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Datasheet for the decision of 4 October 2022

Case Number: T 2866/18 - 3.2.03

Application Number: 06846060.9

Publication Number: 2097707

IPC: F28F9/04

Language of the proceedings: EN

Title of invention:
HEAT EXCHANGER DESIGN FOR IMPROVED PERFORMANCE AND MANUFACTURABILITY

Patent Proprietor:
Carrier Corporation

Opponent:
Mahle International GmbH

Headword:

Relevant legal provisions:
EPC Art. 100(b), 100(c), 54, 111
RPBA 2020 Art. 11, 13(2)
RPBA Art. 12(2), 12(4)

Keyword:

Grounds for opposition - insufficiency of disclosure (no) - extension of subject-matter (no)
Novelty - (yes) - prior disclosure - implicit features (no)
Amendment after summons - exceptional circumstances (no) - taken into account (no)
Appeal decision - remittal to the department of first instance (no)

Decisions cited:

J 0014/19, T 0184/17, T 0574/17, T 1179/17, T 1816/17, T 2360/17, T 1042/18, T 2161/18, T 2920/18, T 0151/19

Catchword:

Whether the documents which are taken as starting points for newly raised inventive step objections were previously used for objections regarding a lack of novelty has no bearing for determining whether these inventive step objections constitute an amendment to the opponent's appeal case under Article 13(2) RPBA 2020 (Reasons 4.7).

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Case Number: T 2866/18 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 4 October 2022

Appellant: (Patent Proprietor)	Carrier Corporation One Carrier Place Farmington, CT 06034-4015 (US)
Representative:	Dehns St. Bride's House 10 Salisbury Square London EC4Y 8JD (GB)
Appellant: (Opponent)	Mahle International GmbH Pragstr. 26-46 70376 Stuttgart (DE)
Representative:	Grauel, Andreas Grauel IP Patentanwaltskanzlei Wartbergstrasse 14 70191 Stuttgart (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 12 November 2018 concerning maintenance of the European Patent No. 2097707 in amended form.**

Composition of the Board:

Chairman	G. Patton
Members:	R. Baltanás y Jorge
	N. Obrovski

Summary of Facts and Submissions

I. European patent No. 2 097 707 B1 relates to a heat exchanger design for improved performance and manufacturability.

II. An opposition was filed against the patent, which was based on Articles 100(b) EPC, 100(c) EPC and 100(a) EPC in conjunction with Articles 54 EPC and 56 EPC.

III. The present appeal is against the interlocutory decision of the Opposition Division which found that the first auxiliary request filed in electronic form on 10 August 2018 fulfils the requirements of the EPC.

This decision was appealed both by the opponent and by the patent proprietor. Since both parties are therefore both appellant and respondent, they will be referred to herein as the opponent and patent proprietor respectively, for the sake of simplicity.

In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA 2020), the Board indicated its preliminary opinion of the case.

Oral proceedings were held on 4 October 2022.

IV. Requests

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

The patent proprietor requested that the decision under appeal be set aside and that the patent be maintained

as granted (main request) or, alternatively, that the patent be maintained according to one of auxiliary requests 1 to 3 as filed during the opposition proceedings with the submission dated 10 August 2018.

V. Claim 1 as granted, including the numbering of its features as adopted by the parties, reads as follows (the amendments objected to by the opponent are marked in bold):

M1.1 *A microchannel heat exchanger (24, 28) comprising:*

M1.2 *a pair of spaced manifold structures (30, 34)*

M1.3 ***each having a manifold wall (56),*** *and*

M1.4 *a plurality of heat transfer tubes (32, 132, 232, 332, 432, 60, 70, 80, 90) extending between said manifold structures in generally parallel relationship with each other and being in fluid communication with said manifold structures,*

M1.5 *each of said heat transfer tubes having a plurality of parallel channels (44, 46) spaced from each other,*

M1.6 *and said heat transfer tubes being inserted in openings (40, 54, 64) in said manifold structures,*

M1.7 *said heat transfer tubes being secured to said manifold structures by an initially fluent and then solidifying securing material (42, 52),*

M1.8 ***characterised in that said openings are formed in said manifold structures***

M1.9 ***by deforming the material of said manifold wall of said manifold structures outwardly away from an internal passage in said manifold structures***

M1.10 ***such that edges of said heat transfer tubes just slightly extend inwardly of said manifold wall***

M1.11 *and are positioned away from the edges of said openings*

M1.12 *to minimize the likelihood of said securing material at least partially blocking any of said plurality of channels.*

Dependent claims 2 to 8 concern preferred embodiments of the microchannel heat exchanger of claim 1. Claim 9 concerns a refrigerant system comprising the microchannel heat exchanger of any preceding claim.

