet or a co-extruded sheet of a modified polyolefin and an unmodified polyolefin to form a laminate;
- (ii) by placing such a sheet or laminate on the metal surface, followed by contact-bonding by means of a heating roll or heating press;
- (iii) by powder-coating a modified polyolefin on the coated surface of a primer provided on the external surface of the metal, or powder coating an unmodified polyolefin on the metal surface,

whereby, in the case of method (iii), the metal is required to be pre-heated to a temperature of 15°C higher than the melting point of the unmodified polyolefin (page 11, second and third complete paragraphs).

The pre-heating can be effected at a higher temperature than the melting point of the modified polyolefin, which is, however, undesirable in view of the cooling cycle (page 12, third complete paragraph).

- 7.1.4 According to Example 1, the external surface of a sandblasted steel pipe is roll coated with an epoxy primer followed by heating at 130°C for 30 minutes to cure the primer.

After cooling the pipe to 100°C, a laminated sheet comprising an anhydrous maleic acid-grafted polyethylene and a low density polyethylene is extruded on the primer coating by means of a coextrusion die at 160°C so that the modified polyethylene is contacted with the coating to cause a lamination. The resin-coated pipe is introduced into a water tank so that the resin temperature is 80°C or less (passage bridging pages 13, 14).

- 7.1.5 According to Example 7, a resin-coated steel pipe is obtained in the same manner as in Example 1 except that the heating conditions of a primer after coating a steel plate were changed to 80°C for 30 min (semi-curing) (page 16). The peel strengths are shown in Table 1 (page 17). In particular, the peel strength, measured at 23°C, of a steel plate preheated to 80°C is in all cases zero (Table 1, page 17).

- 7.2 It was not disputed that there is no disclosure, in E15, of the use of a heat recoverable article. Consequently, E15 does not disclose, in the sense of Article 54(2) EPC, characterising feature (i) of Claim 1 of the patent in suit.
- 7.3 The issue of whether E15 disclosed the formation of chemical bonds (feature (ii) of Claim 1 of the patent in suit) was, however, a matter of dispute.
- 7.3.1 There is no explicit mention of the formation of such bonds in E15.
- 7.3.2 The argument of Appellant II, that such bonds were inherently formed when operating the process according to Example 7 of E15, was accompanied by experimental data intended to demonstrate the formation of such bonds (section IV, above).
- 7.3.3 Quite apart from the fact that the validity of these data was contested by the Respondent, whose own experimental report was intended to prove the opposite (section V., above), the Board takes the view that the provision of such data in relation to E15 is irrelevant. The relevant question is not whether chemical bonds are **in fact** formed when operating according to E15, but whether the disclosure of E15 makes such bond formation available to the skilled reader (G 0002/88, OJ EPO 1990, 093).
- 7.3.4 According to the latter decision, "In the case of a 'written description' which is open for inspection, what is made available in particular is the information content of the description." Further according to the decision, "In each such case,

however, a line must be drawn between what is in fact made available, and what remains hidden or otherwise has not been made available" (Reasons for the decision, point 10).

7.3.5 There is, in this connection, nothing in E15 to reveal to the skilled person the fact of the formation of such bonds. In particular, the nature of the bonding between the epoxy resin primer and the modified polyolefin in E15 is defined in Claim 1 as "fusion-bonding". This was interpreted in the decision under appeal, however, as being a clear statement of an adhesive bonding, i.e. a physical bond (Reasons for the decision, point 8).

7.3.5.1 This interpretation, which is crucial to the outcome of the appeal, reflects the state of general knowledge, at the relevant filing date of the patent in suit, of the phenomenon of interfacial adhesion, which had not been shown to propose any mechanism which depended on the formation of chemical bonds. On the contrary, to the Board's knowledge, there was no such theory, generally known at the relevant date, which proposed mechanisms of adhesion which were other than essentially physical in character.

