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D E C I S I O N
of 10 July 2002

Case Number: T 0523/00 - 3.2.3

Application Number: 86100407.5

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IPC: F41H 1/02

Language of the proceedings: EN

Title of invention:
Ballistic-resistant composite article

Patentee:
ALLIEDSIGNAL Inc.

Opponent:
ACORDIS AG

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 84

Keyword:
"Clarity (yes)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
T 0728/98

Catchword:
-

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Case Number: T 0523/00 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 10 July 2002

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 3 March 2000 revoking European patent No. 0 191 306 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: J. du Pouget de Nadaillac
M. K. S. Aúz Castro
J. B. F. Kollar
J. P. B. Seitz

Summary of Facts and Submissions

I. The appeal is directed against the decision dated 3 March 2000 of an Opposition Division of the EPO, which revoked the European patent EP-B-0 191 306 for lack of novelty of the subject-matter of claim 1, as amended on 16 May 1996, in view the prior use of composite articles, namely antiballistic aramid fabrics ULTRAX® referenced W7630, W7640 and W7650 which were sold by the company VERSEIDAG-INDUTEX GmbH before the priority date of the patent in suit. The sales as such were not contested by the patentee, who essentially disputed the similarities between the sold fabrics and the present invention.

In the contested decision the Opposition Division held in particular that, since each fabric according to this prior use was first impregnated on both sides with Neoprene GRT, which is an elastomeric material, for example by dipping the fabric in a corresponding elastomeric solution, and since several fabrics were then superposed and subjected to a pressure and heat process, each of the individual fibers of the fabrics was as a consequence **substantially** coated and encapsulated by the elastomeric material, which corresponded to an essential feature of claim 1 as amended in opposition proceedings.

II. Among the documents filed during the proceedings before the first instance, the following are of importance for the present decision:

E15: EP-A-0 089 537;

E16: Modern Plastics Encyclopaedia, 1986-1987,

page 543;

E17: Affidavit dated 2 August 1995 of Dr Meffert;

E19: Letter dated 29 September 1995 from Mrs G. Harpell and M. Gerlach;

E21: Affidavit dated 18 August 1998 of Mr H. Veith;

E24: DE-A-2 916 745.

III. The proprietor of the patent - hereinafter the appellant - lodged the appeal and paid the appeal fee on 3 May 2000. He filed by fax a statement of grounds on 30 June 2000 and submitted on 3 August 2000 together with the written confirmation of his fax the following document:

E12a: Prospectus "ULTRAX®-Aramidgewebe gegen ballistische Einwirkungen", Verseidag-Industrietextilien GmbH, Krefeld, 1984 (1 page).

The respondent, opponent, filed a further declaration dated 8 August 2000 of Mr Veith which is referenced E26.

In response to a preliminary opinion of the board of appeal as expressed in the communication dated 28 February 2002 and attached to the summons to oral proceedings, the appellant filed on 10 May 2002 a new set of ten claims and new pages of the description as main request. He also filed a statement of Dr Sheldon Kavesh, reporting in particular tests made on available Verseidag products W7660 and calculations based on the published data of the Verseidag products (said document

is referenced E28).

IV. Claim 1 of this request reads as follows:

"A composite article of manufacture comprising a network of fibers having a tensile modulus of at least about 500 g/denier in a matrix of an elastomeric material characterised in that each of the individual fibres of the network is substantially coated with an elastomeric material, the matrix and coating occupy all the void volume left by the network of fibres, and the or each elastomeric material has a tensile modulus (measured at 25°C) of less than about 41300 kPa (6000 psi) and the fibers have an energy-to-break of at least 22 J/g."

V. Oral proceedings took place on 10 July 2002. The appellant submitted new pages of the description and microscopic photographs (50x and 63x) of laminates made of several layers of the Verseidag product W7660.

