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**D E C I S I O N**  
of 25 July 1995

**Case Number:** T 0725/91 - 3.2.5  
**Application Number:** 84112118.9  
**Publication Number:** 0143288  
**IPC:** D02H 5/02  
**Language of the proceedings:** EN

**Title of invention:**

A method for the obtaining of chains or fractions wound on beams, starting from a series of continuous, partially-drafted, thermoplastic yarns

**Patentee:**

VAL LESINA S.p.A.

**Opponent:**

Rhône-Poulenc Rhodia Aktiengesellschaft

**Headword:**

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**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step"  
"Substitution of a step known per se in a known process (not obvious) "

**Decisions cited:**

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**Catchword:**

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Case Number: T 0725/91 - 3.2.5

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.5**  
**of 25 July 1995**

**Appellant:** VAL LESINA S.p.A.  
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**Representative:** Gervasi, Gemma, Dr.  
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**Respondent:** Rhône-Poulenc Rhodia Adkiengesellschaft  
(Opponent) Engesserstr 8  
D-79108 Freiburg (DE)

**Representative:** -

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office dated 19 July 1991 revoking  
European patent No. 0 143 288 pursuant to  
Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** C. V. Payraudeau  
**Members:** M. H. M. Liscourt  
H. J. Seidenschwarz

### Summary of Facts and Submissions

I. An appeal has been filed by the Patentee against the decision of the Opposition Division to revoke the patent No. 0 143 288 which had been granted on the basis of the application No. 84 112 118.9.

II. During the opposition proceedings, the following documents have been taken into account for assessing inventive step:

D1: EP-A1-0 091 549

D2: FR-A-1 235 718

D3: DE-A-2 008 338

D8: FR-A-1 305 832

The Opposition Division revoked the patent on the ground that the subject-matter of the claimed process, although new, did not show the required inventive step in relation to the document D1 reflecting the nearest state of the art when combined with the teaching of document D3.

The appeal is based on the patent as granted.

III. Claim 1 of the patent reads as follows:

"1. A process for the preparation of chains or fractions of chains of continuous, synthetic completely drawn yarns of thermoplastic material selected from the group consisting of polyester, polyamide, polyethylene and polypropylene, said chains being wound on weaving beams, in which process a series of at least 24 yarns made of substantially parallel and partially drawn filaments are simultaneously drawn when immersed in a vat containing a thermostatic liquid and subjected to a shrinkage and

thermosetting treatment before being wound on a weaving beam, characterised in that the drawing of the yarns in the vat is carried out in the absence of a sizing agent, and in that, after the drawing step and before the shrinkage and thermosetting treatment, the yarns are subjected to an interlacing treatment using fluid jets, said interlacing treatment being carried out while the yarns are still wet."

- IV. In his grounds of appeal and in his further submissions in writing, the Appellant (Patentee) essentially submitted that the invention resided in a succession of steps, most of them were known per se. However, the order of the combination was such as to obtain a result which was not obtainable with the processes of the prior art. The process according to the document D1 which was the starting point of the invention was essentially characterised in that the drafting and sizing treatments were carried out simultaneously. With respect to the teaching of this prior art, the invention as claimed in Claim 1 was characterised in that the sizing step was completely omitted and replaced by an interlacing treatment. However, this interlacing treatment, known per se, was effected in a very particular manner, i.e. directly after the drafting step and while the yarn were still wet. This process presented the advantage not only of avoiding the sizing step and the subsequently desizing treatment but also of obtaining a yarn having outstanding properties. Document D3 taught to replace the sizing treatment by an interlacing treatment but did not disclose nor suggest to carry out the interlacing treatment while the yarns were still wet. In fact, the treatment of the yarn with an "Appretur" in solution before the interlacing step according to the document D3 did not mean that the yarn was still wet while being submitted to the interlacing step. First, the solvent was not necessarily water and even in the case of water,

the quantity of water transferred to the yarn would have been important only in the limit situation chosen by the Respondent. Moreover, the yarn was dried before being submitted to the interlacing step. Considering example 1 of the document D3, the amount of solvent on the yarn corresponded to a percentage which was certainly not sufficient to consider that the yarn was wet.

V. In his various written submissions filed during the appeal proceedings, the Respondent (Opponent) did not contest the novelty of the subject-matter of the claims of the patent in suit and agreed with the Appellant to consider the document D1 as representing the closest prior art. He submitted that, however, the skilled person wanting to avoid the sizing step in the process according to the document D1 would have considered the documents D2 and D3 which both teach that it is possible to replace the sizing step by an interlacing step. According to the document D3, the yarns are submitted to a interlacing treatment directly after a treatment with an "Appretur" in a solvent which could be water. Therefore, the characterising feature that the interlacing treatment was carried out on the yarn while they were still wet was known as rightly recognised by the decision under appeal. He also submitted that the document D8 taught that the interlacing treatment should be made on the yarn while still wet since this document indicated that the yarn could be wetted before being interlaced.

The skilled person would therefore be led to combine the teaching of document D1 with the teaching of the document D3 (or of the document D8) and would thereby come to perform the method according to Claim 1 without having to show inventive activity.

VI. With a communication pursuant to Article 110(2) EPC, the Board expressed the preliminary opinion that the person skilled in the art would not consider that the document D3 did teach to carry out the interlacing treatment on the yarn while still wet. Document D3 disclosed that the yarn should be treated with an "Appretur" before being interlaced. The "Appretur" used is in solution which is at least in great part evaporated before the interlacing treatment. As regards the document D8, the possible wetting of the yarn was mentioned as an alternative to reduce the interlacing intensity. The person skilled in the art would not have any reason to combine the teaching of this document with the teaching of the document D1.