VI. Originally filed claim 1 reads as follows (an analogous marking to that of granted claim 1 has been added by the Board):

M1.1' *A heat exchanger comprising:*

M1.2 *a pair of spaced manifold structures,*

M1.4 *and a plurality of heat transfer tubes extending between said manifold structures in generally parallel relationship with each other and being in fluid communication with said manifold structures,*

M1.5 *each of said heat transfer tubes having a plurality of parallel channels spaced from each other,*

M1.6 *and said heat transfer tubes being inserted in openings in said manifold structures,*

M1.7 *said heat transfer tubes being secured to said manifold structures by an initially fluent and then solidifying securing material,*

M1.13 *and there being modifications to at least one of said manifold structures and said heat transfer tubes*

M1.12 *to minimize the likelihood of said securing material at least partially blocking any of said plurality of channels.*

VII. The content of auxiliary requests 1 to 3 is not relevant to this decision.

VIII. State of the art

The following documents have been cited, both in the grounds of appeal and during the opposition proceedings, and are relevant to this decision:

D2: JP 2006 010271 A
D5: JP 2002 156196 A
D6: US 5,918,667 A
D10: WO 2005/003670 A1
D11: WO 2005/108899 A1
D13: EP 0 379 701 A1

IX. The opponent's arguments concerning the main request can be summarised as follows:

(a) Sufficiency of disclosure - Article 100(b) EPC

The patent does not provide a proper definition of the feature "microchannel heat exchanger" (M1.1), to the extent that the skilled person would not know when a channel corresponds to a "microchannel". The patent discloses that microchannels and minichannels exist (paragraphs [0003] and [0016]), thus acknowledging that they must be different. However, it does not provide

any guidance as to how to differentiate microchannels from standard channels or the cited minichannels. This is not a problem of a lack of clarity but rather of the delimitation of the scope of the claim.

Moreover, the combination of the features "[the] edges of said heat transfer tubes just slightly extend inwardly of said manifold wall" (M1.10) and "to minimise the likelihood of said securing material at least partially blocking any of said plurality of channels" (M1.12) is impossible for the skilled person to put into practice. The wording "just slightly" does not define the extension of the tubes beyond the manifold wall. This parameter is not defined in the patent specification either. However, the extension inwardly of the manifold wall is linked to a physical effect to be achieved, i.e. the minimisation of the likelihood of blocking. The wording "to minimise" implies that this likelihood must be zero, which is different from a mere reduction of the probability. In order to achieve the claimed minimisation, the tube has to extend far more than "just slightly" inwardly of the manifold wall. The patent does not explain how to make these two features compatible. Figure 4 and the corresponding paragraph [0017] do not provide any dimensions for putting the invention into practice, and do not actually disclose a minimisation as defined in feature M1.12. Finally, feature M1.12 will also depend on parameters belonging to the melting material, such as its viscosity, which are not disclosed in the patent specification.

(b) Extension of subject-matter - Article 100(c) EPC

Feature M1.3 ([a pair of spaced manifold structures] each having a manifold wall) is not originally

disclosed since Figure 2 does not concern a microchannel heat exchanger. Moreover, there is no original disclosure of a single manifold wall or a plurality of them in a manifold structure, and it is not clear whether the manifold wall is an internal or external wall.

The omission of a part of originally filed claim 4 ("*such that said heat transfer tubes do not extend inwardly of said manifold structures passing farther beyond a wall of said manifold structures*") resulted in an unallowable intermediate generalisation once features M1.8 and M1.9 had been added to claim 1. Furthermore, feature M1.10 (tubes extending just slightly inwardly of the manifold wall) is in contradiction with the omitted features of originally filed claim 4, such that the addition of feature M1.10 results in claiming the opposite of what was originally claimed.

