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**DECISION**  
of 21 October 2004

**Case Number:** T 0384/00 - 3.3.7

**Application Number:** 94110503.3

**Publication Number:** 0634505

**IPC:** D01F 6/46

**Language of the proceedings:** EN

**Title of invention:**

Improved propylene polymer yarn and articles made therefrom

**Patentee:**

MONTELL NORTH AMERICA INC.

**Opponent:**

TOTAL PETROCHEMICALS RESEARCH FELUY S.A.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 84, 123

EPC R. 57a

**Keyword:**

"Amendments - allowable (yes)"

"Novelty - (yes)"

"Inventive step (yes) - problem and solution"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0384/00 - 3.3.7

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.7  
of 21 October 2004

**Appellants:** TOTAL PETROCHEMICALS RESEARCH FELUY S.A.  
(Opponents) Zone Industrielle C  
B-7181 Seneffe (Feluy) (BE)

**Representative:** Leyder, Francis  
Total Petrochemicals Research Feluy  
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B-7181 Seneffe (Feluy) (BE)

**Respondents:** MONTELL NORTH AMERICA INC.  
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patent) P.O. Box 15439  
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Delaware 19850-5439 (US)

**Representative:** Luderschmidt, Schüler & Partner GbR  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 3 February 2000  
rejecting the opposition filed against European  
patent No. 0634505 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** R. E. Teschemacher  
**Members:** G. Santavicca  
P. A. Gryczka

## Summary of Facts and Submissions

I. The grant of European patent 0 634 505, in respect of European patent application 94 110 503.3, filed on 6 July 1994 and claiming a right of priority in the U.S.A. of 12 July 1993 (US 90831), was published on 7 January 1998. The patent as granted contained the following independent claims:

"1. Polyolefin yarn capable of increased shrinkage comprising continuous strand of multiple monofilament fibers or staple fibers of propylene polymer material consisting essentially of at least 5 parts by weight, but less than 50 parts by weight of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, each propylene polymer material independently selected from the group consisting of:  
(I) homopolymers of propylene; and  
(II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from 80 to 98.5% of propylene; and from 1.5 to 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins; said copolymer preferably containing from 2 to 10% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is not present; and said terpolymer preferably containing from 0.5 to 5% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is present; and including mixtures of such copolymers and terpolymers, wherein said amounts are expressed as weight %."

"8. A polyolefin pile fabric of increased resiliency and appearance retention comprising a backing and yarn secured to said backing and extending outwardly

therefrom, said yarn comprising continuous strand of multiple monofilament fibers or staple fibers of propylene polymer material consisting essentially of at least 5 parts by weight, but less than 50 parts by weight of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, each propylene polymer material independently selected from the group consisting of:

- (I) homopolymers of propylene; and
- (II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from 80 to 98.5% of propylene; and from 1.5 to 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins; said copolymer preferably containing from 2 to 10% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is not present; and said terpolymer preferably containing from 0.5 to 5% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is present; and including mixtures of such copolymers and terpolymers, wherein said amounts are expressed as weight %."

"12. A material selected from the group consisting of woven textile, nonwoven textile and geotextile prepared from a polyolefin fiber or yarn capable of increased resiliency and shrinkage comprising propylene polymer material consisting essentially of at least 5 parts by weight, but less than 50 parts by weight of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, each propylene polymer material independently selected from the group consisting of:

- (I) homopolymers of propylene; and

(II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from 80 to 98.5% of propylene; and from 1.5 to 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins; said copolymer preferably containing from 2 to 10% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is not present; and said terpolymer preferably containing from 0.5 to 5% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is present; and including mixtures of such copolymers and terpolymers, wherein said amounts are expressed as weight %."

"18. A saxony carpet comprising a primary backing and twisted, evenly sheared, heat-set pile yarn, said yarn being in the form of individual lengths of plied yarn or tufts, each of which is attached to and projects upwardly from said backing and terminates as a cut end, said pile yarn comprises propylene polymer material consisting essentially of at least 5 parts by weight, but less than 50 parts by weight of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, each propylene polymer material independently selected from the group consisting of:

(I) homopolymers of propylene; and

(II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from about 80 to about 98.5% of propylene; and from about 1.5 to about 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins, wherein said amounts are expressed as weight %."