VI. The appellant has argued that the invention as claimed differs from the Verseidag products by two main features, namely the low tensile modulus of the elastomeric material and the substantial coating of the fibres, which both in the Verseidag products are at least not sufficiently proven to be reached. Since the present decision essentially deals with the second feature, the arguments of the appellant regarding this feature are summarised as follows:

The sample W7660, which concerns a single fabric, has shown that the fibres of the Verseidag products were not substantially coated, since the core of the fabric was not impregnated by the resin, only the sides of the

fabric as such were coated, confirming therefore the expression "coated fabrics" used for the samples W7630, W7640 and W7650 in E17 and E21. It is then important to determine what happens when several plies of such a fabric are bound together by hot pressing during the manufacture of the desired composite material, that is to say to know how the resin, which is initially in a solid state, has migrated into the product. The respondent was surprisingly incapable of providing any sample of such a composite and thus there was no visual evidence of a substantial coating of the fibres inside the composite itself. The respondent merely relied on the values given in the description of the patent in suit and concerning the resin material, arguing that the same techniques were used for the Verseidag products, so that the results should be the same. However, the amount of resin, which is necessary to achieve a continuous matrix together with a substantial coating of the individual fibres, depends on the size and arrangement of the fibres, the wettability of these fibres and the penetration capability of the impregnation resin under the specific conditions of the manufacturing processes. Important in this respect are the objectives and not the techniques alone, since according to the different possible objectives (total or partial impregnation or coating) the precise fine tuning of the impregnation material differs, although the same manufacturing technique of the laminates or composites is used. The tests and calculations disclosed in E28 and the microscopic photographs show that, in fact, the laminates obtained under pressure and heat from superposed layers of the Verseidag products have clear uncoated yellow fibrous cores and that the amount of rubber used for the coating of both sides of a single fabric of said Verseidag products is

insufficient to fill all the void volume, and thus to substantially coat all the fibres during the manufacturing of the above mentioned laminates.

The present invention can be considered as a development of the composite articles according to E15, since according to claim 1 of the patent in suit the present invention is a particular combination of fibres selected among those disclosed in E15 with a specific kind of coating and a specific matrix. In particular, by selecting a full matrix in combination with an elastomer material having a low tensile modulus, both for the coating and the matrix material(s), the ballistic efficiency of the composite is improved. One reason is that the strain forces of an impact are propagated along the whole length of the fibres. As shown by E16 and E19, high modulus elastomeric materials with tensile moduli up to 235,000 psi were known, so that the claimed tensile modulus limit has been introduced to define a clear limit between "soft" and "hard" elastomers. E15 first does not indicate that an elastomeric material would be advantageous for the coating and for the matrix; it rather directs the skilled person toward high modulus non elastomeric materials, see in this respect all the examples of E15 and the passage page 9, lines 28, 29, together with claims 3 to 5 of this prior art. Furthermore, there is absolutely no reference in E15 to any tensile modulus of an elastomeric material. The Verseidag products according to the alleged prior use do not teach to use a matrix, which fills the void volume between the coated fibres, so that at least this requirement of the present invention is not suggested. It is moreover still contested that it was sufficiently proven that the elastomeric material in these Verseidag products

had a tensile modulus under the limit specified by claim 1 of the patent in suit.

VII. The respondent objected first to the lack of clarity of the claims and then to the lack of novelty and of inventive step of the subject-matter of claim 1 by arguing as follows:

In claim 1, a contradiction appears between the features which mention an elastomeric matrix material and an elastomeric coating material, implying thus a single elastomeric material, and the feature relating to the tensile modulus which mentions "the **or each** elastomeric material". It is also not clear which meaning the term "fibres" has, when in two patent specifications of the appellant, namely the patent in suit (page 2, lines 54 to 56; page 3, line 43 to 46) and the patent EP-B-0 199 019 (see page 5), the appellant has given two different definitions of this term. The expression "substantially coated" is also unclear, especially as no definition of this expression can be found in the patent description (see decision T 728/98) and since this expression concerns an essential feature of claim 1 having regard to the alleged prior use. Claim 8 also by specifying a non-elastomeric material contradicts claim 1. Thus, Article 84 EPC is infringed.