The passage in lines 5 to 10 of originally filed page 3 cannot constitute a basis for the added features since it does not disclose an arrangement "**to minimise** the likelihood of said securing material at least partially blocking any of said plurality of channels" as in feature M1.12. The disclosure of an arrangement where channels "are unlikely to be blocked by brazing material" does not amount to the claimed minimisation. Thus, claim 1 gives rise to an unallowable intermediate generalisation even if this passage is taken into consideration.

The reasoning provided on page 6 of the decision under appeal with respect to a basis in the application as originally filed for claim 3 of the main request is not convincing.

(c) Novelty - Article 54(2) EPC

The subject-matter of claim 1 is not novel over either D10 or D11.

Feature M1.9 ([openings formed] by deforming the material of said manifold wall of said manifold structures outwardly away from an internal passage in said manifold structures) is a product-by-process feature. Figure 4 of the patent specification cannot be taken as the true representation of this feature since the dimensions and shape of the represented material framing the opening are not realistic. The true picture of an opening produced according to feature M1.9 corresponds rather to the representation in the figures of D10 or D11 (D10: see Figures 1, 7, 15 and 17; D11: see Figures 1, 2, 3 and 7). Both documents explicitly disclose that all protrusions and openings in the manifold wall (D10: 28; D11: 70) are formed at the same time by making the manifold wall "from an aluminium brazing sheet **by press work**" (D10: page 24, lines 5 to 8; D11: page 25, lines 3 to 7). Consequently, feature M1.9 is disclosed in D10 and D11.

(d) Admittance of inventive step objections and remittal request - Article 13(2) RPBA 2020 and Article 111 EPC

The Opposition Division did not discuss the inventive step of the main request. This justifies that the objections based on a combination of either D10 or D11 with any of D2, D5, D6 or D13 should be taken into consideration by the Board, even though they were raised for the first time in the oral proceedings before the Board. These documents were part of the

opposition proceedings and the objections were *prima facie* relevant, thus justifying their admittance. If they are not admitted, the case should be remitted to the Opposition Division.

The objective technical problem with regard to distinguishing feature M1.9 over D10 or D11 is how to form openings in order to ensure a stable connection without pressure loss. The claimed solution is known from D2 (Figure 3), D5 (Figure 6B), D6 (Figure 7, abstract, and page 6, line 39 and beyond) and D13, and therefore the claimed subject-matter is *prima facie* obvious to the skilled person.

X. The patent proprietor's arguments concerning the main request can be summarised as follows:

(a) Sufficiency of disclosure - Article 100(b) EPC

The concept of "microchannel heat exchanger" is well known to the skilled person and does not require an extensive definition in the patent specification.

Concerning the combination of features M1.10 (just slightly extending inwardly) and M1.12 (to minimise the likelihood of blocking), the patent illustrates an example for putting the invention into practice in the embodiment of Figure 4. The wording "to minimise" does not imply that the likelihood must be zero. This wording must be understood in the context of the other features. The discussion of the opponent focuses rather on clarity, which is not a ground for opposition, than on sufficiency of disclosure.

The other parameters which may have an effect on the minimisation of the channels' blocking likelihood -

such as the properties of the melting material - do not need to be defined when the invention is only about the shape of the tubes and manifold walls which allow this risk to be minimised.

(b) Extension of subject-matter - Article 100(c) EPC

Feature M1.3 ([a pair of spaced manifold structures] each having a manifold wall) finds a basis in the patent application as a whole since the manifolds disclosed therein always comprise a manifold wall, and Figure 2 illustrates a heat exchanger having two manifolds.

Feature M1.12 (to minimise the likelihood of blocking) was disclosed in originally filed claim 1 in combination with "*modifications to at least one of said manifold structures and said transfer tubes*". Lines 5 to 10 of originally filed page 3 disclose the modifications referred to in originally filed claim 1, corresponding to the features added to granted claim 1. Thus, the inclusion of these modifications in the claim has a basis in the originally filed application.