#### **Reasons for the Decision**

1. *Novelty*

Document D1 discloses a process comprising all the steps mentioned in the preamble of Claim 1 of the patent in suit but none of the features of the characterising part of this claim. The other cited documents (D2, D3 and D8) relate to processes which comprise an interlacing step but not the other features of the process according to Claim 1. The subject-matter of Claim 1 is therefore novel in view of the cited prior art. The novelty of this subject-matter was also acknowledged by the Respondent and was therefore not in dispute.

2. *Inventive step*

2.1 According to the document D1 which represents the state of the art nearest to the claimed process, it is known to prepare chains by performing a treatment in which

continuous synthetic completely drafted yarns of thermoplastic material selected from the group consisting of polyester, polyamide, polyethylene and polypropylene, are wound on weaving beams to form chains in which process a series of at least 24 yarns made of substantially parallel and partially drafted filaments are simultaneously drafted when immersed in a vat containing a thermostatic sizing liquid and subjected to a shrinkage and thermosetting treatment before being wound on said weaving beam.

2.2 The treatment which is the subject-matter of Claim 1 differs from this state of the art through the following features:

- (a) the drawing of the yarns in the vat is carried out in the absence of a sizing agent,
- (b) the yarns are subjected to an interlacing treatment, after the drawing step and before the shrinkage and thermosetting treatment,
- (c) said interlacing treatment being performed by using fluid jets,
- (d) said interlacing treatment being carried out while the yarns are still wet.

2.3 It is known from document D2 to submit continuous thermoplastic yarns to an interlacing treatment with jets a fluid such as air or steam. However, the process disclosed in this document is a complete process which does not comprise any of the process steps according to the preamble of Claim 1 of the patent in suit. Therefore, the person skilled in the art would not have had any reason to combine the teaching of this document with the teaching of the document D1. Even if he would

have done it, he would have added this interlacing step to the other steps of the process of the document D1 but not substituted it for the sizing step since it is notably mentioned in D2 (page 14 lines 31 to 34) that the yarn may be sized, fixed etc., as any other yarn.

Therefore, the combination of the teaching of the document D2 with the teaching of the document D1 would not lead to the claimed invention.

2.4 Document D8 mentions (page 8, right column, second paragraph) that the frequency of the periodic variation of the interlacing intensity should be controlled and that it is possible to obtain a reduction of the periodicity of the intensity by increasing the amount of finishing agent or even by wetting the filaments. The person skilled in the art would not have any reason to combine this measure proposed only as an possible alternative for solving this very specific problem with the teaching of the document D1. In particular, as in the case of the document D2, no suggestion is made in the document D8 that the interlacing treatment should be substituted for the sizing treatment.

2.5 Document D3 has been considered by the Respondent as well as by the decision under appeal as being the most pertinent document which the person skilled in the art could combine with the document D1 to arrive at the claimed invention.

The Board agrees with the Respondent and the decision under appeal that the document D3 clearly teaches that the sizing step which, according to the document D1, is effected simultaneously with the drafting step by drafting the yarn in a thermostatic bath containing a sizing agent, could be substituted by a interlacing step carried out after the drafting step.

The Board also considers that this substitution may be suggested by the document D3 to the skilled person wanting to avoid the drawbacks resulting from the necessary desizing treatment in the process according to the document D1. However, the characterising feature of Claim 1 of the patent in suit, according to which the interlacing treatment is carried out on the yarn while the later is still wet, is, in the opinion of the Board neither disclosed nor suggested by the document D3, contrary to the opinion expressed by the Respondent and admitted by the decision under appeal.

The document D3 must be interpreted in the way a person skilled in the art not knowing the subject-matter of the patent in suit would understand it.

According to the document D3, the yarn to be interlaced is treated before the interlacing step with an "Appretur" in solution (normally in water). The amount of the solid agent remaining on the yarn must be in certain given weight proportion to the yarn. The "Appretur" has the usual function to control the friction between the yarn and the surfaces of the rollers and of the other yarns but it also play a role on the grade and regularity of the subsequent interlacing (see page 16 first and second paragraph of document D3). Nowhere in the disclosure of document D3, is the solvent for the "Appretur" mentioned as playing any other role as to render the "Appretur" liquid for its application with a roller. In the embodiment according to the Figure 5 of document D3, the yarn coated with the "Appretur" runs through a hot-air oven and is thus dried before being submitted to the interlacing treatment. In the other embodiment shown in Figure 7 of the document D3 and referred to in the Example 1, the yarn is first coated with "Appretur", then dried, then again coated with "Appretur" in

solution before being submitted to the interlacing treatment. However, the second coating is carried out so that a very small amount of "Appretur" (0.7% of the weight of the yarn) in a solution containing about 18 to 20% of solid "Appretur" is coated on the yarn. As rightly observed by the Appellant, such an amount of "Appretur" (0.7%) in a solution containing 18 to 20% of solid corresponds to a wetting of the yarn with about 2.8 to 3.2% of water in weight. This small quantity of water (solvent) cannot be considered as producing a wetting of the yarn in the sense of the claimed invention.

The process according to Claim 1 was therefore not obvious for a skilled person and the subject-matter of Claim 1 involves an inventive step (Article 56 EPC).

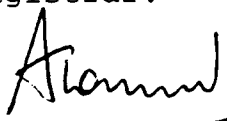
3. In view of the above, the patent can be maintained with the granted Claim 1 together with the granted dependent Claims 2 to 4 which relate to special embodiments of the invention.

### Order

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The patent is maintained unamended.

The Registrar:



A. Townend

The Chairman:



C. Payraudeau