In the Verseidag products, it has been shown that the yarns are at least coated and the expression "substantially coated" of claim 1 of the patent in suit includes in its meaning fibres which are not coated, that is to say the fibres which are in the interior of the yarns can be not coated. The evidence E28 is not reliable for at least three reasons: first, the product

W7660 used by the appellant as starting material was stocked before use, so that at least a partial vulcanisation of the elastomeric material, namely the Neoprene®, occurred and, thus, a correct manufacturing of the laminates could not be achieved. Secondly, the sample W7660 used for said manufacturing did not correspond to the products W7630, W7440 and W7650 of the prior uses, one main difference being the densities and thus the number of filaments which are higher in W7660 than in the other products, so that the migration conditions of the elastomeric material were not comparable. Finally, in the calculations which were filed by the appellant and concern the amount of resin, several errors can be seen, especially those relating to the thicknesses of the fabrics, so that the final result is wrong. Several examples of the present invention, which are given in the patent in suit, show results, which are less good than those of the prior art, so that it cannot be said, as argued by the appellant, that a particular choice of fibres and coating is sufficient to reach better results and thus it has to be assumed that in these examples the matrix was not complete. It follows that the expression "substantially coated" is to be broadly interpreted and thus the corresponding feature is fulfilled in the products according to the prior uses.

E15 represents the closest prior art and discloses polyethylene fibres having a preferred tensile modulus of at least 500 g/denier (page 4, line 33) and an energy to break of at least about 22 J/g, this last property being deduced from the data of the Examples C to F given in Table 1 on page 10. On pages 7 to 9, it is moreover indicated that the fibres in the form of monofilaments can be coated and incorporated into

composites having matrices made of elastomers, the matrices occupying all of the void space left by the network of fibres. In different examples of this prior art low density polyethylene is given as possible material for the matrix, so that, in fact, it is suggested to use matrix materials with a low tensile modulus. Therefore, the sole difference between the disclosure of E15 and the subject-matter of claim 1 of the patent in suit is to be seen in the fact that claim 1 specifies an upper limit for the tensile modulus. However, the Verseidag products have shown that the use of such a low modulus elastomeric material for ballistic-resistant composites was known and the prospect of the Verseidag GmbH firm (E12a) emphasizes the ballistic-resistant properties of these products, so that the person skilled in the art had all reasons to try to employ this elastomeric material in the above mentioned kind of composites according to E15.

Furthermore, it has not been proven that the claimed upper limit of the tensile modulus is a critical limit: in the patent in suit itself it is shown that prior art examples referenced 14, 15 and 17, although comprising a matrix material which is not an elastomer and having a tensile modulus above 6000 psi, show better results than Examples 4, 6 and 8 according to the present invention as claimed. The comparative tests shown in E19 are not relevant, for the mere reason that the elastomers used in these tests have tensile moduli either very much higher than the claimed limit or very much lower. Hence, this claimed upper limit is the result of a mere arbitrary choice without technical base.

VIII. The appellant requested that the decision under appeal

be set aside and that the patent be maintained on the basis of claims 1 to 10 filed as main request on 10 May 2002 and pages 2,3, and 19 of the description filed on the same day, as well as pages 4 to 6, 9 to 11, 16 and 18 filed in the oral proceedings and pages 7, 8, 12 to 15 and 17 of the description as granted and the figure according to the patent specification.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Admissibility of the new claims*

The wording of the new claim 1 differs from that of claim 1 according to the contested decision by the deletion of the words "or encapsulates" and by the explicit mention of the possible use of either the same or different elastomer(s) for the coating and the matrix. The deleted words were not in the granted claim 1 and were in fact superfluous, since according to the description of the patent in suit a coating is always used, thus implying an encapsulation. The possible use of a single or different elastomeric materials is supported by the passage on page 9, lines 28 to 33 of the description of the patent in suit, as originally filed. The new claim 1 complies with the requirements of Article 123(2) and (3) EPC.

The clarity objections of the respondent are not justified:

- Contrary to the interpretation of the respondent, the expressions "a matrix of an elastomeric material" and "coated with an elastomeric material" in claim 1 do not indicate whether the elastomeric materials for the coating and for the matrix are identical or not. Therefore, the following words " the or each" do not contradict the preceding features.