(c) Novelty - Article 54(2) EPC

Feature M1.9 ([openings formed] by deforming the material of said manifold wall of said manifold structures outwardly away from an internal passage in said manifold structures) is not disclosed in either D10 or D11. The figures of D10 and D11 do not disclose any material framing the corresponding openings (D10: 36; D11: 75), which should be present if the openings had been produced in the claimed way. The disclosure of "press work" in D10 and D11 encompasses the possibility that cutting could have been carried out as part of the

"press work" step. Furthermore, feature M1.9 defines a deformation "outwardly away from an internal passage", which is not clearly and unambiguously disclosed in D10 or D11.

(d) Admittance of inventive step objections and remittal request - Article 13(2) RPBA 2020 and Article 111 EPC

The late-filed objections should not be admitted into the proceedings since they represent a change to the appeal case at the last possible moment. The opponent had had a chance to react to the preliminary opinion of the Board and deliberately chose not to do so and to wait until the oral proceedings to present its objections. No exceptional circumstances can justify this. In particular, no exceptional circumstances can be seen in a case where a board is of a different opinion than the opposition division. Moreover, remittal should not be granted if the objections are not *prima facie* relevant.

Documents D2, D5 and D6 are not more relevant than D13. The problem addressed by the invention was how to provide an alternative construction for heat exchangers. The cited documents would not be consulted without hindsight by the skilled person trying to solve this problem since they do not deal with microchannel heat exchangers, in contrast to D10 and D11.

Finally, the fact that the patent proprietor discussed a hypothetical combination with D13 in its appeal submissions does not mean that this was part of the opponent's case. The opponent did not raise any corresponding objection until the oral proceedings.

Reasons for the Decision

1. Main request (patent as granted) - Article 100(b) EPC

1.1 Feature "microchannels" (M1.1)

The Board agrees with the patent proprietor in that the term "microchannel heat exchangers" is common in this particular technical field when referring to a specific kind of heat exchanger comprising a plurality of parallel channels longitudinally arranged within every heat transfer tube communicating with two manifolds. The reference to "minichannels" in the patent specification cannot cast any doubt on the meaning of the feature "microchannels" to the extent of preventing the skilled person from being able to reproduce the invention. The skilled reader understands that both terms are used interchangeably (see paragraph [0003], last sentence) when referring to this specific kind of heat exchanger.

Therefore, the skilled person can implement this feature in the light of their common general knowledge.

1.2 Combination of features M1.10 ("just slightly") and M1.12 ("to minimise the likelihood")

The Board does not agree with the interpretation of the feature "**to minimise** the likelihood of said securing material at least partially blocking any of said plurality of channels" (M1.12) proposed by the opponent. The term "to minimise" cannot be understood as ensuring an absolute minimum, neither according to the literal meaning of the term nor when this is

interpreted in the context of the patent. The skilled person would interpret "to minimise" in feature M1.12 as reducing the likelihood of blocking the channels. This implies, in the context of features M1.10 and M1.12, that a compromise must be reached between feature M1.10 (i.e. arranging the edge of the tubes as close as possible to the manifold wall) and feature M1.12 (i.e. the minimisation of the likelihood of the channels getting blocked by the securing material), something which requires that the edge of the tubes is arranged at some distance from the manifold wall.

The wording "just slightly" does not specify how far the tube extends inwardly of the manifold wall, but this does not prevent the skilled person from putting the invention into practice, since they would know how to reach the above-mentioned compromise by simple trial and error. In particular, Figure 4 and the description (see paragraph [0017]) disclose an example which would assist the skilled person in this respect.

Concerning the properties of the melting material and other undefined parameters of the brazing process, the skilled person would know how to adapt the invention to different materials and conditions in order to reach the compromise defined in claim 1. All these parameters are conventional in the field of brazing, and the skilled person is used to adapting their way of working depending on the parameters involved.

1.3 In view of the above, the ground for opposition based on Article 100(b) EPC does not prejudice the maintenance of the patent in accordance with the main request.

2. Main request (patent as granted) - Article 100(c) EPC

2.1 Feature M1.3 ("[a pair of spaced manifold structures] each having a manifold wall")

The opponent did not bring forward any new arguments concerning feature M1.3 during the oral proceedings, and declared that it maintained its position as submitted in written form.