7.3.5.2 Nor was any evidence, or even argument submitted in the appeal to support the view that such a chemical mechanism of adhesion might have belonged to the general knowledge of the skilled person at the relevant date. Yet the onus of proof was on the Appellant(s) to do this.

- 7.3.5.3 The argument of Appellant II, that the term "fusion bonding" did not exclude the possibility of components reacting together during liquefying or melting (Statement of Grounds of Appeal, page 8) is beside the point, since mere breadth of scope does not add to the relevant information content.
- 7.3.5.4 Nor is the Board aware of any other reason why the skilled person reading E15 would have derived, from the term "fusion bonding", the concept of chemical bonds being set up across the fusion bonded interface.
- 7.3.5.5 The argument of Appellant I, that the skilled person would have expected formation of chemical bonds from textbook descriptions of the properties of the reactive groups present in the hot melt adhesive and curable compositions respectively, is not convincing, since such descriptions assume that reaction has already taken place. A realisation that an effect of the claimed features is the formation of such bonds as a measure of adhesion depends, however, upon knowledge which is neither to be found in such textbooks nor, for the reasons given, as part of the general knowledge of the skilled person.
- 7.3.5.6 Consequently, the interpretation of the term "fusion bonding", in the decision under appeal was correct, and the formation of chemical bonds as a measure of adhesion, if it occurred at all in E15, was hidden from the skilled reader.
- 7.3.5.7 Hence, the disclosure of E15 does not make the formation of chemical bonds available to the skilled person. In other words, feature (ii) of Claim 1 is not disclosed, in the sense of Article 54(2) EPC, in E15.

- 7.4 In summary, the measures characterising the method provided according to Claim 1 of the patent in suit differ from those disclosed in E15 by features (i) and (ii).
- 7.5 Quite apart from the above differences, the method according to the patent in suit is stated to be concerned with the application of pipeline coatings "in the field", or protection of other substrates such as cable splices, which require more moderate temperatures and portable equipment, rather than with prior techniques requiring high temperatures and complex equipment, which are limited to factory application of the coating or are otherwise impracticable under field conditions (page 2, lines 44 to 47). In particular, the substrate may act as a heat sink and prevent the interface between the adhesive and the pipe from attaining the minimum bond line temperature required to form a strong bond. One such situation is an oil-carrying pipeline in which the oil is between 25 and 50°C, under which conditions it is difficult to retrofit or repair a pipeline coating with a heat recoverable article (page 2, lines 53 to 57).
- 7.6 As mentioned above (section 7.1.2), however, the disclosure of E15 is concerned with reducing cooling times of pipes which have been pre-heated to a temperature in the region of the softening point of the coating material, which is high enough to hinder efficient handling and transportation of the finished products (page 3, second complete paragraph). Hence, E15 is evidently an example of precisely such a high temperature technique as is contrastingly referred to in the patent in suit.

7.7 It thus follows that the two methods approach their respective problems from opposite ends of the temperature scale. In the Board's view, the skilled person, wishing to solve a problem of an environment which is too cold, will not turn, as his starting point, to a method adapted for an environment which is too hot. In other words, the aims of the two methods are diametrically opposed to one another. In particular, from the point of view of the derivation of a technical problem, they have essentially nothing in common.

7.8 Such a situation has been recognised and adjudicated by another Board in decision T 0686/91 of 30 June 1994 (not published in OJ EPO).

In that decision, the Board observed that, in the determination of the closest state of the art, ex post facto considerations should be avoided. Therefore, a document not mentioning a technical problem that is at least related to that derivable from the patent specification, did not normally qualify as a description of the closest state of the art on the basis of which the inventive step was to be assessed, regardless of the number of technical features it might have in common with the subject-matter of the patent concerned (Reasons for the Decision, point 4).

7.8.1 In the present case, not only does the problem addressed by the patent in suit diverge from that of E15, but the solution differs in at least two essential points, namely features (i) and (ii) of Claim 1.