II. A notice of opposition was filed on 7 October 1998, in which revocation of the patent was requested on the grounds of Article 100, paragraph (a), EPC that the claimed subject-matter lacked novelty and inventive step having regard to the following documents:

F1: EP-A-0 585 814;

F2: EP-A-0 414 047;

F3: EP-A-0 451 743;

F4: US-A-3 396 071;

F5: US-A-3 268 627;

F6: US-A-4 804 577.

III. In a decision notified in writing on 3 February 2000, the Opposition Division rejected the opposition. In its decision, the Opposition Division held that:

(a) As to the content of the claims, the statement "wherein said amounts are expressed as weight%" at the end of the independent claims as well as the description, which should be used to interpret the claims in accordance with Article 69(1) EPC, made clear that the claimed weight-ratio between syndiotactic and isotactic propylene polymers was between 5:95 and less than 50:50. Furthermore, for the skilled person, the term "yarn" meant a "continuous twisted strand of fibres".

(b) Since none of F1 to F6 disclosed the combination of features defined in any of the independent claims, their subject-matter was novel.

(c) As regards inventive step, since only F2 mentioned yarns, it was the closest prior art document. The problem to be solved was to provide a yarn having

improved resilience and shrinkage and improved performance when used in carpeting, woven and nonwoven textiles and geotextiles. That problem had been solved by the yarn defined in Claim 1, as illustrated in the patent in suit. F2 concerned yarns of strong fibres predominantly based on syndiotactic polypropylene. Since F2 disclosed that polypropylene fibres based on isotactic polypropylene had insufficient strength, it could neither suggest that a yarn made of fibres predominantly based on isotactic polypropylene had increased resilience and shrinkage nor that it should be used to provide woven textiles, nonwoven textiles and geotextiles with improved performance. F3 to F6 did not supply any information filling the gap between F2 and the opposed patent; therefore, the claimed subject-matter was not obvious over the cited prior art.

IV. On 12 April 2000, the opponents (appellants) lodged an appeal against that decision; the fee for appeal was paid on the same day. In their statement setting out the grounds of appeal, received on 9 June 2000, the appellants enclosed further documents F7.1 to F7.5 and F8 to F12.

V. In their reply dated 27 December 2000, the proprietors (respondents) maintained that the subject-matter as granted, underlying the impugned decision, fulfilled the requirements of the EPC. In a letter dated 8 September 2004, the respondents enclosed two amended claims 1 as the first and second auxiliary requests.

VI. Oral proceedings were held on 21 October 2004. After the discussion of the substantive questions and of the envisaged amendments to the claims, the representative of the appellants declared that he did not intend to comment on the final text of the amendments discussed before but yet to be submitted by the respondents and that he would not take part in the rest of the oral proceedings. The oral proceedings were continued in his absence according to Rule 71(2) EPC. Before deliberation, the respondents submitted a set of amended claims 1 to 19 replacing all previous requests. The new request comprises the following independent claims:

"1. Polyolefin yarn capable of increased shrinkage comprising continuous strand of multiple monofilament fibers or staple fibers of propylene polymer material consisting essentially of 10 parts to 45 parts by weight of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, and in which blend the isotactic polymer is the predominant polymer component, each propylene polymer material independently selected from the group consisting of:

- (I) homopolymers of propylene; and
- (II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from 80 to 98.5% of propylene; and from 1.5 to 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins; said copolymer preferably containing from 2 to 10% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is not present; and said terpolymer preferably containing from 0.5 to 5% ethylene when said C<sub>4</sub>-C<sub>8</sub> alpha-olefin is present; and including mixtures of



such copolymers and terpolymers, wherein said amounts are expressed as weight %, whereby the fibers are combined in the form of a yarn, which is textured and exhibiting a crimp."

