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Datasheet for the decision of 29 April 2024

Case Number: T 0464/22 - 3.2.01

Application Number: 14885125.6

Publication Number: 3117724

IPC: A24D3/10, A24D3/02, A24D3/04, A24D3/06

Language of the proceedings: EN

Title of invention:
CELLULOSE ACETATE TOW BAND FOR USE IN CIGARETTE FILTERS AND CIGARETTE FILTER

Patent Proprietor:
Daicel Corporation

Opponent:
Eastman Chemical Company

Headword:

Relevant legal provisions:
EPC 1973 Art. 54, 83, 123(2), 56

Keyword:

Main request and auxiliary request 1 - Novelty (No)
Auxiliary request 2 - Added subject-matter (No)
Auxiliary request 2 - Sufficiency of disclosure (yes)
Auxiliary request 2 - Clarity (yes)
Auxiliary request 2 - Inventive step (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0464/22 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 29 April 2024

Appellant: (Patent Proprietor)	Daicel Corporation 3-1, Ofuka-cho Kita-ku Osaka-shi, Osaka 530-0011 (JP)
Representative:	Grünecker Patent- und Rechtsanwälte PartG mbB Leopoldstraße 4 80802 München (DE)
Appellant: (Opponent)	Eastman Chemical Company 200 South Wilcox Drive Kingsport, TN 37660 (US)
Representative:	Wallinger Ricker Schlotter Tostmann Patent- und Rechtsanwälte mbB Zweibrückenstraße 5-7 80331 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 20 December 2021 concerning maintenance of the European Patent No. 3117724 in amended form.**

Composition of the Board:

Chairman	G. Pricolo
Members:	S. Mangin
	P. Guntz

Summary of Facts and Submissions

I. The appeals were filed by the appellant (proprietor) and appellant (opponent) against the interlocutory decision of the opposition division finding that, on the basis of the second auxiliary request, the patent in suit (hereinafter "the patent") met the requirements of the EPC.

II. In particular, the opposition division held that for the second auxiliary request:
(1) claim 1 was clear;
(2) the subject-matter of claim 1 did not extend beyond the content of the application as filed;
(3) the subject-matter of claim 1 was novel over D2 (US 3,080,611) and involved an inventive step starting from D2.

III. Furthermore, the opposition division held that:
(1) the subject-matter of the main request did not extend beyond the content of the application as filed; and
(2) the patent, on the basis of the main request disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art; however,
(3) the subject-matter of claim 1 of the main request and the first auxiliary request was not novel over D2.

IV. Oral proceedings were held before the Board on 29 April 2024.

V. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent

be maintained as granted or, in the alternative, that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 23 as submitted with the reply to the appellant (opponent)'s statement of grounds of appeal.

VI. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked.

VII. Independent claim 1 of the main request reads as follows:

A cellulose acetate tow band (TB) for use in a cigarette filter, in which a plurality of filaments (F) extruded from a plurality of respective spinning holes (10) are bundled together and crimped, wherein
- a filament denier is not less than 5.0 denier,
- a Feret area of each of the filaments (F) is not less than 0.5, and
- a ratio S/L of the area to the peripheral length is not less than 5 µm, wherein S is the area of a cross section of each of the filaments (F) and L is the peripheral length of the cross section.

VIII. Independent claim 1 of auxiliary request 1 corresponds to claim 1 of the main request with the following additional feature:
"the filament denier is not more than 10 denier".

IX. Independent claim 1 of auxiliary request 2 corresponds to claim 1 of the main request with the following additional feature:
"wherein the tow band is obtainable by bundling the filaments together and crimping them by a crimper".

X. In the present decision, reference is further made to the following documents:
D6: "ESTRON, Acetate Tow for Cigarette Filters"
D10: "additional experiement evidence", 22 September 2021
D11: "Macromolecular Symposia 208, Cellulose Acetates: Properties and applications"
D12: Publication "A productive history, A promising future, Cellulose acetate tow offers sustainable benefits for the cigarette filter market", GAMA 2014.

Reasons for the Decision

1. Main request - Novelty over D2

The subject-matter of claim 1 is not novel over D2.

1.1 Firstly, the appellant (proprietor) argued that the following features were not implicitly disclosed in D2:
(i) - *"Feret area of each of the filaments (F) is not less than 0.5"*;
(ii) - *"a ratio S/L of the area to the peripheral length is not less than 5 µm"*.

