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# Datasheet for the decision of 17 March 2009

**Case Number:** T 0547/07 - 3.2.05

**Application Number:** 03075169.7

**Publication Number:** 1304211

**IPC:** B29C 70/36

**Language of the proceedings:** EN

**Title of invention:**
Production of large composite structures

**Patentee:**
TPI Technology, Inc.

**Opponents:**
LM Glasfiber A/S
Diab AB

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 54, 56

**Relevant legal provisions (EPC 1973):**
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**Keyword:**
"Admissibility of late filed document (no)"
"Novelty (yes)"
"Inventive step (yes)"

**Decisions cited:**
-

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0547/07 - 3.2.05

# D E C I S I O N
**of the Technical Board of Appeal 3.2.05**
**of 17 March 2009**

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**Decision under appeal:** **Interlocutory decision of the Opposition Division of the European Patent Office posted 6 February 2007 concerning maintenance of European patent No. 1304211 in amended form.**

**Composition of the Board:**

**Chairman:** W. Zellhuber
**Members:** P. Michel
C. Rennie-Smith

## Summary of Facts and Submissions

I. Appellant I (opponent 01), appellant II (opponent 02) and appellant III (patent proprietor), lodged appeals against the interlocutory decision of the Opposition Division maintaining European patent No. 1 304 211 in amended form.

In the decision under appeal, it was held that the subject-matter of claim 1 of the main request of appellant I was not new, but that auxiliary request 1 was allowable.

II. Oral Proceedings were held before the Board of Appeal on 17 March 2009.

Appellants I and II requested that the decision under appeal be set aside and that the European patent No. 1 304 211 be revoked.

Appellant III requested, as main request, that the appeals of appellants I and II be dismissed, or that the decision under appeal be set aside and that the patent be maintained on the basis of the sets of claims filed as first to fifth auxiliary requests on 28 December 2007.

III. Claim 1 of the main request (i.e. claim 1 as maintained by the Opposition Division) reads as follows:

"1. A unitary composite structure comprising:
a core (12) having a peripheral surface (16) and a feeder channel (14) formed to lie across at least a

portion of said peripheral surface (16) of said core (12);
a resin distribution network (18;64);
a fiber material (20) covering said core (12) and said feeder channel (14) in said core peripheral surface (16);
a cured resin impregnating said fiber material (20), said feeder channel (14), and said resin distribution network (18,64),
wherein
the resin distribution network (18;64) is adjacent said core peripheral surface (16) and said feeder channel (14), and wherein the fiber material (20) covers said resin distribution network,
characterised in that
the resin distribution network comprises a network of grooves (18) formed in said surface (16) of said core extending from said feeder channel, said grooves having a smaller cross-sectional area than said feeder channel."

IV. The following documents are referred to in the present decision:

D2: WO-A-89/00495
D3: EP-A-0 517 416
D4: US-A-4,902,215
D5: US-A-5,316,462
D7: US-A-5,304,339
D11: JP-A-1-316235

V. The arguments of appellants I and II in the written and oral proceedings can be summarised as follows:

Document D11 was filed as soon as the translation was available.

As shown in Figures 5a and 5b, document D11 discloses a core having grooves of different cross-sectional areas, the circumferential grooves being deeper than the longitudinal grooves and having the same width. The circumferential grooves thus have a greater cross-section and form feeder channels as required by claim 1 of the patent in suit. Document D11 thus discloses a structure having all the features of claim 1 and is thus prima facie relevant. It is noted that claim 1 of the patent in suit is directed to a structure per se, so that features relating to the process of manufacture should be ignored.

Document D11 should accordingly be admitted into the proceedings.

Document D7 discloses, with reference to column 10, lines 31 to 37 and Figures 5 and 6, a core which may be used in place of, or in addition to, the core as shown in Figure 1. In such a core, the channels 31, 32 have a smaller cross-sectional area than that of the feeder channels connected to the openings 6 of the cores.

It is generally known that fluid distribution systems, such as water supply or blood circulation, have a pipe of large cross-section connected to a source, from which pipes of smaller cross-section extend. It is thus

implicit that the channels have such a dimensional relationship.

The subject-matter of claim 1 lacks thus novelty in view of the disclosure of document D7.

Insofar as the subject-matter of claim 1 is regarded as being new with respect to the disclosure of document D7, it lacks an inventive step.

There are a limited number of alternatives for supplying resin to the grooves of the core of figures 5 and 6 of document D7. The use of a channel in the surface of the core is merely an arbitrary choice. Having made this arbitrary choice, it is obvious that the feeder channels should have a larger cross-section than the distribution channels in order to obtain a rapid distribution of resin.