- The documents of a patent are to be considered as a self-contained whole, giving the words used their normal meaning in the art, unless in particular cases the description gives the words a special meaning. There is nothing in the EPC, which requires that terms used in different patents should have the same meaning. According to Article 69 EPC, the description and drawings of the patent, and not of other patents, shall be used to interpret the claims, that is to say the patent itself is its own dictionary. In the present case, the meaning of the term "fiber" is given in the description of the patent in suit, page 2, lines 55 and 56, together with the passage on page 3, lines 42 to 45, when yarns are implied. It follows that a fibre in the meaning of the patent in suit is the individual smallest element.

- The expression "substantially coated" means that the fibres are more or less completely coated and thus is clear.

- Claim 8 concerns a binding material, which binds a plurality of networks of fibres. Contrary to the view of the respondent, it has nothing to do with the material(s) used for the coating and matrix

purposes. Thus, no contradiction appears between claim 8 and claim 1.

Claim 1 consequently is clear (Article 84 EPC) and thus admissible. Claims 2 to 10, which are dependent claims, correspond to claims 2 to 10 as granted, claim 8 being clear.

The amendments concerning the description are of two kinds: all the passages or words which do not correspond to the present invention according to claim 1 were deleted, while the word "comparative" was added to those examples, which do not employ an elastomer material as coating and matrix material. Thus, the new pages of the description are admissible.

3. *Novelty*

3.1 Verseidag products according to the prior use

During the oral proceedings the respondent has indicated that in the Verseidag products "the yarns are at least coated" and then he grounded his novelty objection on a broad interpretation of the expression "substantially coated" of the contested claim 1, this expression in his view including **un**coated fibres in the interior of a yarn. By doing so, he seems to admit that only the yarns of the Verseidag products are coated, not the fibres. However, the requirement of claim 1 of the patent in suit is clear:
each fibre should be substantially coated and according to the description of the patent, when uncoated fibres are grouped together to form a yarn, the group of fibres is pulled through a solution of elastomeric material **to substantially coat each** of the individual

fibres, see pages 3, lines 42 to 46 and the last line of page 5 of the description as granted.

The respondent also argued that the Verseidag products as composites were moulded under pressure and heat conditions and with an elastomer amount, which were more stringent than those described in the description of the patent in suit for the moulding technique, so that, when according to the patent in suit a coating of each fibre should be achieved, this must inevitably be achieved also in the case of the Verseidag products. This argument cannot be followed, since the person skilled in the art, **when he knows** that he has to form a composite **with a particular result in mind**, namely to substantially coat each of the fibres and to fill the void volume between the fibres, will not only apply the general conditions of a moulding process, that is to say the needed pressures and temperatures, but he will also take additional measures beforehand according to the circumstances, so as to reach the particular wished result. The kinds of fibres which are used (filament, ribbon, strip,...), the tensile properties of the fibre material, the arrangement of the fibres (knitted, woven or not,..) or of the fibres layers, the configurations of the networks, the nature of the migrating elastomer materials and their capacities to flow into the network, their amounts relative to the fiber contents and so on.., are parameters which are to be considered in such a case and it is up to the skilled person in this technical field to take these appropriate measures, which consequently do not need to be necessarily given in the patent in suit. The respondent, when he has contested during the oral proceedings the calculations of the appellant according to E28, has pointed out the importance of the

