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D E C I S I O N
of 6 March 1995

Case Number: T 0834/92 - 3.2.5

Application Number: 87107192.4

Publication Number: 0250826

IPC: D07B 1/04

Language of the proceedings: EN

Title of invention:

Cut resistant jacket for ropes, webbing, straps, inflatables
and the like.

Patentee:

Allied Signal Inc.

Opponent:

Stamicarbon B.V,

Headword:

Cut resistant jacket/Allied

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

"Novelty (yes)"
"Inventive step (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0834/92 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 6 March 1995

Appellant: Stamicarbon B.V,
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Representative:

Respondent: Allied Signal Inc.
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office given orally on the
2 June 1992 and issued in writing on the 13 July
1992 concerning maintenance of European patent
No. 0 250 826 in amended form.

Composition of the Board:

Chairman: C. V. Payraudeau
Members: M. H. M. Liscourt
A. Burkhart

Summary of Facts and Submissions

- I. By an interlocutory decision taken orally on the 2 June 1992 and notified with the grounds to the parties on the 13 July 1992, the Opposition Division found that, account being taken of the amendments made by the proprietor, the European patent No. 0 250 826 and the invention to which it relates were meeting the requirements of the EPC.
- II. The patent in suit concerns a "cut resistant article" comprising a jacket comprising a fabric of a yarn surrounding a less cut resistant member characterised in that the yarn of said jacket consists of at least one high strength strand wrapped with a fiber. The said patent also Claims the yarn, the fabric and the jacket.
- III. According to the amended Claims considered as allowable by the Opposition Division, the yarn has one or more high strength longitudinal strand having a tensile strength of at least 1 GPa, wrapped with a fiber of aramid, ultra high molecular weight polyolefin, carbon, fiber glass or a combination thereof, wherein all longitudinal strand consists only of aramid, high molecular weight polyolefin, carbon, fiber glass or a combination thereof.
- IV. The Opposition Division found that the so defined Claims did not infringe Article 123(2) EPC, in that they only contained features already claimed or disclosed in the original application and that the fact that the use of metal fibers in the strand, which was originally mentioned in the patent application as filed and in the

patent as granted, was now excluded did not extend the scope of the patent with respect to the original disclosure since the possible materials for the strand were therein only given as alternatives.

The Opposition Division also found that the subject-matter of the Claims were new and inventive in view of the prior art cited by the Opponent i.e.:

- D1: US-A-4 384 449
- D2: US-A-4 470 251
- D3: EP-A-0 118 898
- D4: M. W. Wardle, Journal of Coated Fabrics, volume 7 (July 1977), page 3 to 23
- D5: EP-A-0 027 708
- D6: European Chemical News, 19 May 1986, page 1
- D7: Journal of Commerce, 21 May 1986, page 8A.
- D8: US-A-3 883 898
- D9: US-A-3 953 893

The Opposition Division held, in particular, that the document D5 represented the nearest state of the art with respect to the amended Claim 1 relating to a cut resistant article since it was the only cited document which related to such an article. The cut resistant article according to the document D5 did not however made use for its jacket of a fabric having the features as claimed in Claim 1 of the patent in suit. The subject-matter of Claim 1 was therefore new. Since the documents D1 to D3, which disclosed knittable yarns for manufacturing protective garments comprising a longitudinal strand wrapped with a fiber, all required the use of a stainless steel wire for the longitudinal strand, the combination of the teaching of document D5 with the teaching of these other documents would not have lead to the invention. As concerned the other independent claims respectively relating to a yarn, to a

fabric made from this yarn and to a jacket made from this fabric, the nearest state of the art was represented by the documents D1 to D3 which all required the use of a metal wire for the longitudinal strand. The subject-matters of these claims were therefore new and inventive in view of these documents which did not teach the possibility of avoiding the use of a metal wire.

- V. The Appellant (Opponent) lodged an appeal against this decision.
- VI. In the Statement of Grounds, the Appellant substantially maintained the objections he had already raised before the Opposition Division that the subject-matter of the claims had been extended beyond the content of the original disclosure and was in any case obvious in view of the cited prior art.
- VII. In answer to a communication of the Board and at the oral proceedings which were held on the 6 March 1995, the Respondent (patent Proprietor) filed four new different sets of claims as main, first, second and third auxiliary requests.