"8. A polyolefin pile fabric of increased resiliency and appearance retention comprising a backing and yarn secured to said backing and extending outwardly therefrom, said yarn being a yarn according to claim 1."

"12. A material selected from the group consisting of woven textile and geotextile prepared from a yarn according to claim 1 capable of increased resiliency and shrinkage."

"18. A saxony carpet comprising a primary backing and twisted, evenly sheared, heat-set pile yarn, said pile yarn being in the form of individual lengths of plied yarn or tufts, each of which is attached to and projects upwardly from said backing and terminates as a cut end, said pile yarn made from yarns of combined fibers of propylene polymer material consisting essentially of 10 parts to 45 parts by weight, of syndiotactic propylene polymer having a syndiotactic pentad fraction of 0.7 or more, blended with crystalline isotactic propylene polymer, and in which blend the isotactic polymer is the predominant polymer component, each propylene polymer material independently selected from the group consisting of:  
(I) homopolymers of propylene; and  
(II) random crystalline propylene copolymers, terpolymers or both, consisting essentially of from about 80 to about 98.5% of propylene; and from about

1.5 to about 20.0% of at least one comonomer selected from the group consisting of ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins, wherein said amounts are expressed as weight %, whereby the yarn of combined fibers is textured and exhibiting a crimp."

VII. The appellants argued essentially as follows:

- (a) As regards the amendment to Claim 1 that the isotactic propylene polymer (iPP) was the predominant polymer component, the acronym iPP was used in the application as filed to indicate the isotactic crystalline homopolymer of polypropylene. Hence, the passage of the application as filed which was indicated as the basis for that amendment, which merely mentioned "iPP", in fact meant a homopolymer of polypropylene. Since the crystalline isotactic propylene polymer defined in Claim 1 need not be a homopolymer, the amendment to Claim 1 added subject-matter not disclosed in the application as filed. Further, since a generalization from the examples was not possible to support that amendment to Claim 1, the amendment should not be allowed.
  
- (b) As to the amendments that the yarn was texturized and crimped, any decision on their allowability was left to the discretion of the Board. In Claim 12, the deletion of the terms "fiber" and "nonwovens" was necessary. No other objection was raised to the amendments envisaged to the other claims of the sole request discussed during the oral proceedings.

- (c) As regards the meaning of the term "yarn", the answer was to be found in the passages concerning the preparation of the yarn in the description of the patent in suit. From that description it was apparent that the yarn was a mere combination of fibres, not yet twisted. The only advantage of that yarn was its end use in carpets. In fact, once the yarn was twisted, it could not be used for making nonwovens, which typically were made up of fibres.
- (d) As regards inventive step, the closest prior art document was F2, which disclosed the preparation of a yarn made up of 14 filaments. According to the patent-in-suit, the problem to be solved was the manufacture of a polypropylene yarn capable of increased shrinkage and resilience. However, the shrinkage was not an inherent property of the material but was created through the processing conditions. Further, it was known that prior art polypropylene fibres showed a shrinkage of up to 10%. In this respect, Claim 1 did not contain any explicit minimum shrinkage distinction over the prior art fibres, in particular the polypropylene fibres of Example 1 of F2. Therefore, the problem to be solved was not the improvement of the shrinkage of the yarn over that of F2 but the manufacture of a yarn capable of increased resilience useful in carpets. Although F2 concerned polypropylene fibres of increased strength, the fibres being made of 50:50 parts of isotactic propylene polymer (iPP) and syndiotactic propylene polymer (sPP) or predominantly of sPP, it directed the attention of the skilled person to the fact that if the content of iPP was predominant then the

strength of the fibres would be insufficient. The skilled person knew that insufficient strength, i.e. less rigidity, amounted to better resilience. He was also aware of the fact that the yarn properties depended on the fibres properties, which in the present case were known. Hence, the skilled person knew what to do to obtain fibres showing more resilience. As regards texturizing and crimping, these steps did no relate to the composition and did not improve resiliency or shrinkage. Therefore, the subject-matter of Claim 1 in suit was obvious.