thicknesses as such of the fabrics of the composite to be moulded and thus confirmed that parameters which are not disclosed in the patent in suit are nevertheless to be considered. It has never been proven that the above mentioned particular required result in its whole was wanted for the Verseidag products and a visual examination of a Verseidag sample referenced W7660 provided by the appellant in case T 857/95 has shown that only the sides of a single fabric were coated, not the core, so that it remains uncertain whether during the moulding of several of theses fabrics together, each of the fibres would have been substantially coated and the void volume between the fibres completely filled. In contrast thereto, the description of the patent in suit indicates that the **coated fibres** are arranged into a network or can be processed into a simple composite, and that, during the coating technique according to Example 4 of the patent in suit (immersion in a solution of thermoplastic elastomer), the aim was to coat each of the individual fibres (see once more the description, page 5, last lines), contradicting in this respect the opinion expressed in the decision under appeal, last paragraph of page 6. Sample W 7660 has shown that this result was not reached at least with one Verseidag product, although the same technique should have been used according to E26. It is further noted that Mr Veith and document E12a mentioned a coated fabric or a fabric coated on both sides, and not coated fibres. Mr Veith moreover declared that all Verseidag products listed in the Verseidag prospect (E12a), that is to say inter alia the product W7660 as well as the products W7630, W7640 and W7650, were identically treated, so that there is no reason to make a distinction between the Verseidag products according to the prior use, namely those

referenced W7630, W7640 and W7650, and that referenced W7660, provided by the appellant.

The respondent has never been able to **directly** show that the Verseidag products fulfil the above requirement of claim 1, although it had the burden of proof. It always indirectly argued by interpreting in a particular way the above mentioned expression. In its view, this interpretation should also be supported by the fact that the results of Examples 4, 6 and 8 of the patent in suit show ballistic results which are worse than those of the prior art Examples 14, 15 and 17 also described in the patent in suit, showing therefore - according to the respondent - that the matrix in these examples was not completely filling the void volume. However, this last conclusion of the respondent is a mere supposition without any proof, so that this whole argument is to be rejected (see also point 4.1 under).

Therefore, contrary to the conclusion expressed in the first lines of the last paragraph of page 6 of the decision under appeal, it has not been proven by the respondent that, in the Verseidag products, at least each of the fibres was substantially coated by the elastomeric material.

3.2 E24 (DE-A-2 916 745)

In the counter-statement to the grounds of appeal the respondent argued that this prior document destroyed novelty of the composite according to claim 1. However, during the oral proceedings, this document was no longer referred to. In the communication attached to the summons to the oral proceedings, the board made reference to the decision T 857/95, in which for a

similar invention the content of E24 was analysed. Briefly, it was indicated that the disclosure of this prior art is too confusing, since the words "a sufficiently soft resin" and "an elastomer" appear separately in one passage of this document, so that the reader of this document does not know whether the qualification "sufficiently soft" applies also to the elastomer. Other disclosures of this document seem to point the reader away from such an interpretation. Moreover, the expression "sufficiently soft" itself is not clear enough to necessarily mean a tensile modulus of the elastomer under the limit given by claim 1 of the patent in suit.

3.3 For all these reasons, the composite according to claim 1 of the patent in suit is new having regard to the above referred prior art disclosures, which were considered by the respondent as novelty-destroying (Articles 52 and 54 EPC).

4. *Inventive step*

According to the respondent, starting from E15 which represents the closest prior art, the present invention as claimed only differs by the numerical specification of an upper limit of the tensile modulus of the elastomeric material(s) and this feature is either suggested by the above mentioned prior use or has no technical meaning, being the result of an arbitrary choice.

4.1 The present invention

The appellant has not claimed that the tensile modulus limit given in claim 1 is a critical value. Important

in his view is only to make a clear distinction between "low" and "high" tensile moduli for the elastomeric materials and this could only be made by choosing a numerical value, which more or less reflects this distinction. The appellant has recognised that it may be that similar ballistic results could be obtained with a higher tensile modulus (10000 psi was mentioned), but the numerical value was also chosen by taking into account the need for a certain flexibility of the composites, which can be used in vests for the police staff. What is important in the present invention is therefore the idea of providing a limit for this parameter of the elastomeric material and to show that the elastomeric material has to be below this limit, that is to say a "soft" elastomer, as defined by claim 1, has to be used.