The closest prior art may alternatively be regarded as being that of Figure 3 of document D2, in which a gallery 36, acting as a feeder channel, has a larger cross-section than the galleries 38, which act as distribution channels. Document D2 thus discloses a hierarchical distribution system. As stated at page 11, lines 9 to 24, the galleries could be at the surface of the core.

The subject-matter of claim 1 is distinguished from this known composite structure solely in that the grooves in the core have a smaller cross-section than the feeder channel.

The problem to be solved is how to efficiently fill the grooves of the resin distribution network with resin.

In order to work efficiently, the supply channel must have a larger cross-section than the grooves. In addition, as disclosed in document D3 at column 11, lines 11 to 15, two or more channels of varying cross-section may be provided. Such a construction is also suggested by documents D4 and D5.

The subject-matter of claim 1 thus does not involve an inventive step.

VI. The arguments of appellant III in the written and oral proceedings can be summarised as follows:

Document D11 was late filed and should not be admitted into the proceedings. Whilst a translation of the Japanese document has been provided, it is not possible to verify that the translation is accurate. The document was only introduced after it had proved impossible to show that document D10 had been published before the priority date of the patent in suit.

In Figure 5b of document D11, there is no hatching to indicate that the inner square is a section. It is further not clear that the section C-C is taken at the location of the circumferential groove. The inner square may thus be a reinforcing element of the core, and there is no disclosure of the depth of the circumferential groove. In addition, Figure 5b shows only a single top and bottom groove, whereas Figure 5a shows two such grooves.

The structure of document D11 is formed in a rigid mould, so that resin enters the grooves from all directions and there is no feeder channel.

Document D7 discloses two types of cores which, as stated at column 10, lines 31 to 37, may be used together. There is, however, no disclosure of a hybrid core combining features of the two types of core. The channels of the embodiment of Figures 5 and 6 could be supplied individually or an external distribution channel could be provided.

The subject-matter of claim 1 is thus new.

The closest prior art is the embodiment shown in Figures 5 and 6 of document D7.

There is no motivation for the person skilled in the art to combine features of the cores of Figures 5 and 6 with features of the cores shown in Figures 1 and 3a of document D7. Strips 8 are applied onto the fibre layer and arranged transversely of the cores as shown in Figure 4 and have a passageway 9 as shown in Figure 3b. The strips thus ensure rapid flow transversely of the cores. There is accordingly no motivation to improve flow in the transverse direction. Any provision of additional channels would disrupt the desired pattern of channels as described at column 9, lines 49 to 53 of document D7.

If document D2 was to be regarded as the closest prior art, there would still be no motivation to provide channels of differing cross-sections as specified in claim 1. Neither document D2 nor document D7 discloses

the claimed combination of a feeder channel and a resin distribution network.

Document D3 is concerned with a moulding process using a rigid mould. None of documents D3, D4 and D5 suggest a combination of a feeder channel and a resin distribution network.

The subject-matter of claim 1 thus involves an inventive step.

## Reasons for the Decision

Main Request

1. Admissibility of Document D11

Document D11 was filed on 17 and 18 February 2009 by appellants I and II respectively, that is, at the same time as it was accepted by appellants I and II that it could not be established that document D10 was made available to the public before the priority date of the patent in suit. The document is a laid-open Japanese application and could thus be found in the course of a routine search. It appears that appellants II and III only considered it to be necessary to file the document when it became apparent that document D10 would not be considered to constitute prior art.

The board is thus of the opinion that document D11 was not filed as soon as possible.

Further, document D11 is not prima facie more relevant than the prior art which was cited within the opposition period.

Figure 5 of document D11 shows a core having a square cross-section and having transverse or circumferential channels in the plane of the cross-section intersecting with channels extending along the length of the core. The longitudinal channels are of two different depths, as mentioned at page 12, lines 16 and 17.

There is, however, no clear and unambiguous disclosure of the depth of the transverse grooves. It was suggested on behalf of appellants II and III that the section C-C is taken at the location of a circumferential groove and that the inner square shown in Figure 5b is a section indicating the depth of the circumferential grooves. However, in Figure 5b of document D11, there is no hatching to indicate that the inner square is a section. It is further not unambiguously disclosed that the section C-C is made at the location of a circumferential groove. The inner square may thus be a reinforcing element of the core, and there is no disclosure of the depth of the circumferential groove.