In their view,
- most of the spinneret diameters disclosed in D2 were outside the range of 50 to 100 µm disclosed in paragraph [0046] of the patent and in example XI of D2 square-hole spinnerets were used. Therefore the general teaching of D2 was too broad to anticipate the claimed subject-matter.
- The method in accordance with claim 2 of D2 required an extrusion velocity of 1200m./m. and a pressure of about 1100 p.s.i.g. and a specific drying process with two separate air streams, resulting in filaments that

were disoriented, finely crinkled, self-crimped and had a spiral-shaped form.
However, paragraphs [0041]-[0045] of the patent disclosed that not only the diameter and the shape of the spinneret, but also other process conditions were decisive to obtain a filament having the specific Feret and ratio S/L as defined in claim 1. Claim 2 of D2 did not clearly and unambiguously disclose these process conditions. Therefore a tow band produced according to the method claim 2 did not clearly and unambiguously fall under the subject-matter of claim 1 of the main request.
- The method of claim 2 did not use the same curing temperature (temperature of the solution 80°C / air temperature 100°C) as in the patent, paragraph [0069] (temperature of the solution 50 to 60°C / air temperature 120-150°C). This difference in temperature also affected the shape of the resulting filaments.

Furthermore, D10 wherein the method of claim 2 of D2 was reproduced showed that D2 did not lead to a filament structure, wherein the parameter features relating to the Feret area and the S/L ratio of claim 1 of the main request were both fulfilled. D10 proved that the Feret area value of a tow band in accordance with claim 2 of D2 was "0.49", which was outside of the range defined in claim 1 of the main request, the difference between "0.49" and "0.5" as claimed constituting a significant difference. The error margin of the results for the parameter "Feret area" could not be considered so high that "0.49" was to be considered as meeting the claimed range.

Secondly, the appellant (proprietor) argued that D2 did not disclose that:

(iii) - *"a plurality of filaments (F) (...) are bundled together and crimped"*.

The term "crimping" in claim 1 referred to a mechanical crimping by a crimper. This interpretation was confirmed by:
- D11 which stipulated that the uncrimped tow needed to be crimped by a mechanical crimper by being pressed by two feed rolls and introduced into a stuffer box.
- D2, column 1, lines 32-35, which disclosed that a mechanical crimping was the usual procedure in the art.
- D12 (page 4) which disclosed that prior to crimping the filaments were combined to form a cable and that the cable was subsequently crimped in a stuffer box to obtain the filter tow structure.

The mechanical crimping that took place after the filaments were bundled together in accordance with claim 1 of the patent led to uniform crimps in the entire tow width direction and secondary crimps which could not be achieved by the self-crimped tow band as referred to in claim 2 of D2.

Furthermore D2 did not disclose that the filaments were "bundled together" before being "crimped" as defined in claim 1. In D2, the filaments were only shrunk while being dried independently in the spinning cabinet.

1.2 The Board is not convinced by the arguments of the appellant (proprietor).

1.2.1 In relation to features (i) and (ii), document D10, referring to experiments of the appellant (proprietor) replicating the method of claim 2 of document D2, indicates that the resulting tow band satisfies the

Feret area and the ratio S/L defined in claim 1 of the main request.

Considering the inaccuracies associated with the calculation of the Feret area, a Feret area of 0,49 (reference is made to the table on page 3 of D10) is to be rounded to 0.5 and therefore anticipates the Feret area of not less than 0.5 defined in claim 1. Indeed, as acknowledged by the opposition division, values obtained from performing the methods for determining the Feret area and S/L ratio as described in the opposed patent are sensitive to how the images are processed and a degree of subjectivity is necessarily involved (see point 25 on page 6 of the appealed decision).

The patent proprietor has deliberately expressed in claim 1 the limit range of the Feret area with one decimal after the comma. The skilled person would appreciate that this precision reflects the accuracy achievable when measuring the "Feret area". Consequently, the limit 0.5 in claim 1 accounts for the decimal number resulting from rounding up. When reproducing the method described in claim 2, the resulting Feret area is 0.49 according to D10. Following standard mathematical rules for rounding off, this value becomes 0.5, which falls within the range covered by claim 1 of the main request.