Moreover, according to the description, the aim of the patent in suit is to provide a ballistic-resistant composite which provides **a selected level** of ballistic protection while employing a reduced weight of protective material compared to conventional ballistic-resistant armour structures or, **alternatively**, an **increased** ballistic protection when the composite article has a weight equal to the weight of a conventionally constructed piece of composite armour. It follows that an improved ballistic protection is not always wanted, so that the argument of the respondent based on the results provided by the Examples 4, 6 and 8 of the patent in suit is not relevant. The description itself of the patent in suit - see the paragraph concerning Example 26 on page 11 - indicates that the ballistic resistance is reduced when twisted yarns are employed as is the case in Example 8 or is good when the yarns are pre-impregnated prior to

weaving (Example 4) and even better when straight, uniformly aligned fibres are used (Examples 1, 14, 15 and 17). It shows that the ballistic resistance depends on a great number of criteria, so that comparisons can only be correctly made between examples which show at least a certain number of similarities. It also cannot be denied that, according to the single drawing of the patent in suit (Specified Energy Absorption of a composite in relation with the fibre density area), at least Examples 1, 3 and 13 according to the present invention show substantial improved ballistic properties compared to the same prior art examples.

For these reasons, it cannot be said that the tensile modulus limit as claimed has no significance and is the result of an arbitrary choice.

Moreover, the solution according to claim 1 does not only reside in this feature concerning a selected coating and matrix material. Claim 1 recites three other features, namely selected fibres, a substantial coating of each fibre and the filling of the void volume between the fibres, and the combination of these four features which allows the above mentioned goal to be reached should therefore be considered for the examination of inventive step.

4.2 E15 (EP-A-0 089 537)

As shown by claim 1 of this prior art, which stems from the appellant and designates the same inventors as the patent in suit, the content of this document is essentially directed to the choice of fibres for ballistic resistant materials, which preferably comprise only fibres (lines 1 and 2 of page 4),

although composite materials, at least in the meaning of the patent in suit that is to say fibres combined with a major matrix material, are also described on pages 7 and 8 of this document and in some examples. Two main groups of fibres are disclosed, namely **polyethylene** fibres **with a tensile modulus** of at least 300 g/denier, **preferably 500 g/denier**, and a tenacity of at least 5 g/denier, **and polypropylene** fibres with a tensile modulus of at least 160 g/denier and a tenacity of at least 8 g/denier, an average molecular weight limit being also added.

The use of coated fibres is envisaged - see page 7 -, "a variety of polymeric and non-polymeric materials" forming the coating material; two specified materials which are not elastomers are preferred. The fibres, possibly used with coatings, may be **monofilaments or multifilaments**. Pages 7 and 8 further indicate that, although large amounts of coating material can be used (1 to 150% by weight of fibres), it is preferred to have a relatively minor proportion of coating (1 to 25%), since the ballistic properties are almost entirely attributable to the fibres.

Complex composite materials are the subject-matter of a single paragraph on page 9, which reads as follows:

"Also suitable are complex composites containing coated fibers in a matrix, with preferred complex composites having the above-described coated fibers in a thermoplastic, elastomers or thermoset matrix; with thermoset matrixes such as epoxies, unsaturated polyesters and urethanes being preferred." No other mention of elastomers appears in this prior art, and in particular in all of the at least twenty examples which

follow in this prior art. From data given in Table 1 of Example 1, polyethylene fibres with an energy-to-break above the limit of claim 1 of the patent in suit can be deduced (Examples C to F). The ballistic properties of the composites according to at least Examples 9 and 10 (fibres falling under the definition of claim 1 of the patent in suit, but coated with either low or high density polyethylene and cured under pressure and heat) were compared to a comparative Example 11, identically produced but with aramid fibres, namely Kevlar® 29, coated with a phenolic polyvinyl butyrol resin. The conclusions as set on page 15 are that the ballistic performance between the three tested examples are comparable, but, "since it is known to produce polyethylene fibers with higher tenacity" (30 g/denier or more, compared to the 22 g/denier of Kevlar® 29), "it is expected that these fibers would substantially outperform aramid fibers for ballistic applications". An identical conclusion is given with Example 20.

