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**Datasheet for the decision
of 10 November 2025**

Case Number: T 1495/23 - 3.2.04

Application Number: 18875018.6

Publication Number: 3662770

IPC: A24F47/00, A24D3/10

Language of the proceedings: EN

Title of invention:

ELECTRONIC CIGARETTE TIP TOW BAND, ELECTRONIC CIGARETTE TIP,
METHOD FOR PRODUCING ELECTRONIC CIGARETTE TIP TOW BAND, AND
METHOD FOR PRODUCING ELECTRONIC CIGARETTE TIP

Patent Proprietor:

Daicel Corporation

Opponents:

Celanese International Corporation
Eastman Chemical Company
Cerdia International GmbH

Headword:

Relevant legal provisions:

EPC Art. 100(b)
RPBA 2020 Art. 12(4), 12(6)

Keyword:

Sufficiency of disclosure - (no)

Decisions cited:

Catchword:



Beschwerdekammern
Boards of Appeal
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Case Number: T 1495/23 - 3.2.04

D E C I S I O N
of Technical Board of Appeal 3.2.04
of 10 November 2025

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 13 June 2023
revoking European patent No. 3662770 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman A. Pieracci
Members: J. Wright
 C. Heath

Summary of Facts and Submissions

I. The appeal was filed by the patent proprietor against the decision of the opposition division to revoke the patent in suit.

During the opposition proceedings, the opponents had raised the ground for opposition under Article 100(b) EPC. The opposition division decided that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

II. In preparation for oral proceedings, the Board issued a communication setting out its provisional opinion on the relevant matters. Oral proceedings before the Board were held on 10 November 2025.

III. The appellant-proprietor requests that the decision under appeal be set aside and that the patent be maintained as granted, in the alternative that the decision under appeal be set aside and that the patent be maintained according to one of auxiliary requests 1 to 4 all filed with the grounds of appeal on 18 October 2023.

The respondent-opponents 1, 2 and 3 request that the proprietor's appeal be dismissed.

IV. Claim 1 of the main request and auxiliary request 1 reads as follows (with feature references added by the Board in square brackets):

"[D1] A tow band for electronic cigarette tip,
[D1a] the tow band of cellulose acetate

[D1b] provided by uniting and crimping a plurality of filaments into a bundle,
[D2] wherein a total denier is set to a value in a range of 10000 to 40000 (inclusive) and
[D3] a filament denier is set to a value in a range of 6.0 to 20.0 (inclusive), and
[D4] where the total denier is denoted by TD and a breaking strength of the tow band is denoted by F, a ratio F/TD is set to a value of 0.0015N/denier or more".

Claim 1 of auxiliary request 2 reads as for the main request except that it adds the following wording to the end of the claim: "and 0.01N/denier or less."

Claim 1 of auxiliary request 3 reads as for the main request except that the feature:

"a total denier is set to a value in a range of 10000 to 40000 (inclusive) and a filament denier is set to a value in a range of 6.0 to 20.0 (inclusive)" is replaced by the feature:

"a total denier is set to a value in a range of 20000 to 40000 (inclusive) and a filament denier is set to a value in a range of 8.0 to 20.0 (inclusive)"

Claim 1 of auxiliary request 4 reads as for auxiliary request 3 except that at the end of the claim the following wording is added: "and 0.01N/denier or less."

V. The arguments of the parties relevant to the decision are set out below in the reasons for the decision.

Reasons for the Decision

1. The appeal is admissible.
2. Background

The patent relates to a tow band for electronic cigarette tip (see published patent specification, paragraph [0001] and claim 1). According to the patent specification (see paragraphs [0016] to [0018]) filaments used in tips for electronic cigarettes have a relatively large filament denier (FD). Such filaments are prone to break during manufacturing, resulting in fragments being in the tow, called "fly".

3. Main request, claim 1, sufficiency of disclosure
 - 3.1 In the present case the Board considers that the skilled person is a mechanical engineer specialising in making tow for electronic cigarette tips. In the Board's view, they would know how to produce cellulose acetate filaments with a filament denier value (FD) lying within the claimed range. Moreover, they would know how to produce a tow band from those filaments by uniting and crimping a plurality of filaments. The skilled person can also achieve the claimed total denier (TD) simply by deciding how many individual filaments are used to make the band. Therefore, the Board has no doubt that the skilled person knows how to make a crimped tow band with the claimed filament denier and total denier according to claim features D1, D1a, D1b, D2 and D3. The question of sufficiency of disclosure therefore turns on whether the skilled person would know how to achieve claim feature D4: "where the total denier is denoted by TD and a breaking

strength of the tow band is denoted by F , a ratio F/TD is set to a value of 0.0015N/denier or more."