VIII. The respondents argued essentially as follows:

- (a) The amendments to the claims of the sole request were all based on the application as filed. In particular, the description mentioned expressly that a blend in which the iPP was the predominant polymer component was an improvement disclosed therein. Hence, the amendments to Claim 1 fulfilled the requirements of Article 123(2) EPC. The terms "fibres" and "nonwovens" objected to by the appellants were no longer in Claim 12 of the sole request.
  
- (b) The meaning of the term "yarn" was clear to the skilled person. For example, the Encyclopaedia Britannica (F7.5) defined it as "a continuous strand of fibres grouped or twisted together", which was in line with the definition in Claim 1 in suit. Further, since Claim 1 defined that the iPP was the predominant polymer component of the blend, there was no question concerning what was meant by

parts by weight, especially if reference was made to the examples.

- (c) As regards inventive step, the gist of the invention underlying the patent in suit was a yarn, which was manufactured from monofilaments or staple fibres, i.e. a typical textile yarn. These fibres were manufactured from a particular polymeric mixture, which contained less than 50 parts by weight of syndiotactic polypropylene (sPP) and isotactic polypropylene (iPP), whereby the iPP was the predominant polymer component. That composition ensured a broader thermal response, i.e. more latitude, which permitted the use of lower temperatures during the manufacturing. Particularly in connection with carpeting, the yarn made of those fibres showed resiliency, tip stability, no splitting, recovery of pile and the pile fabric showed increased appearance retention. The fibres, in view of their shrinkability, were not thin. F2 instead mentioned a yarn in which sPP was predominant, because the yarn should have a high strength. Thus, the ratio between iPP and sPP, whereby iPP was the predominant component, was a distinction from the composition in F2. If shrinkage was the sole improved property, then F2 would be relevant. However, Claim 1 contained more distinguishing features, which brought up further effects such as twist retention, resiliency, no splitting and broadening of the thermal response of the fibres, i.e. the possibility of working at a broader range of temperatures. The latter was an inherent property of the composition of the fibres and had little to do with further processing.

Further, in the combination of features as claimed, the texturing and crimping were of importance, whereas F2 neither disclosed these steps nor any use of the fibres thereof. These further effects had been achieved by the invention, as shown in the examples of the patent in suit. The appellants had not shown the contrary. Since F1 was a prior art document pursuant to Article 54(3)(4) EPC, it could not be used to assess inventive step. F3, like F2, in view of the high content of sPP in the composition of the fibres, taught away from the present invention. None of the further cited documents addressed the problem mentioned in the patent in suit or disclosed a solution corresponding to the claimed subject-matter. Therefore, the claimed subject-matter involved an inventive step.

- IX. The appellants (opponents) requested that the decision under appeal be set aside and that the European patent be revoked.
  
- X. The respondents (proprietors) requested that the appeal be dismissed and that the patent be maintained on the basis of claims 1 to 19 as submitted during the oral proceedings as the only request.

## **Reasons for the Decision**

- 1. The appeal is admissible.

2. *Amendments*

2.1 Compared to Claim 1 as granted, Claim 1 according to the sole request contains the following amendments:

(a) "10 parts to 45 parts by weights", replacing the feature "at least 5 parts by weight, but less than 50 parts by weight";

(b) "and in which blend the isotactic polymer is the predominant polymer component", added after the feature "blended with crystalline isotactic propylene polymer"; and,

(c) "whereby the fibers are combined in the form of a yarn, which is textured and exhibiting a crimp", added at the very end of Claim 1.

2.1.1 The amendment "10 parts to 45 parts by weight" has a basis in the application as filed (page 7, lines 11-12).

2.1.2 The amendment "and in which blend the isotactic polymer is the predominant polymer component" has a basis in the application as filed (page 3, lines 27-28).

The appellants' objections to this amendment are not convincing for the following reasons:

Although the passage on page 1, lines 14-15 of the application as filed mentions an isotactic crystalline homopolymer of polypropylene, the acronym in brackets (iPP) is only constituted from the initials of the words "isotactic propylene polymer", i.e. that acronym does not contain an initial "h" of "homopolymer".