In view of this, the Board remains of the opinion advanced with its preliminary position on the case, namely that the feature is disclosed in the originally filed application for the following reasons:

Originally filed Figure 2 concerns a heat exchanger of the prior art related to the invention (see page 2, lines 1 to 4), presenting the problem of blocked microchannels (see Figures 3A and 3B, and also page 6, lines 1 to 3 and 9 to 12). The originally filed application discloses immediately afterwards the solution for such a problem in the kind of heat exchangers disclosed in Figure 2 (see page 6, lines 29 to 31).

Since the heat exchanger of Figure 2 concerns a microchannel heat exchanger comprising two manifold structures 30, 34, each disclosing a manifold wall (see page 6, lines 4 and 5), and since the disclosed solution for the problem in such a heat exchanger comprises providing the claimed openings in a wall 56 of the given manifold structures (see page 2, line 4 to 8, and page 6, lines 29 to 31), it can be concluded that feature M1.3 has a basis in the originally filed application.

2.2 Features M1.8 (openings in manifold structures), M1.9 (deforming the material outwardly away) and M1.10 (edges of the tubes extend just slightly inwardly)

The arguments of the opponent against the use of lines 5 to 10 of originally filed page 3 as a basis for the combination of feature M1.10 with features M1.8 and M1.9 in claim 1 of the granted patent are not persuasive.

Originally filed claim 1 comprises feature M1.13 (there being **modifications** to at least one of said manifold structures and said heat transfer tubes), which is immediately followed by feature M1.12 (**to minimise** the likelihood of blocking). Both features have to be considered in combination given the causal relationship thereby defined. Thus, the reader knows that the minimisation of the likelihood of blocking results from modifications to the manifold structures and heat transfer tubes.

When reading the first section of the "Summary of the invention", the reader further learns that, according to the invention, modifications to the manifold structures (page 3, lines 5 to 6) and the heat transfer tubes (page 3, lines 6 to 8) can be provided "***such that*** *channels in the heat transfer tubes are* ***unlikely to be blocked*** *by brazing material during the brazing process*". Given the intended interpretation of the feature "to minimise the likelihood" (see section 1.2 above), the reader will understand that the arrangement disclosed at the beginning of the "Summary of the invention" is intended to minimise the likelihood of blocking, even if it is worded differently from feature M1.12. The reader will also understand that the modifications to the manifold and heat transfer tubes

disclosed in this section of the "Summary of the invention" correspond to the "modifications" of feature M1.13 which are necessary to minimise the likelihood of blocking according to originally filed claim 1.

Consequently, lines 5 to 10 of originally filed page 3 relate to an embodiment concerning the minimisation of the likelihood of blocking and can form the basis of amendments to claim 1 which are linked to this effect (defined in feature M1.12).

Thus, the content of originally filed claim 4 is not relevant to the discussion on added subject-matter.

2.3 The opponent alleges that the arguments given on page 6 of the decision under appeal concerning the basis in the application as originally filed for dependent claim 3 of the main request are not persuasive. It does not, however, provide any arguments as to why this is the case. In the absence of any substantiated reasons for requesting the reversal of the decision under appeal in this regard, the Board has decided not to take this allegation into account (Article 12(2) and (4) RPBA 2007).

2.4 In view of the above, the ground for opposition based on Article 100(c) EPC does not prejudice the maintenance of the patent in accordance with the main request.

3. Main request (patent as granted) - Article 54 EPC

The subject-matter of claim 1 differs from each of D10 and D11 in feature M1.9 ([openings formed] by deforming the material of said manifold wall of said manifold

structures outwardly away from an internal passage in said manifold structures).

The opponent is right in that feature M1.9 is a "product by process" feature. Thus, in order to ascertain a difference over other products produced in a different way, a distinguishing feature must be present in the claimed product that is brought about by the production method used.

The opponent is also right in that Figure 4 of the patent specification cannot be taken as a reference as to what the resulting product should look like. The dimensions of the portions of material framing the openings in Figure 4 are approximately as long as the diameter of the opening, which does not seem compatible with a punching step. Furthermore, neither the coincident length of the framing material above and below each heat transfer tube (32, 132) nor the shape of the edges thereof fit with the lack of uniformity a punching step should entail when the manifold wall is traversed by a punch.

However, this does not mean that feature M1.9 does not imply a limitation. The formation of openings by deforming the material of the manifold wall outwardly away from the internal passage necessarily entails the presence of some of the material of the manifold wall framing the opening at the exterior side of the manifold.