(a) The independent claims according to the main request (filed on 7 February 1995) read as follows:

"1. A cut resistant article comprising a cut resistant jacket comprising a fabric of yarn surrounding a less cut resistant member characterised in that the yarn of said jacket consists of at least one high strength longitudinal strand having a tensile strength of at least 1 GPa, selected from aramid, ultra high molecular weight polyolefin, carbon, fiber glass or a combination thereof, wrapped with a fiber selected from aramid

fiber, ultra high molecular weight polyolefin fiber, carbon fiber, metal fiber, polyamid fiber, polyester fiber, fiber glass, polyacrylic fiber, normal molecular weight polyolefin fiber or a combination thereof."

"10. A yarn for the manufacture of cut resistant fabric consisting of one or more high strength longitudinal strands of aramid, (ultra)high molecular weight polyolefin, carbon, fiber glass or a combination thereof, said strands having a tensile strength of at least 1 GPa, wrapped with a fiber of aramid, ultra high molecular weight polyolefin, carbon, fiber glass or a combination thereof."

(N.B. the word "ultra" has been omitted line 3 of this claim but the Board has corrected this obviously unintentional error).

"11. A fabric formed from a yarn according to Claim 10."

"12. A cut resistant jacket formed from a fabric according to Claim 11."

(b) The set of claims according to the first auxiliary request (also filed on the 7 February 1995) only differs from the claims according to the main request in that the expression "a rope, webbing, strap, hose or an inflatable structure" has been substituted, in the preamble of Claim 1, to the expression "a less cut resistant member" and in that Claim 3 according to the main request which contains this limiting feature has been consequently cancelled.

(c) The set of claims according to the second auxiliary request (filed during the oral proceedings) is identical to Claims 1 to 9 according to the main request.

(d) The set of claims according to the third auxiliary request (also filed during the oral proceedings) is identical to Claims 1 to 8 according to the first auxiliary request.

VIII. In support of these requests, the Respondent submitted essentially that:

The deletion from a list containing a certain number of other possible constituents for the strand of one of the possible constituents (metal) was a permissible disclaimer. The exclusion of one of the constituents did not lead to the addition of subject-matter. The claims on file did not therefore infringe the provision of Article 123(2) EPC.

The invention concerned the provision of an article having a cut-resistant jacket surrounding a less cut resistant article, such as a rope, webbing, strap, hose or an inflatable structure. Said article had to be considered as a whole, so that a glove or article of clothing could not be considered to fall within the scope of the claims.

The claimed invention was inventive in view of the document D5 which represented the closest prior art according to the impugned decision because the cut-resistance according to the disclosure of this document was not provided by the jacket itself but by a solid polymer cover provided by extrusion over the jacket.

The articles of clothing disclosed in documents D1 to D3 were intended to provide cut-resistance, but it was clear that said resistance was provided by longitudinal wire strands.

There was no suggestion in these documents that the particular combination of a longitudinal core with an aramid covering would act to improve the total cut-resistance of the material.

Therefore, even if the skilled person were to consider using a single covering on the hose of the document D5 to provide both properties, there was no reason why he should have chosen a yarn constructed in the manner according to documents D1 to D3.

There was nothing which would have lead the skilled person to conclude that, in order to provide the necessary combination of burst- and cut- and abrasion-resistance, it was necessary to do anything other than to provide a fabric formed from metal wire on the surface of the inner hose.

- IX. At the end of the oral proceedings, the Appellant requested the setting aside of the decision of the Opposition Division and the revocation of the patent in its entirety.

The Respondent (Proprietor of the patent) requested that the appeal be dismissed and that the patent be maintained in amended form on the basis of the main, first, second and third auxiliary request in this order.

Reasons for the Decision

1. *Interpretation of the claims*

In the claims, the words "comprising" and "consisting" have been used. As confirmed by the Respondent at the oral proceedings and accepted by the Appellant, the word

"comprising" is interpreted as meaning that the mentioned element is contained in the article while other elements may be present, while where the word "consisting" is used, only the mentioned element is present.