Furthermore, the passage on page 3, lines 24-28 indicates that "However, Tadashi fails to recognize that other useful fiber properties can be obtained using compositions in which the sPP component is less than 50 parts by weight **or in which the iPP is the predominant polymer component; such improvements are disclosed herein** (emphasis added)".

The above passage is followed by a description of the embodiments pertaining to the invention (paragraph bridging pages 3 and 4 of the application as filed, particularly page 4, lines 3-8). According to that description, "in one embodiment the each propylene material is a homopolymer of propylene; **in another embodiment each polymer is a random crystalline copolymer or terpolymer consisting essentially of propylene with defined amounts of one or more comonomer selected from ...** (emphasis added)". It is clear from that description that the expression "each propylene material" in the above passages refers to both iPP and sPP.

Thus, independently from the actual disclosure of Tadashi (F2), in the application as filed the passage "or in which iPP is the predominant polymer component" is deliberately intended to apply not only to homopolymers of iPP and sPP but generally also to the copolymers or terpolymers of propylene as defined.

- 2.1.3 The feature "whereby the fibers are combined in the form of a yarn, which is textured and exhibiting a crimp" has a basis in the application as filed (page 10, lines 17-19).



- 2.2 Claims 8 and 12 have been amended only to the extent that a reference has been made to the features of Claim 1.
- 2.3 The above amendments aim at distinguishing the claimed subject-matter from that of F2 and are thus occasioned by the grounds of opposition (Rule 57a EPC). The amendments do not introduce any ambiguities in Claim 1 (Article 84 EPC).
- 2.4 Furthermore, the patent in suit has not been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed or extends the protection conferred (Article 123(2)(3) EPC).
- 2.5 Therefore, the sole request is admissible.

3. *Novelty*

In the impugned decision, novelty of the subject-matter as granted had been acknowledged. The appellants no longer objected to the novelty of the subject-matter of the sole request submitted during the oral proceedings. The Board has no reason to take a different position.

4. *Inventive step*

- 4.1 The patent in suit concerns an improved propylene polymer yarn and articles made therefrom.
- 4.2 More particularly, the patent in suit relates to pile fabric such as carpeting made from yarn, in which the

fibre is based on compositions comprising mixtures of isotactic and syndiotactic crystalline polypropylene and crystalline and semi-crystalline random copolymers of propylene with ethylene and C<sub>4</sub>-C<sub>8</sub> alpha-olefins (page 2, lines 3-6).

4.3 A yarn in which the fibre is made from the above propylene polymers is known from F2, acknowledged in the patent in suit (page 2, lines 40-49). F2 has been considered by the parties as the closest state of the art. The Board has no reason to choose another starting point for assessing inventive step.

4.4 F2 concerns a fibre with an average size of 10,000 - 0.1 denier formed by extruding a raw material composed mainly of a polypropylene having a syndiotactic pentad fraction of 0.7 or more (Claim 1). In particular, the raw material is a composition comprising at least 50 parts by weight of a polypropylene having a syndiotactic pentad fraction of 0.7 or more and at most 50 parts by weight of an isotactic polypropylene (Claim 4).

F2 also discloses a process for preparing a fiber comprising extruding a raw material composed mainly of a polypropylene having a syndiotactic pentad fraction of 0.7 or more (Claim 7), wherein the extruded material can be stretched (Claim 8).

5. In view of F2, the problem underlying the patent in suit is to provide a yarn capable of increased resiliency and shrinkage, particularly useful in pile fabric and carpeting (patent in suit, page 2, lines 51-52), whereby the yarn can be textured and crimped to

desired levels at lower temperatures whilst leaving a great amount of residual shrinkage (patent in suit, page 5, lines 49-51).

6. The solution to that problem is represented by the yarn having the features defined in Claim 1 as well as by the application of that yarn in the articles as defined in Claims 8, 12 and 18.
  