Contrary to the opinion of the opponent, the figures of D10 and D11 do not disclose any material framing the openings of the manifold (D10: slits 36; D11: slits 75). Figures 1, 2, 3 and 7 of D11, where slits (75) are shown, do not clearly and unambiguously disclose such a

feature. In Figure 3 of D11 it can be observed that the slits (75) are provided on an upper portion of the manifold wall formed between the grooves (74), but no framing of the openings (75) by the allegedly deformed material can be seen. It should be noted that the deformed material defined in feature M1.9 is the one resulting **from the formation of the openings** (feature M1.8), and not the one resulting from any other deformation (e.g. for forming the grooves 74 and the raised spaces between them in D11). The same applies to Figures 1, 7, 15 and 17 of D10, which correspond to the cited figures of D11 as far as the slits (36) and the grooves (35) of D10 are concerned (D11 uses different reference numerals).

Even though the descriptions of D10 and D11 disclose that all protrusions and openings in the manifold wall (D10: 28; D11: 70) are formed at the same time by making the manifold wall "*from an aluminium brazing sheet* ***by press work***" (D10: page 24, lines 5 to 8; D11: page 25, lines 3 to 7) (emphasis added), they do not disclose in a clear and unambiguous manner that the openings are formed by deforming the material of said manifold wall **outwardly away** from an internal passage in the manifold structures. Thus, even assuming that "press work" excludes a cutting tool at the pressing device which could produce the openings, nothing in D10 or D11 hints at the presence of a punch which deforms the material of the manifold wall **in the claimed direction**.

In view of the above, the subject-matter of claim 1 is novel over both D10 and D11 (Article 54(2) EPC).

4. Main request (patent as granted) - admittance of inventive step objections - Article 13(2) RPBA 2020

4.1 In its Notice of Opposition, the opponent raised lack of novelty objections against claim 1 of the main request on the basis of documents D10 to D13. The opponent also raised an inventive step objection against claim 1 starting from document D13, in case the Opposition Division were to consider the subject-matter of claim 1 novel.

4.2 In the decision under appeal, the Opposition Division considered claim 1 of the main request to lack novelty over documents D10 and D11. The patent proprietor contested this finding in its statement of grounds of appeal. In its reply thereto, the opponent did not raise any inventive step objections against the main request. Instead, the opponent simply announced that it would comment on inventive step during the oral proceedings before the Board if the Board did not accept its view on novelty regarding claim 1.

4.3 In its communication under Article 15(1) RPBA 2020, the Board gave its reasoned preliminary opinion that, contrary to what had been held by the Opposition Division, the subject-matter of claim 1 was novel over documents D10 and D11 (section 9.3.4). The Board further noted the absence of any objections by the opponent as regards inventive step (section 9.4).

4.4 In the oral proceedings before the Board, the Board confirmed its preliminary opinion and concluded that the subject-matter of claim 1 was novel over documents D10 and D11. Subsequently, for the first time in the proceedings before the departments of both instances, the opponent raised inventive step objections starting

from either document D10 or D11 in combination with any of documents D2, D5, D6 or D13.

4.5 Under Article 13(2) RPBA 2020, any amendment to a party's appeal case made after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

4.6 As the opponent's inventive step objections were not contained in its reply to the patent proprietor's statement of grounds of appeal, raising them for the first time at the oral proceedings before the Board constitutes an amendment to the opponent's appeal case under Article 13(2) RPBA 2020 (see J 14/19, Reasons 1.4-1.8), the admittance of which is subject to the Board's discretion. Whether or not these objections stay within the same overall "factual and legal framework" is not decisive for the purpose of determining what constitutes an amendment of the appeal case under the RPBA 2020 (T 2360/17, Reasons 2.4, last paragraph). It may, however, play a role in the Board's exercise of discretion under Article 13(2) RPBA 2020 (see T 574/17, Reasons 2.3.1 and T 2920/18, Reasons 3.13).