2. *Main request*

Since Claim 10 relates to a yarn which is used for manufacturing a fabric which is used to make a jacket, the said jacket being part of the cut resistant article claimed in Claim 1, the scope of Claim 10 is broader than the scope of Claim 1 and Claim 10 should therefore be examined first.

2.1 *Admissibility of the amendment to Claim 10*

With respect to corresponding Claim 12 of the patent as granted, this claim has been amended essentially by substituting the wording "consisting of" to the word "comprising", which means, according to the above interpretation, that the longitudinal strand does not comprise any metal wire whereas this possibility was left open in the granted Claim 12.

Such an amendment is a clear limitation, and since the list of materials given in Claim 10 was already mentioned as possible alternatives in the patent application as filed (see Claims 4 and 5 as filed), the new Claim 10 does not extend the scope of the patent beyond the content of the application as filed.

Therefore, Claim 10 does not contravene the provisions of Article 123(2) and (3) EPC.

2.2. *Novelty of the subject-matter of Claim 10*

The present Claim 10 is limited to a yarn consisting of (comprising only: see point 1 above) aramid, ultra-high molecular weight polyolefin, carbon, fiber glass or a combination thereof as strand of the core.

The document D1 discloses (see the cover page and the figure on the same page) a yarn for the manufacture of a cut resistant fabric comprising a core of flexible wire alongside an aramid fibre strand, with aramid fibre strands wrapped thereon.

The Respondent has not denied that the core strands of wire and aramid fibre have a tensile strength of at least 1 GPa. The yarn which is the subject-matter of Claim 10 differs therefore from this state of the art, disclosed in D1, by the fact that the use of a metal strand in the core of the yarn is now excluded.

The subject-matter of Claim 10 is therefore new with respect to this document and also with respect to the other documents D2 and D3 cited against the subject-matter of Claim 10 since these documents also concern yarns having a core comprising a metal strand.

2.3 Inventive step of the subject-matter of Claim 10

The yarn which is the subject-matter of Claim 10 differs from the yarn disclosed in the document D1 which, in the opinion of the Board, represents the nearest state of the art, essentially in that its core does not comprises a metal wire.

Such a feature, which consists in removing one of the composing elements of a yarn can only be considered inventive if there is any reason which could deter the persons skilled in the art from trying using it or if by such suppression unexpected results would be obtained.

There is no doubt that the idea of trying using a yarn without a wire for making cut-resistant articles whether knitted, woven or braided, should be obvious to the person skilled in the art. He would perhaps expect that the cut-resistancy would be eventually lower than when a wire is used but this would not prevent him from trying it at least for some applications.

On the other hand, the patent in suit does not teach that yarns, the core of which does not include a wire, differ in any unexpected way from yarns containing a wire in their core. On the contrary, the examples given in the patent application as filed and in the patent as granted relate exclusively to yarns having a core comprising a longitudinal metal strand and a parallel strand of a ultra-high molecular weight polyethylene fibre or of an aramid fibre. Therefore, the general teaching of the patent in suit is that the most advantageous embodiments of the invention should use such composite cores and that even if the use of a non-metallic longitudinal strand in the core is a possibility, it does only provide effects that the skilled person could have expected. The Respondent has never submitted that such unexpected advantages were obtained.

The yarn which is the subject-matter of Claim 10 is therefore obvious for the person skilled in the art.

- 2.4 Since the subject-matter of Claim 10 of the main request does not involve an inventive step in the meaning of Article 56 EPC, the main request cannot be granted.

3. *First auxiliary request*

Claim 9 of this request reads exactly as Claim 10 of the preceding main request. The subject-matter of said Claim 9 is therefore not allowable for the same reasons and the first auxiliary request of the Respondent cannot therefore be granted.

4. *Second auxiliary request*

The set of claims according to this request only comprises one independent Claim 1 relating to an article and 8 dependent Claims 2 to 9 relating to different embodiments of the article according to Claim 1.

4.1. Novelty of the subject-matter of Claim 1

The document D5, considered by the Opposition Division as representing the nearest state of the art, does not disclose the use of a fabric made from a composite yarn having a core consisting of at least one high strength longitudinal strand wrapped with a fiber. The subject-matter of Claim 1 is therefore new in view of this document.