7. The patent in suit exemplifies a number of tests made on yarns and on carpets in which the yarns are used, whereby comparison is made with unblended iPP (Examples 1 to 6). In terms of appearance retention relating to resiliency, tuft tip retention and soiling, the yarns according to Claim 1 and the carpets made therefrom are superior to unblended iPP prior art products (see for instance Examples 3 to 6). No comparison with the yarns of F2 is exemplified in the patent-in-suit. However, since the predominant presence of sPP in the blend of F2 imparts strength, thus rigidity, it appears plausible that the advantageous effects observed for the claimed yarns could not be achieved with the yarns of F2. The appellants have submitted nothing raising any doubts in this respect. It follows from the above, that the yarn of Claim 1 and the articles of Claims 8, 12 and 18 represent effective solutions to the problem underlying the patent in suit.
  
8. It remains to be decided whether or not the claimed products were made obvious by the cited prior art.
  - 8.1 F2 aims at fibers which are excellent in strength. To achieve that objective, F2 suggests to use a blend of sPP and iPP, wherein the sPP is the predominant polymer

(summary of the invention). The end use of those fibres is not mentioned in F2.

According to F2, it is feasible to use a composition consisting of at least 50 parts by weight of a syndiotactic polypropylene and at most 50 parts by weight of an isotactic polypropylene as the fiber raw material. However, F2 mentions that if the amount of the isotactic polypropylene is more than 50 parts by weight, the strength of the resulting fiber will unpreferably be insufficient (column 3, lines 42-49).

This statement in F2 implies that, independently from the end use of the fibres having high strength, it is required that the sPP be the predominant polymer in the composition of the fibres, which requirement goes in a direction opposite to the claimed subject-matter. Furthermore, F2 does not disclose any texturing and/or crimping of the yarns made from those fibres.

Therefore, F2 cannot render obvious the subject-matter of Claim 1 according to the sole request.

- 8.2 F3 concerns a method for molding a polypropylene or a propylene copolymer having a syndiotactic structure which comprises the steps of melting, molding and then stretching a homopolymer of propylene or a copolymer of propylene and a small amount of ethylene or another alpha-olefin which has a substantially syndiotactic structure, or a mixture of the same and a small amount of polypropylene having a substantially isotactic structure (Claim 1).

F3, like F2, aims at articles from propylene having excellent physical properties, in particular improved stiffness (page 2, lines 26-28 and 35). According to F3, "a part, e.g. less than 50%, preferably 40% or less, of syndiotactic polypropylene or a propylene copolymer having a syndiotactic structure can be replaced with polypropylene having an isotactic structure". The examples of F3 which concern fibres (Examples 4, 8 and 11), neither mention any formation of a yarn, nor any texturing or crimping thereof.

Thus, also F3, like F2, is concerned with a composition wherein the substantially syndiotactic propylene polymer is predominant and does not suggest any yarn of improved resiliency and shrinkage. Therefore, F3 cannot supplement the teaching of F2 towards the features of the claimed yarn.

- 8.3 F4 concerns non-woven fabrics consisting wholly of consolidated, blended stereoregular polypropylene fibres comprising at least 10% by weight of undrawn fibres having a birefringence of less than  $20 \times 10^{-3}$  and an extension at break of more than 100% and being selected from the group consisting of melt spun stereoregular polypropylene fibres and solution spun stereoregular polypropylene fibres and up to 90% by weight of drawn, substantially fully oriented stereoregular polypropylene fibres having a birefringence above  $25 \times 10^{-3}$ , an extension at break of less than 70% and a free shrinkage at 140°C of at least 10%, said undrawn and drawn fibres having the same molecular structure and at least a proportion of the fibres having been bonded together at the fibre cross-over points as a result of the softening of the fibres

thereat (Claim 1). In particular, the non-woven fabrics can wholly comprise fibres of undrawn stereoregular polypropylene (Claim 2).

F4 only exemplifies the use of isotactic propylene polymer. Furthermore, F4 is directed to the production of a non-woven and does not disclose any yarn. In the Examples, the fibres as formed are cut and then subjected to batting. Therefore, F4 does not contain any hint either towards the claimed solution.