- 3.2 The opposition division considered that the patent did not give the skilled person sufficient information to achieve feature D4 and concluded that the invention according to claim 1 was not sufficiently disclosed (see its decision, section 3.3).
- 3.3 As explained in the patent specification, paragraphs [0036] to [0050] with figure 1 and 2, a plurality of filaments 61 are converged by guide pins 7 and 8 into yarns 62 (paragraph [0042]). These form an end which is a flat filament assembly 63 (paragraph [0044]). Tow band 64 is produced from the assembly by crimping it in a crimping device 9 having a pair of nip rolls 16 which press the end 63 before it enters a stuffing box 18.
- 3.4 The patent explains (see the specification, paragraph [0061]) that fragmentation of the filaments (fly) occurs when crimping a tow band with large filament denier, which requires a higher crimp pressure. This may also reduce the tensile strength of the filament.
- 3.5 In its appeal grounds (page 11) the proprietor explained that: "Tow bands containing cracked filaments have a weaker breaking strength F . Since the breaking strength F of the tow band depends on the value of TD , the degree of cracked filaments can be identified by the ratio F/TD . Therefore, in accordance with the claimed invention, the ratio F/TD is set as being 0.0015N/denier or more (cf. granted claim 1 and also paragraph [0020] of the opposed patent)".

- 3.6 The Board agrees with the appellant-proprietor that the parameter F/TD can be measured - the skilled person can simply determine the tensile breaking strength of a piece of tow band they have made, as explained in paragraph [0068] of the patent, and divide the result by the total denier which they can also measure.
- 3.7 The Board also has no reason to doubt that the degree of cracked filaments is related to the ratio of F/TD , since these cracked filaments are said to reduce breaking strength. However, the relationship between cracked filaments and the ratio F/TD the proprietor explains (cracked filaments have a weaker breaking strength F) is a one directional one: Filament cracking causes a reduction in breaking strength F and thus in the ratio F/TD for the tow band, which can be observed. However, the Board holds that the idea that the skilled person is in a position to adjust the F/TD ratio for the tow band they make such that it lies within the claimed range, misattributes adjustability to the tow band's F/TD ratio whereas it is actually only an observable property thereof. In other words, the Board considers that however usual it may be to observe a tow's breaking strength and calculate its F/TD , this would not be a usual parameter the skilled person would know how to adjust from the information provided in the patent and their common general knowledge when carrying out the invention.
- 3.8 If the skilled person were to be able to carry out the invention, they would have to know how not to exceed the degree of cracked filaments associated with the claimed minimum ratio of F/TD . In the Board's view, the patent does not give sufficient information for the skilled person to be able to do this.

- 3.9 In a section "Technical Problem" (see paragraph [0018]), the patent specification explains that an object of the invention is to solve the problem of decreased manufacturing efficiency and tip quality. In the immediately following section "Solution to Problem" starting on page 3 (see paragraphs [0019] and [0020]) the solution is to provide a cellulose acetate tow band with, amongst other parameters, a breaking strength divided by total denier (F/TD) set to a value of 0.0015N/denier or more. The next paragraph [0020] explains: "According to the above configuration, the strength per filament can be improved by setting the ratio F/TD to the above value while setting the TD and FD [filament denier] of the tow band to desired values within the above ranges. As a result [...] it is possible to prevent a filament from being fragmented even if an external force is applied to the filament".
- 3.10 Here the skilled person is given no information as to how they might be able to set, in other words adjust, the ratio of F/TD, it is merely stated that the skilled person should do so.
- 3.11 In its appeal grounds (pages 11 and 12), the proprietor has explained two ways to reduce excessive external force being applied to the tow band end during crimping, and thus preventing filaments from cracking. Implementing these will, so it argues, result in achieving an F/TD ratio of at least the claimed minimum value. These two ways are:
- (1) Reducing the excessive external force to the end during crimping by reducing the thickness of the end; and
 - (2) Reducing the dispersion of the thickness of the end so that strong pressure is not applied to narrow areas

with locally large thickness differences. It also prevents the thickness from thinning in small areas and becoming a hole.