4.7 The question of whether there has been an amendment to a party's appeal case under the RPBA 2020 has to be distinguished from the question of whether a fresh ground of opposition has been raised. Whether the documents taken as starting points for new inventive step objections were previously used for objections regarding a lack of novelty has no bearing for determining whether these inventive step objections constitute an amendment to the opponent's appeal case

under Article 13(2) RPBA 2020 (see T 1042/18, Reasons 4.3-4.12; see also T 1179/17, Reasons 4.6.2; T 1816/17, Reasons 12; T 2161/18, Reasons 5.4; and T 151/19, Reasons 3.7.5). Having said that, the Board notes that combining D10 or D11 with new documents such as D2, D5, D6 or D13 also goes beyond the "factual and evidentiary framework" of the previous novelty objections within the meaning of T 184/17, Reasons 4.8.

4.8 The opponent put forward that its inventive step objections as raised in the oral proceedings before the Board were *prima facie* relevant. Other than that, no reasoning justifying exceptional circumstances under Article 13(2) RPBA 2020 was provided.

4.9 Although it is not a necessary precondition for a Board to assess the *prima facie* relevance of an objection in order to come to the conclusion that there are no exceptional circumstances under Article 13(2) RPBA 2020, the Board considered it appropriate in the present case to conduct such a *prima facie* assessment (see T 574/17, Reasons 2.3.3). It is noted that, in view of the Opposition Division's finding of a lack of novelty of the subject-matter of the main request, inventive step was not assessed in the opposition proceedings.

4.10 Prima facie relevance of the inventive step objections

4.10.1 The heat exchangers of D10 and D11

Both D10 and D11 concern microchannel heat exchangers comprising heat transfer tubes (D10: 4; D11: 12) having a plurality of refrigerant channels (D10: 4a; D11: 12a) extending longitudinally of the tube and arranged in parallel (D10: see Figure 3; D11: see Figure 9). Thus,

when considering combining D10 or D11 with any prior-art document, it must be assessed whether or not the skilled person would regard such a combination as being compatible with the heat transfer tubes of these documents.

4.10.2 Objective technical problem starting from D10 or D11

The patent proprietor proposes as an objective technical problem "how to provide an alternative construction for heat exchangers".

The opponent argues that the objective technical problem is "how to carry out openings in order to ensure a stable connection without pressure loss".

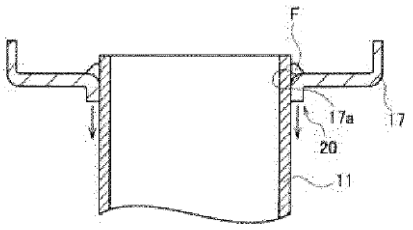
The technical effect of the distinguishing feature M1.9 ([openings formed] by deforming the material of said manifold wall of said manifold structures outwardly away from an internal passage in said manifold structures) is that some of the material of the manifold wall will frame the openings at the external side of the manifold.

The Board sides with the opponent in that, in view of the technical effect, the objective technical problem can be defined as how to carry out openings in the manifold wall in order to provide a stable connection (because of the framing material around the opening). However, the aspect relating to a reduced pressure loss cannot form part of the problem, since feature M1.9 does not *per se* define any limitation that would relate to this effect.

4.10.3 Combination of D10 or D11 with D2

The opponent refers to Figure 3 of D2 in support of its arguments.

However, this figure (reproduced below) does not disclose in a clear and unambiguous manner that the opening is **formed by deforming the material** of the manifold wall since the portions of material framing the opening are very small with respect to the diameter of the opening. Consequently, the opening of Figure 3 appears to have been produced by means other than deformation, such that the edge of an already existing opening is later deformed in a further step.



As D2 does not disclose feature M1.9 at first sight, the objection based on a combination with this document is not *prima facie* relevant.

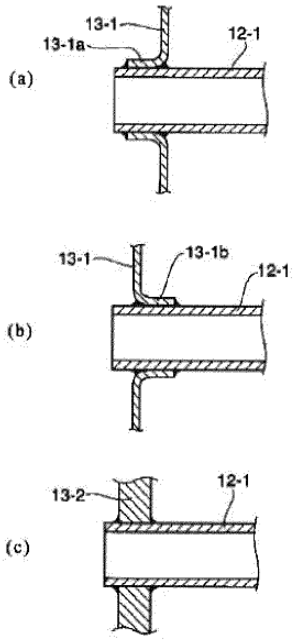
4.10.4 Combination of D10 or D11 with D5

The opponent argues that Figure 6(b) of D5 discloses the distinguishing feature.