- 7.8.2 Whilst this does not imply any incorrectness in the formulation of the two-part form (section 5, etc., above), it does, in the Board's view, indicate that the relevance of the disclosure of E15 has been generally overrated in the proceedings so far, on the basis of a superficial similarity of some of the method steps and a hindsight analysis.
- 7.9 Such a state of the art, taken on its own, in which neither the problem nor the solution is closely oriented to the claimed subject-matter, can neither point in the relevant direction (problem), nor, *a fortiori*, provide an obvious route to a relevant differing solution (T 0410/93 of 16 July 1996, not published in OJ EPO; Reasons for the decision, point 3.6.8)
- 7.10 It is thus a consequence of the choice of E15 as the starting point in the state of the art, that the claimed subject-matter is non-obvious with respect to such art, since any attempt by the skilled person to establish a chain of considerations leading in an obvious way to the claimed subject-matter gets stuck at the start, for lack of an identifiable relevant problem (T 0325/93 of 11 September 1997, not published in OJ EPO; Reasons for the decision, point 6.1).
- 7.11 Nor would the skilled person be led to combine with E15 a prior art disclosure more directly relating to the relevant problem than that of E15, since, in view of the above, the relevance of such a disclosure would not be apparent to the skilled person.

7.12 In the light of the latter finding, the argument of Appellant I, that heat recoverable articles had been used in the art since 1958, and that of Appellant II that such a technique was disclosed in E8, are beside the point.

The relevant question for the assessment of inventive step is not "could the skilled person have used a particular measure", but "would he have done so in the expectation of some improvement or advantage".

According to the uncontested submission of Appellant I at the oral proceedings, however, the use of such heat-recoverable articles is particularly associated with coating pipelines "in the field" (patent in suit, page 2, lines 44 to 49). The aim of the method according to E15 does not, however, have anything in common with such a method (section 7.7, above).

Consequently, no incentive to make such a modification is evident from the disclosure of E15.

7.13 Finally, whilst three different methods of applying the "fusion bonding" layer are described in E15 (section 7.1.3, above), only one of them involves the application of a two-layer laminate, and this is not heat-recoverable. Consequently, there is no "one-way street" leading to the use of a heat recoverable article in any case.

7.14 In summary, the subject-matter of Claim 1 of the patent in suit does not arise in an obvious way, starting from E15.

7.15 Nor would the result be different if one were to have started, as canvassed by Appellant II at the oral proceedings, from the acknowledgment of state of the art in the patent in suit, for the following reasons.

- 7.15.1 The acknowledgment of prior art in the description of the patent in suit (section 5.1, above) was not supported by reference to any specific source disclosure which could be described as a "well-defined state of the art" (section 5.3, above). Consequently, no disclosure was identified, on the basis of which a relevant comparison with the capabilities of the method claimed in the patent in suit could be instituted.
- 7.15.2 Even if the statement of problem as formulated by the Appellant at the oral proceedings were accepted, namely as being "to find a simplified, low temperature technique for providing a covering on pipes", the two documents referred to in the appeal as examples of the use of an uncured primer, namely E2 and E6 are, like E15, examples of high temperature techniques for factory use. Consequently, the skilled person would have no more incentive to apply such a measure in a low-temperature technique than he would the method according to E15.
- 7.15.3 Quite apart from this, it was not shown why the solution, of providing a layer of such an uncured primer between the pipe and the hot melt adhesive, which is an extra step, could be regarded as a "simplification". Consequently, even if E2 and E6 had attracted the attention of the skilled person for some reason, and even if he had considered adopting their teaching, despite the lack of incentive to do so, the result would not have corresponded to a solution of the problem as stated.
- 7.15.4 Consequently, the subject-matter of Claim 1 does not arise in an obvious way starting from the acknowledged prior art.

7.16 In summary, the subject-matter of Claim 1, and, by the same token, that of dependent Claims 2 to 11, involves an inventive step in the sense of Article 56 EPC.

Order


For these reasons it is decided that:

The appeals are dismissed.

The Registrar:


E. Görgmaier

The Chairman


C. Gérardin