- 8.4 F5 concerns a composition comprising an intimate blend of from about 50 to 97% by weight of a crystalline isotactic polymer of an alpha-olefin containing from 3 to 8 carbon atoms and from about 3 to 50% by weight of a crystalline syndiotactic polymer of an alpha-olefin containing from 3 to 8 carbon atoms, said syndiotactic polymer being prepared by the polymerization of said alpha-olefin in the presence of an organometallic coordination catalyst composed of lithium alkyl hydride, titanium tetrachloride and a triaryl phosphine (Claim 1). Preferably, the alpha-olefin is propylene (Claim 2).

More preferably, the crystalline isotactic polymer of propylene is at least 15% crystalline and at least 80% insoluble in boiling n-heptane (Claim 3) and the crystalline syndiotactic polymer of propylene is at least 20% crystalline and at least 50% of this crystallinity is due to the syndiotactic structure (Claim 4).

F5 also discloses a process for preparing a non-crazing, impact resistant, crystalline polymer of an alpha-olefin comprising blending intimately from about 50 to 97% by weight of a crystalline isotactic polymer of an alpha-olefin containing from 3 to 8 carbon atoms and from about 3 to 50% by weight of a crystalline syndiotactic polymer of an alpha-olefin containing from 3 to 8 carbon atoms, said syndiotactic polymer being prepared by the polymerization of said alpha-olefin in the presence of an organometallic coordination catalyst composed of lithium alkyl hydride, titanium tetrachloride and a triaryl phosphine (Claim 6), wherein the alpha-olefin is preferably propylene (Claim 7).

F5 acknowledges that isotactic propylene polymers inherently have poor notched impact strength, i.e. they are hard and brittle (column 1, lines 17-23), and teaches, in order to improve it, to blend iPP with sPP (column 3, lines 7-10). The advantages thereof make the blends particularly suitable for applications in certain articles of commerce such as blow-molded bottles and integral hinges prepared from high impact polypropylene (column 3, lines 20-32). In the examples bars are tested (column 6, lines 25-33).

Thus, although F5 discloses blends of iPP and sPP being similar in composition to the fibres making the yarn as claimed, it neither teaches the production of yarns, nor any texturing and crimping thereof. Furthermore, since F5 goes in the opposite direction to F2 (improved impact strength vs improved strength), the skilled person would not combine F5 with F2 to arrive at the claimed features.

- 8.5 F6 concerns a soft, elastic, melt blown non-woven web comprising random, discontinuous fibers having a diameter within the range of 0.5 to 5 microns and being bound together by entanglement, said fibers being composed of a polymer blend of
- (a) from 15 wt% to 50 wt% of an elastomeric copolymer of an isoolefin and a conjugated diolefin and
  - (b) from 85 wt% to 50 wt% of a thermoplastic olefin polymer resin, wherein said polymer blend has been thermally or oxidatively degraded to reduce substantially the intrinsic viscosity of the polymer blend (Claim 1).

Since F6 concerns a nonwoven web, it has to do with fibres, which are melt-blown on a screen, and not with yarns. Furthermore, the composition of the fibres is different from that of the fibres making the yarn of the patent-in-suit. Furthermore, F6 gives no information in relation to the relative influence of iPP and sPP on yarn properties. Therefore, F6 cannot render obvious the claimed subject-matter.

- 8.6 The appellants have not shown that the claimed subject-matter is made obvious by any other disclosure, e.g. F7 to F12. In fact, since during the oral proceedings the appellants have based their obviousness objection essentially on F2, the Board considers that those further documents are less relevant than F3 to F6.
9. It follows from the above that it has not been established that the subject-matter of any of Claims 1, 8, 12 and 18 lacks an inventive step.



10. Consequently, the claims according to the sole request are considered to fulfil the requirements of the EPC.

## **Order**

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

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of claims 1 to 19 submitted as the only request during the oral proceedings and a description yet to be adapted.

The Registrar:

The Chairman:

C. Eickhoff

R. Teschemacher