1.2.2 Regarding feature (iii), claim 1 is directed to a product claim (i.e. not a process claim). The expression according to which "a plurality of filaments (F) (...) are bundled together and crimped" defines properties of the end product. Claim 1 does not specify whether the plurality of filaments are first bundled and then crimped or the other way around and does not

define the process used to crimp the filaments. In particular, the use of a crimper or the way it is crimped, i.e. mechanically, is not specified in claim 1. Therefore, claim 1 encompasses filaments that are self-crimped and then bundled as in D2.

2. First auxiliary request

Claim 1 of the first auxiliary request corresponds to claim 1 of the main request with the following additional feature:
"the filament denier is not more than 10 denier".

During oral proceedings, the parties referred to their written submissions. The Board has no reason to deviate from its preliminary opinion as stated in their communication pursuant to Article 15(1) RPBA.

The appellant (opponent) submitted that the arguments set forth in connection with the main request applied to the first auxiliary request.

The Board comes to the same conclusion as the opposition division, namely that the subject-matter of claim 1 is not novel over D2. Indeed, D2 specifies on column 2, lines 24-25 that:
"The yarn of our invention is characterized by such a typically low denier of less than about 10 per filament".

3. Second auxiliary request

Claim 1 of the second auxiliary request corresponds to claim 1 of main request with the following additional feature:

"wherein the tow band is obtainable by bundling the filaments together and crimping them by a crimper".

3.1 Clarity - Article 84 EPC

During oral proceedings, both parties made reference to their written submissions. The Board reaffirms its preliminary opinion as expressed in its communication pursuant to Article 15(1) RPBA that claim 1 is clear.

3.1.1 The appellant (opponent) argued that claim 1 according to the second auxiliary request did not comply with the provisions of Article 84 EPC, since it was not clear from the wording of claim 1 if the filaments of the tow band had been bundled together and crimped once or twice.

3.1.2 The Board is not convinced by the argument of the appellant (opponent) and follows the opinion of the opposition division. The skilled person, with a mind willing to understand, recognises that the added feature specifies the previous stated feature according to which "the plurality of filaments (...) are bundled together and crimped" and does not add an additional crimping to the filaments.

3.2 Insufficiency of disclosure - Article 100(b) EPC in conjunction with Article 83 EPC

During oral proceedings, the parties referred to their written submissions. The Board maintains its opinion that the invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art as expressed in its communication under Article 15(1) RPBA.

3.2.1 The appellant (opponent) submitted that the combination of the following two aspects amounted to an insufficiency of disclosure:
(i) the lack of sufficient detail with respect to the determination of the "Feret area" and "S/L ratio"; the result of the parameters depended highly on the selection of the cross section and the image processing parameters used; and
(ii) the lack of disclosure and of examples to put into practice the invention across the whole scope of claim 1; in particular the lack of information regarding the flow rate of drying air and the spinning speed did not enable the skilled person to obtain a cellulose acetate tow band according to claim 1.

3.2.2 The Board notes that the determination of the "Feret area" being dependent on the image processing and the parallelogram's construction will lead to inaccurate/ unprecise results. However, the Board concurs with the opposition division that this is rather an issue under Article 84 EPC than under Article 83 EPC. The "Feret area" and the "S/L ratio" are not ill-defined to such an extent that they cannot be determined by the skilled person.

Furthermore the patent discloses enough information and in particular example 1 to enable the skilled person to carry out the invention. The skilled person using the information disclosed in the patent with their common general knowledge and with a limited amount of trial and error, if necessary, will be able to put the invention into practice.

3.3 Added subject-matter - Article 123(2) EPC

The subject-matter of claim 1 does not extend beyond the content of the application as originally filed.

3.3.1 The appellant (opponent) argued that the amendments made to claim 1 of the second auxiliary request resulted in an unallowable intermediate generalisation of the teaching of paragraph [0039] and the examples of the originally filed disclosure.

Claim 1 did not specify that the bundling of the filaments together took place before crimping them by a crimper. However, paragraph [0049] and the examples specified that bundling took place before crimping. The order of the steps being structurally and functionally linked to the bundling and the crimping of the filaments, the amendment resulted in an unallowable intermediate generalisation.

The godet rollers were also disclosed as mandatory means in the originally filed disclosure for crimping with a crimper and thus specifying the crimper without the godet rollers resulted in an unallowable intermediate generalisation.