3.12 The Board agrees with the appellant-proprietor that the patent (see specification, paragraphs [0064] to [0067] and [0070] with figure 2) explains how the skilled person can carry out the first of these: Namely, by making sure a ratio of total Denier (TD) to the crimping roll width D (TD/D) falls within a preferred or more preferred range as set out in paragraphs [0024] and [0028]. According to the patent (paragraphs [0064], [0065] and [0069]) this increases alignment uniformity of the filaments in the crimping roll-width direction and prevents overlaps.

3.13 However, the patent gives no information as to how setting TD/D might allow the skilled person to adjust the value of F/TD. In other words, the skilled person would not know from the patent what effect TD/D might have on F/TD.

3.14 Turning now to the second proposed way of reducing excessive external force being applied to the tow band end during crimping: reducing thickness dispersion [irregularity] - the appellant-proprietor has argued (appeal grounds, pages 14 to 18) that this is achieved by the combination of monitoring the thickness of the filament assembly and performing an alignment by adjusting the guide pins 7 and 8 (see specification, paragraphs [0051] to [0056], [0059], [0071] and [0072] with figure 1).

3.15 The Board does not doubt that the skilled person can monitor thickness of the tow band before it enters the crimping rolls, as explained in paragraphs [0051] to

[0054] with reference to figure 1. They would also be able to decide when the thickness dimension was no longer within some reference range and use this as a prompt to perform an alignment step by adjusting the pins 7 and 8 which guide the plurality of filaments making up the tow band (cf. patent specification, paragraphs [0059] and [0071] with figure 1).

- 3.16 However, the patent is silent as to how thickness variation might affect breaking strength F or breaking strength per total denier (F/TD). In other words how the acceptable thickness reference range should be chosen in order to achieve the claimed range of F/TD . At most the patent explains (paragraphs [0055] and [0056]) that the allowable range of thickness can be set "as appropriate" or to a value "in which an occurrence of a hole in the filament assembly can be visually recognized by the naked eyes, for example, in planar view of the filament assembly", which the Board understands should have meant the allowable thickness range should be set to a value where *no* such holes appear, as the appellant-proprietor has explained.
- 3.17 That said, the non-occurrence of holes in the filament assembly is not explained in the patent to be associated with any particular breaking strength or breaking strength per total denier (F/TD). Therefore, this information would not allow the skilled person to select a thickness range suitable for ensuring they would achieve at least the minimum F/TD value defined in the claim.
- 3.18 In this regard, the appellant-proprietor has explained (see its appeal grounds, paragraph bridging pages 26 and 27) that: "it is not necessary to [disclose in the patent] absolute values for [specific reference range

for the thickness to be monitored and crimping force] since said ranges vary with the used equipment/device for manufacturing, the used starting material, etc".

3.19 At the oral proceedings before the Board, the appellant-proprietor explained that although the invention was only concerned with cellulose acetate tow band material, the "starting material" referred to in this part of the appeal grounds was intended to mean the filament denier being used, which can vary within the claimed range. The appellant also explained that higher filament denier values require more careful monitoring to achieve the claimed F/TD, as could be seen by comparing examples 2 and 4 in table 1 on page 11 of the patent specification. In the Board's view, at most this confirms that the skilled person cannot know from the patent what thickness tolerance to choose to trigger an adjustment of the pins 7 and 8 in order to align the filament assembly and thus adjust the claimed F/TD to be in the range claimed. Not only does the patent not explain any such relationship but, according to the appellant, it would furthermore depend on the denier of the filament being used in a way which has likewise not been disclosed in the patent.

3.20 Given the gaps in the patent disclosure explained above, contrary to how the appellant-proprietor has argued, the Board holds that it would require much more than a reasonable amount of trial and error for the skilled person to adjust the F/TD of a tow band to be within the claimed range. Indeed, they would simply not know how to go about making such an adjustment without undue burden.

3.21 Nor is the Board convinced that table 1 on page 11 of the patent specification might fill these gaps. It shows four comparative examples of tow band where the claimed F/TD parameter is not correctly adjusted and four examples (of the invention) where a value of F/TD falling within the claimed range has been achieved. All the examples and comparative examples have filament denier (FD) and total denier (TD) values within the ranges defined in claim 1. Similarly, for all the examples and comparative examples the TD/D ratio, where D is the width of the crimping roll, have values within the broadest range of TD/D the patent teaches to use (specification, paragraph [0024]). Yet, the comparative examples do not result in tow having an F/TD ratio value as claimed. Therefore, the Board sees no pointer in these parameters as to how, in examples 1 to 4, the skilled person might be able to successfully adjust F/TD to within the claimed range.