The document D3 however discloses a protective garment such as a glove constructed of yarn comprising a core having one or more strands of flexible wire and a fiber strand (which is preferably a polyester but may also be aramid (see page 6, line 9)) and a covering of one or more of fiber strands wrapped on the core.

This document does not specify that the strands making up the core should have a tensile strength of at least 1 GPa but the Respondent has not contested that the core of a yarn having the features disclosed in this

document did in fact have necessarily this tensile strength.

The yarn disclosed in the above mentioned document contains a metal wire in the core. However, the use of such metal wire in the core of the yarn used to make the fabric of the jacket according to Claim 1 of the present auxiliary request cannot be considered as formally excluded due to the wording "**at least** one high strength longitudinal strand..." in the characterising part of this claim.

The very general wording used in Claim 1 (a cut resistant article comprising a jacket surrounding a less resistant article) covers all articles which comprise such features. A liner, such as described in document D3 according to which a liner 14 is inserted into a shell 13 which corresponds to the cut resistant jacket according to present Claim 1 (see page 4, lines 23 to 24), because of the composition of the yarns from which it is made, is less cut resistant than the jacket so that it may be considered as "the less cut resistant member" mentioned in Claim 1 of the impugned patent.

For these reasons, the subject-matter of Claim 1 according to the second auxiliary request cannot be considered as novel, and therefore this request cannot be granted.

It should be noted that, even if Claim 1 were limited in order to formally exclude the use of a metal wire in the yarn, this limitation, which would give novelty to the subject-matter of the claim, could nevertheless not justify an inventive step for the reason given above when examining Claim 10 of the main request.

5. *Third auxiliary request*

5.1 Novelty

The Claim 1 according to the third auxiliary request differs from Claim 1 of the second auxiliary request in that the wording "less cut resistant article" has been replaced by "a rope, webbing, strap, hose or an inflatable structure". Although this claim does not formally contain the previous limitation that the protected member is less cut resistant than the jacket, this feature must be considered as implicitly included in the claim since the aim of the jacket is to protect the said member.

Due to the limitation to particular less cut resistant members which do not include the protective garment disclosed in the document D3, this latter cannot be considered as destroying the novelty of the subject-matter of the present Claim 1.

5.2 Inventive step

The decision under appeal has considered that the closest prior art to the subject-matter of Claim 1 was the document D5 because it is the only cited document disclosing a article such as a hose comprising a jacket comprising a fabric of yarn surrounding an inner liner of thermoplastic elastomer material. However, according to this document, the abrasion and cut resistant feature is conferred to the hose not by the jacket which is only a textile reinforcement layer but by a cover made of a polyurethane elastomer (see page 4, lines 18 to 23 of the document D5).

The question to be decided is therefore whether the person skilled in the art wanting to improve the hose structure known from D5 or any other members enumerated in Claim 1 (i.e. rope, webbing, strap or inflatable structure) (not only could but) would have seriously considered using for the protecting jacket the fabric used for manufacturing cut resisting gloves.

The documents D4, D6 and D7, which are publications which may be considered as representing the general knowledge of the person skilled in the art, clearly show that aramid and ultra-high molecular weight polyolefin fibers were well known in the field "for end-uses such as cut- and tear-resistant clothes and sail cloth" (D6) and ropes and cables (D7). According to the document D4 (cf. abstract), aramid fibers "have found utility in a wide range of applications, such as tire cord, hose reinforcement, conveyor belts, ropes and cables, protective clothing, boat hulls, and aerospace composites".

The person skilled in the art was consequently well aware that the protective clothing belongs to the same technical field as the ropes, cables, hoses and inflatable structures such as tires and would have therefore been incited to try using for these structures the fabric already known for the protecting clothing such as gloves.

Therefore, the subject-matter of Claim 1 according to the third auxiliary request does not involve an inventive step and is not patentable within the meaning of Article 56 EPC. Thus, the third auxiliary request cannot be granted.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:



A. Townsend

The Chairman:



C. Payraudeau