In claim 1 of the second auxiliary request, the crimping of the fibers was now defined/restricted to a crimping by a crimper, whereas the bundling of the fibers was still left "open", i.e. not defined/related to any particular technical means or methods.

3.3.2 The Board disagrees with the arguments put forth by the appellant (opponent). The added feature in claim 1 should be interpreted such that that the bundling of the filaments together occurs prior to their crimping by a crimper.

Indeed, the added product-by-process feature *"wherein the tow band is obtainable by bundling the filaments together and crimping them by a crimper"* not only specifies that the crimping is being carried out by a crimper (self-crimped filament being excluded from claim 1) but also that the crimping is carried out after bundling the filament together.
The use of the term "them" in the second part of the sentence refers to the filaments bundled together. The skilled person understands that if the crimping is done via a crimper, the filaments are not individually crimped (as it is the case in D2 when the filaments are self-crimped) but it is the filaments bundled together that are passed in the crimper. Reference is made to page 4 of D12 and pages 270-271 of D11, which teach that when using a crimper for crimping filaments, the filaments are first bundled together and then passed in the crimper.

As to the omission of the Godet rollers in claim 1, disclosed in paragraph [0039] and figure 1 of the application, the Board follows the opinion of the opposition division that it does not lead to added subject-matter. In particular, the skilled person would know that the filaments need to be fed to the crimper. The use of Godet Rollers is a possibility, but is not the only one and is not inextricably linked to the crimping of the filament by a crimper.

3.4 Inventive step - Article 56 EPC

The subject-matter of claim 1 involves an inventive step starting from D2 in combination with common general knowledge proven by D6 and D11.

During oral proceedings, the parties referred to their written submissions. The Board confirms its preliminary opinion submitted with its communication under Article 15(1) RPBA.

The difference between the subject-matter of claim 1 and D2 lies in *"the tow band [being] obtained by bundling the filaments together and crimping them in a crimper".* This is not contested by the parties.

3.4.1 The appellant (opponent) argued that starting from D2, the problem to be solved may be regarded as to provide an alternative tow band. The skilled person would obviously implement a crimper as an alternative to the self-crimping disclosed in the method of claim 2 of D2. Claim 1 would thus constitute a "non-inventive alternative".

D2 did not teach the skilled person away from using mechanical crimping. A fair and objective reading of D2 revealed that D2 taught a method to obtain surface roughened, crimped fibers by way of self-crimping as an alternative to the state of the art of mechanical crimping. There was no disclosure within the whole document of D2 describing mechanical crimping as disadvantageous and thus as not considerable.

The teaching of D2 in fact taught the skilled person three alternatives for obtaining surface-roughened, crimped fibers: 1. Via the self-crimping process of D2, 2. Via mechanical crimping as known from the prior art and 3. Via a combination of both. The skilled person did not get any pointer that mechanical crimping must be avoided nor did the skilled person get a pointer to the opposite, namely that mechanical crimping must be done. The skilled person was left with the situation

that D2 was formulated neutral, and that the skilled person could decide which alternative was the one which fitted the skilled persons needs best.

While D2 itself discussed the possibility to use mechanical crimping, this process was well established in the art and in fact belonged to the common general knowledge and common practice in the art. In this regard reference was made to the cited documents D6 and D11.

3.4.2 The Board is not convinced by the arguments of the appellant (opponent).

The appellant (proprietor) argued that the objective technical problem was the provision of an improved cellulose acetate tow band. However, even taking the broader technical problem defined by the appellant (opponent), namely the provision of an alternative cellulose acetate tow band, starting from the teaching of D2, the skilled person would not implement a crimper.
Indeed, D2 teaches the skilled person away from implementing a crimper to crimp the filaments as stated by the appellant (proprietor) and the opposition division (reference is made to points 77-83 of the appealed decision).
D2 discusses the disadvantages of mechanical crimping, when compared to a self-crimping process as employed in D2, namely, the fact that only an "artificial rather than a true crinkled appearance" is achieved, and the necessary "addition of bonding agents or plasticizers tended to return a considerable amount of luster" (reference is made to column 1, lines 28-47 of D2).

Therefore, although mechanical crimping is a well-known method in the field of the invention, the skilled person starting from D2 would not change the self-crimping by a mechanical crimping.

Order

For these reasons it is decided that:

The appeals are dismissed

The Registrar: The Chairman:

A. Chavinier G. Pricolo

Decision electronically authenticated