Datasheet for the decision of 8 October 2019

Case Number: T 1362/15 - 3.2.06
Application Number: 05773234.9
Publication Number: 1787017
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Language of the proceedings: EN

Title of invention:
CATALYTIC CONVERTER AND ASSOCIATED METHOD OF ASSEMBLY

Patent Proprietor:
Faurecia Emissions Control Technologies, USA, LLC

Opponent:
Tenneco GmbH

Headword:

Relevant legal provisions:
EPC Art. 56, 123(2), 112(1)(a)
35 U.S.C 112
Keyword:
Inventive step - main request (no) - auxiliary request 1 (no)
Referral to the Enlarged Board of Appeal - admissibility (no)
Amendments - extension beyond the content of the application as filed - auxiliary requests 2 to 4 (no)

Decisions cited:
T 2619/11, T 1414/11, G 0002/98, G 0002/10, G 0003/98, G 0002/99, T 1629/15

Catchword:
See points 3.1 to 3.7.3 of the Reasons
Case Number: T 1362/15 - 3.2.06

DECISION
of Technical Board of Appeal 3.2.06
of 8 October 2019

Appellant: Faurecia Emissions Control Technologies, USA, LLC
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Decision under appeal: Interlocutory decision of the Opposition Division of the European Patent Office posted on

Composition of the Board:
Chairman: M. Harrison
Members: P. Cipriano
E. Kossonakou
Summary of Facts and Submissions

I. An appeal was filed by the appellant (proprietor) against the interlocutory decision of the opposition division in which it found that European patent No. 1 787 017 in an amended form met the requirements of the EPC.

II. The appellant requested with its grounds of appeal that the interlocutory decision be set aside and the opposition be rejected. As an auxiliary measure it further requested that the patent be maintained on the basis of auxiliary requests 1 to 5, whereby auxiliary request 5 corresponded to the claims found allowable in the contested decision.

III. The respondent (opponent) requested that the appeal be dismissed.

IV. The following documents are relevant to the present decision:
E2 DE 36 26 728 A1
E4 US 5 119 551 A

V. The Board issued a summons to oral proceedings including a communication containing its provisional opinion, in which it indicated inter alia that the subject-matter of claim 10 of the main request and of auxiliary request 1 did not seem to involve an inventive step at least when starting from E2 in combination with common general knowledge. Regarding claim 10 of auxiliary requests 2 to 4, it further stated that the dependency of the original claims did not seem to provide a basis for a claim combining granted claim 11 with the features of granted dependent claims 12, 14 and 15.
VI. With letter dated 24 September 2019, the appellant requested the referral of a question to the Enlarged Board of Appeal.

VII. Oral proceedings were held before the Board on 8 October 2019, during which the appellant submitted a set of two questions for the requested referral, which replaced the previous question.

The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (main request) or in accordance with one of the claim requests submitted with the grounds of appeal as auxiliary requests 1 to 5, whereby auxiliary request 5 corresponded to the claims found allowable in the contested decision.

The appellant further requested the referral of a set of two questions to the Enlarged Board of Appeal as submitted during the oral proceedings before the Board.

The respondent requested that the appeal be dismissed.

VIII. Claim 10 of the main request reads as follows:
"A catalytic converter (10) comprising an outer tube (24) formed without any weld and comprising a tubular first side portion (22), a tubular second side portion (28), and a tubular intermediate portion (32) positioned between the first and second side portions (22, 28), each of the first and second side portions (22, 28) having a diameter smaller than a diameter of the intermediate portion (132), the outer tube (24) having a longitudinal axis,
a first catalyzed substrate (14) and a second catalyzed substrate (16), the first catalyzed substrate (14) being secured in the first side portion (22), the second catalyzed substrate (16) being secured in the second side portion (28), and

a tubular heat shield (18) positioned in the intermediate portion (32) around the longitudinal axis to inhibit transfer of heat from exhaust gas present in the intermediate portion (32) to the intermediate portion (32)."

Claim 10 of auxiliary request 1 differs from claim 10 of the main request in that it further defines that "the heat shield (18) comprises an inner tube (40) positioned in the intermediate portion (32), wherein the inner tube (40) comprises a main body (144) and opposite first and second end portions (48) extending inwardly from the main body (144)."

Claim 10 of auxiliary request 2 differs from claim 10 of auxiliary request 1 in that it further defines "an oxygen sensor (20) secured to the intermediate portion (32)".

Claim 10 of auxiliary request 3 differs from claim 10 of auxiliary request 2 in that it further defines that "the first end portion (148a) engages the first side portion (22) to establish a mechanical lock therebetween, and the second end portion (148b) engages the second side portion (28) to establish a mechanical lock therebetween."

Claim 10 of auxiliary request 4 differs from claim 10 of auxiliary request 3 in that it further defines
"wherein the heat shield (18) comprises a tubular insulation layer (42) positioned between the inner tube (40) and the intermediate portion (32)."