3.21.1 The table also documents the generation of "fly", classifying it as large or small. However, since the patent (see paragraph [0020]) presents fragmentation (fly) as a *result* of having set the ratio of F/TD to within the claimed threshold range, any correlation between low fly and an acceptable F/TD value does not provide more information than what can be gleaned from the rest of the description as to how to the skilled person might be able to adjust the F/TD ratio. As to the presence of a monitoring and aligning step, said to be complete in the inventions examples 1 to 4 but absent or incomplete in the comparative examples, without information in the table as to any monitoring and aligning parameters the mere fact that it takes place in the examples adds no additional technical guidance for the skilled person as to how to adjust the F/TD ratio to lie within the range claimed.

3.21.2 Similarly, the absence of holes in the filament assembly of all four examples of the invention might at most suggest that this was a necessary condition for achieving an F/TD ratio within the claimed range, but it does not tell the skilled person how this might affect the F/TD ratio. Moreover, since such holes are also absent in half the comparative examples, avoiding them is certainly not a sufficient condition for the skilled person to be able to adjust F/TD to within the claimed range.

3.21.3 Finally, the observation that examples 1 to 4 which achieve an F/TD value as claimed, were all subjected to monitoring/aligning, have small fly and no holes, does not explain how the F/TD value has been successfully arrived at in these examples. This is because neither the table nor the rest of the description explain how monitoring/aligning the tow band, observing there to be no holes and having no more than small amounts of fly, whether taken individually or together, might have contributed to achieving the F/TD values observed.

3.22 For all these reasons, the Board finds that the invention according to claim 1 is not sufficiently disclosed. This is in agreement with the opposition division's finding on the matter (decision, reasons, 3.3.4). Therefore, the main request is not allowable.

4. Auxiliary request 1, claim 1, sufficiency of disclosure

Claim 1 of auxiliary request 1 is the same as claim 1 of the main request. Therefore, without prejudice to the question of admittance of this request, it is not allowable for the same reasons as apply to the main request. Therefore, the request fails.

5. Auxiliary requests 2 to 4

In its communication, section 9, the Board explained why it did not intend to admit these requests into the appeal proceedings. The Board wrote the following:

"9. Auxiliary requests 2 to 4

9.1 In its appeal grounds (pages 3 to 5), the proprietor explains that claims according to auxiliary requests 2 to 4 were already on file in the opposition proceedings and so they are not an amendment to the present case. The Board disagrees. In particular, these aspects of the proprietor's appeal case are not directed to requests on which the appealed decision was based (Article 12(2) RPBA).

9.2 According to the decision (Summary of Facts and Submissions, pages 3-5) and the undisputed minutes (see points 9, 17, 24 and 34), the appellant-proprietor submitted different auxiliary requests 1 to 4 at the oral proceedings in opposition. After these had been discussed, the proprietor had no more requests (minutes, point 40). Therefore, the proprietor's procedural actions led to present auxiliary requests 2 to 4 not being presented to the opposition division for a decision.

9.3 By presenting present auxiliary requests 2 to 4 for a decision for the first time in appeal, the appellant-proprietor has thus amended its case which is not commensurate with the appeal proceedings' primary purpose, namely to review the decision under appeal (Article 12(2) RPBA). In the Board's view, had the appellant-proprietor wished to have these requests

decided upon at the appeal stage it should have presented them for a decision in the opposition proceedings. For these reasons, the Board does not intend to admit them into the appeal proceedings, Articles 12(4) and 12(6) second sentence RPBA."

- 5.1 Neither in writing nor at the oral proceedings did the parties make any comments on this aspect of the communication. Having reviewed it in a deliberation at the oral proceedings, the Board saw no reason to deviate from its preliminary opinion. Therefore, the Board decided not to admit auxiliary requests 2 to 4 into the appeal proceedings.

6. Since the appellant-proprietor's main and first auxiliary requests are not allowable and its lower ranked requests are not admitted into the appeal proceedings, the Board must dismiss the appeal.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



G. Magouliotis

A. Pieracci

Decision electronically authenticated