4.3 Differences between the disclosure of E15 and the present invention according to claim 1.

The respondent has recognised that the tensile modulus limit mentioned in claim 1 of the patent in suit for the elastomeric material(s) is not disclosed by E15. However, as far as the coating and matrix materials are concerned, the teaching of E15 is quite silent on the tensile moduli of these materials. It is not because some examples of E15 may comprise matrix materials with a tensile modulus under the claimed limit that the requirement as such for "soft" elastomeric materials within the meaning of claim 1 of the patent in suit, or even for "soft" matrix materials is suggested. On the contrary, as seen above, the sole mention in E15 of

elastomers appears together with thermoset materials, which according to the examples listed in the last sentence of the above given passage of page 9 are hard matrix materials, so that E15 in fact directs the skilled person toward the use of these hard matrix materials, which are said to be preferable, elastomers being not preferred.

Fibers falling within the scope of the contested claim 1 are indeed disclosed by E15; the description of the patent in suit expressly mentions polyethylene and propylene fibres as two important groups of fibres of the present invention. However, this description also discloses other groups of fibres, for example aramid fibres like Kevlar® 29, which are used in the examples of the patent in suit. Above all, Claim 1 of the patent in suit gives **a definition** of the fibres, which is not disclosed in E15; for example, no mention of the parameter energy to break appears in E15, which further does not suggest the limit 500 g/denier for the tensile modulus of the fibres as selection parameter: in E15 it is only a preferred value for the polyethylene fibres. It follows that claim 1 gives a selection of fibres which is different from that of E15.

Moreover, the whole combination of features of claim 1 is new: it is not because E15 discloses separately that the fibres could be coated or that the matrix may occupy all the void space left by the fibres and could be made of elastomers, that E15 teaches or suggests that these conditions should be linked together as requirements and further be combined with a selected kind of fibres, which only overlaps partly the selection of fibres disclosed in E15. When the respondent brings together these four conditions on the

basis of pieces of information separately gathered from E15, he makes an a posteriori assessment, which is not admissible.

Therefore, claim 1 differs not only by the mention of an upper limit for the tensile modulus of the elastomeric materials, but also by the whole claimed combination of features as such. It is even doubtful whether E15 suggests to the person skilled in the art to substantially coat each of the fibres, said fibres being the smallest elements of the network, having regard to the passage of page 7 of this prior art, which indicates that the fibers may be monofilament or multifilaments.

4.4 It follows that the combination of E15 with the disclosure of the prior use is not sufficient to reach the subject-matter of claim 1 of the patent in suit, since the Verseidag products do at least not teach to substantially coat each of the fibers within the meaning of the patent in suit, whereas E15, page 8, directs the person skilled in the art to rather coat the fibres "with a relatively minor proportion of coating".

4.5 Furthermore, it is not clear for which reason the person skilled in the art would combine these two prior art disclosures:

E12a is a prospect of a firm, the aim of which being to attract the potential customers toward the Verseidag products which comprise Kevlar® 29 fibres. The mere mention of good ballistic properties without technical data would be considered by the person skilled in the art before all as an advertising means. E12a moreover

does not indicate the reasons for the said improved ballistic properties. Thus, when E15 teaches that "hard" matrix materials are preferable rather than elastomers or other materials and that polyethylene fibres with high tenacity are preferred to Kevlar® 29 fibres, thus directing the skilled person in at least two directions which differ from the disclosure of the Verseidag products, a combination of these two disclosures is not logical.

4.6 The subject-matter of claim 1 of the patent in suit, therefore, involves an inventive step within the meaning of Article 56 EPC. Claims 2 to 10, which are dependent on claim 1, concern the same composite with additional features and consequently are allowable.

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 as amended in the following version:

   Claims: 1 to 10 filed as main request on 10 May 2002.

   Description: pages 2, 3 and 19 filed on 10 May 2002.
   pages 4 to 6, 9 to 11, 16 and 18 filed in the oral proceedings,
   pages 7, 8, 12 to 15 and 17 as granted.

   The single figure according to the patent specification.

The Registrar: The Chairman:

A. Counillon C. T. Wilson