However, Figure 6(b) is just one out of three embodiments disclosed in Figure 6 (reproduced below), all of which form part of the prior art discussed in D5 (see paragraph [0004] of the translation which was included in D5). Figure 6(a) discloses an embodiment where the manifold wall is deformed inwardly towards

the internal passage of the manifold. Figure 6(c) discloses an embodiment where no deformation of the manifold wall is carried out. All three embodiments are presented as alternatives, and there is no pointer to suggest to the skilled person that the embodiment of Figure 6(b) is particularly advantageous (or that it could address the technical problem at issue).

【図6】

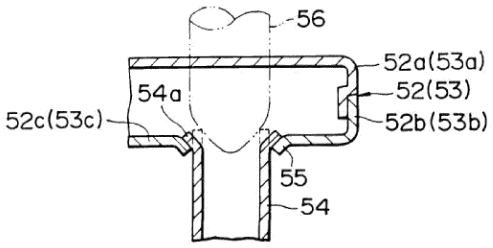


In the absence of such a pointer, nothing can *prima facie* be identified that would motivate the skilled person to consult D5 and to adopt a particular solution of the prior art discussed in this document in order to combine it with D10 or D11. Thus, the objection is not *prima facie* relevant.

4.10.5 Combination of D10 or D11 with D6

The opponent argues that Figure 7 of D6 (reproduced below) discloses the distinguishing feature M1.9.

Figure 7 of D6 discloses a tapered portion of an opening (55; see column 6, lines 17 to 19). As in the case of D2 (see section 4.10.3 above), the relative dimensions of the material framing the opening and the diameter of the opening itself hint at an opening which is not produced by deformation of the manifold wall, contrary to feature M1.9.



Moreover, the use of a jig (56) to deform the heat transfer tube (54) is incompatible with the microchannel construction of the heat transfer tubes of D10 (4) and D11 (12) since the work of the jig would collapse the end portions of the walls (D10: 4a; D11: 12a) defining the microchannels.

Consequently, combining either of D10 or D11 with D6 is not *prima facie* relevant.

4.10.6 Combination of D10 or D11 with D13

Document D13 discloses that the material of the manifold wall could frame its openings inwardly (Figures 1 and 4), outwardly (Figures 11 to 16) or that no framing material at all could be present around the openings (Figures 5, 6, 7, 17 and 18). No particular advantage of the embodiments of Figures 11 to 16 with regard to the posed technical problem is disclosed in D13 at first sight. Thus, the same logic as in section 4.10.4 applies here.

Furthermore, the system of D13 is based on flat tubes (2) having circular portions (2*) at their ends for connection with the manifold. The presence of parallel channels as in D10 (4a) and D11 (12a) is incompatible with this construction, since the exit of a large part of the lateral channels would be blocked due to the smaller diameter of the circular portion (2*) with respect to the total width of the flat tube (2) (see top view of Figures 2 and 3 as well as Figure 16 with regard to the side views of Figures 1 and 15).

In view of the above, the objection is not *prima facie* relevant.

4.11 As a result of the above, the aforementioned inventive step objections are not admitted into the proceedings pursuant to Article 13(2) RPBA 2020.

5. Main request - remittal request - Article 111 EPC

5.1 The opponent requested remittal of the case to the Opposition Division in case its inventive step objections were not admitted into the appeal proceedings under Article 13(2) RPBA 2020.

5.2 It would be contradictory to first not admit objections into the appeal proceedings only to then remit the case to the Opposition Division to allow a discussion of the very same objections in the opposition proceedings. The Opposition Division's second decision would then likely be based, within the meaning of Article 12(2) RPBA 2020, on these objections and the Board would then have to deal with them in substance in a second appeal, even though it did not admit them into the proceedings in the first appeal. Hence, not admitting certain objections into the appeal proceedings clearly does not

constitute a special reason under Article 11 RPBA 2020 for remitting the case to the Opposition Division. The opponent's request to that effect is thus rejected in accordance with Article 111(1) EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is maintained as granted.

The Registrar: The Chairman:

C. Spira G. Patton

Decision electronically authenticated