Further, there is no disclosure in document D11 of the relative width of the grooves. Whilst Figure 5a shows grooves of roughly the same width, the drawings can only be regarded as schematic and cannot be relied upon for measurement of relative dimensions. This is emphasised by the inconsistency between Figures 5a and 5b, Figure 5a showing two grooves on the upper and

lower surfaces of the core, whilst Figure 5b only shows a single groove on each surface.

There is thus no disclosure of the relative cross-sectional areas of the grooves and hence no disclosure in document D11 of a resin distribution network comprising a network of grooves formed in the surface of the core extending from a feeder channel, the grooves having a smaller cross-sectional area than the feeder channel.

Document D11 is accordingly not admitted into the procedure.

2. *Novelty*

2.1 Document D7

At column 10, lines 31 to 48, of document D7, it is disclosed that the cores shown in Figures 5 to 7 may be used in place of, or in addition to, the foamed cores 3,4,5 in the mould of Figure 1. The cores of Figures 5 and 6 possess a pattern of interconnecting channels 31,32 on each side of the core, connected by openings 33. In such an arrangement, the opening 6, in the form of a longitudinal groove in the core, is no longer present.

Whilst there is a disclosure to the effect that both types of core may be used together, this does not result in a "hybrid" core having features of each of the types of core.

There is thus no disclosure of a resin distribution network comprising a network of grooves formed in the surface of the core extending from a feeder channel, the grooves having a smaller cross-sectional area than the feeder channel.

2.2 The subject-matter of claim 1 is thus new.

3. *Inventive step*

3.1 Closest Prior Art

A structure using the core of Figures 5 and 6 of document D7 (with or without the additional presence of the cores shown in Figure 1) is regarded as constituting the closest prior art.

The subject-matter of claim 1 is distinguished from such a structure in that there is provided a feeder channel having a larger cross-sectional area than the channels 31,32.

3.2 Object of the Invention

The object of the invention considering document D7 as the closest prior art is thus considered as being to improve the supply of resin to the channels.

3.3 Solution

3.4 The person skilled in the art has at his disposal a number of alternatives to improve the supply of resin to the channels, for example providing a large number

of supply ducts or an external distribution channel such as that disclosed in document D5.

3.5 Document D3 discloses a moulding method in which a hole 26 is provided in a core in the region of the injection gate, so that resin flow can occur on both sides of the core. In addition, at least one longitudinal resin flow channel 17 is provided. It is disclosed at column 3, lines 13 to 15, and column 6, lines 10 to 12, that the flow channel may vary in cross-section along its length and that two or more channels of different sizes or varying cross-sections may be used. However, this disclosure does not suggest a network comprising a feeder channel from which a network of grooves extends, the grooves having a smaller cross-sectional area than the feeder channel.

Documents D4 and D5 also do not disclose or suggest the provision of a network of channels formed in the surface of the core. In the arrangement of document D4, resin is supplied through an inlet 15 and distribution is assisted by the presence of a helical spring 16. In the arrangement of document D5, resin is distributed by means of a system of conduits. Moreover, these documents do not disclose distribution networks formed in the surface of a core and covered by the fibre material.

The cited prior art, and in particular documents D3, D4 and D5, thus does not suggest the solution as defined in claim 1 to the problem set out in paragraph 3.2 above.

3.6 Alternative Approach

It was suggested on behalf of appellants I and II that document D2 could also be regarded as representing the closest prior art, referring in particular to Figure 5 and the passage at page 11, lines 9 to 29, of the description, which disclose the use of interconnecting channels ("galleries") at the surface of the core.

There is, however, no disclosure of the relative dimensions of the channels. The subject-matter of claim 1 is thus distinguished over the disclosure of document D2 in that there are provided grooves having a smaller cross-sectional area than the feeder channel.

3.7 As stated in the patent in suit at column 2, lines 30 to 34, the fact that the smaller grooves are filled with resin improves the delamination strength of the composite structure. The object of the invention considering document D2 as the closest prior art could thus be considered as being to achieve this advantage.

3.8 As discussed under point 3.5 above, the cited documents do not, however, suggest the provision of a network comprising a feeder channel from which a network of grooves extends, the grooves having a smaller cross-sectional area than the feeder channel.

3.9 The subject-matter of claim 1 thus involves an inventive step. Claims 2 to 11 relate to preferred aspects of the structure of claim 1 and similarly involve an inventive step.

## Order

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

The appeals are dismissed.

The Registrar: The Chairman:

D. Meyfarth W. Zellhuber