The questions which the appellant requested be referred to the Enlarged Board of Appeal read:
"1) Does it comply with Art. 123(2) EPC if the features of a plurality of dependent claims are incorporated into an independent claim in a situation in which the application as originally filed includes a claims set with a “U.S. style” dependency (with the relevant dependent claims referring back to the independent claim separately), and includes an embodiment in which the features of the independent claim and the dependent claims are shown in combination?

2) If the answer to question 1) is “yes”, may the fact that the embodiment possibly shows additional features, result in a violation of Art. 123(2) because of an intermediate generalization despite the fact that the features added to the independent claim are disclosed separately in the U.S. style claims set?"

IX. The arguments of the appellant may be summarised as follows:

Main request - Article 56 EPC

The subject-matter of claim 10 involved an inventive step.

E2 did not unambiguously disclose that a seamless tube was used for the housing. It was likely that the housing was formed from two shells and that the only possible method of joining the two shells was welding. The other alternative methods such as extrusion,
gluing, crimping or tying did not make technical sense, since they would not be able to withstand high temperatures and/or provide gas tightness.

Further, E2 did not disclose a heat shield. There was no indication that the support ring 10 of E2 had any of the properties required to inhibit heat transfer from the inside space of the intermediate portion to the wall of the intermediate portion. In E2 it was the continuous support mat 2 extending from substrate 3 to substrate 3' that performed the function of shielding from heat.

E2 disclosed that the ring 10 could be made of steel, a material with a notoriously high thermal conductivity that had no heat shielding properties. The same applied to the possible use of ceramics disclosed in the same context, which also did not necessarily have a low thermal conductivity.

E2 also had an embodiment where a metal foil 13'' was used instead of a support ring. Since the effect of the support ring 10 could be achieved with a thin metal foil, it was obvious that the support ring 10 did not have heat shielding properties. The ring in E2 was not specifically set up to inhibit the transfer of heat, so it could not be considered a heat shield.

An outer tube formed without any weld was necessarily seamless and provided a continuous tubular (i.e. circular) inner surface which centered the heat shield perfectly.

There was no objective motivation for the person skilled in the art to re-design the catalytic converter of E2 in a manner to arrive at the subject-matter of
claim 10. If a continuous central cylindrical housing portion were to be used then the end side portions would have to be formed separately, since they were conical.

Although no evidence was filed on this, at the priority date of the patent no other method was known to the skilled person in this specific technical field besides welding. Further, many techniques, such as tying, did not allow for a reduction of the diameter of the side portions.

Auxiliary request 1 - Article 56 EPC

E2 did not disclose the added features, because the support ring 10 ("Stützring") was not a heat shield.

Request for referral of two questions to the Enlarged Board of Appeal

The questions concerned a point of law of fundamental importance. U.S. Patent law limited the possibilities of drafting dependent claims, and the use of multiple dependencies in the U.S. implied high costs.

In cases such as the present one, where the amended claim was a combination of features from originally filed dependent claims that did not respect the original dependency, the existence of an embodiment in the disclosure containing all the combined features (albeit with even more features) should be enough to fulfill the requirement of Article 123(2) EPC. An answer from the Enlarged Board was thus required to come to a decision in the present case.
T 2619/11 and T 1414/11 came to contradicting conclusions on this matter such that there was no uniform application of the law at the present time.

**Auxiliary requests 2 to 4 - Article 123(2) EPC**

Claim 10 of auxiliary requests 2 to 4 fulfilled the requirement of Article 123(2) EPC.

Although no combination of dependent claims provided the combination of features of claim 10 of any of auxiliary requests 2 to 4, the embodiment of Figures 5 to 7 comprised all the features of claim 10 of auxiliary requests 2 to 4 and thus provided a basis for the respective combination of features.

The claimed oxygen sensor was not defined in further detail in this embodiment because it was not relevant for the invention.

**X.** The arguments of the respondent may be summarised as follows:

**Main request - Article 56 EPC**

The subject-matter of claim 10 did not involve an inventive step.

Due to its shape and material, the support ring 10 in E2 was also a heat shield. The patent did not disclose any further specific property for the heat shield that the support ring 10 of E2 did not have.

E2 disclosed a cylindrical, thus necessarily with a circular cross-section, outer tube being formed without any weld.
There was no technical effect provided by the differing feature. The objective problem was only to provide an alternative method of creating the tube.

The skilled person knew non-welding techniques for forming a tube from general mechanical principles and that these could be applied in this technical field. To form a tube without welds was thus one of the obvious possibilities known to the skilled person.

**Auxiliary request 1 - Article 56 EPC**

E2 also disclosed the added feature such that the problem/solution approach starting from E2 did not change with regard to the main request.

**Referral of two questions to the Enlarged Board of Appeal**

U.S. patent law did not limit the possibilities of combining subject-matter of claims. Multiple dependencies were also possible. This was not a point of law, rather simply a question of cost due to the number of claims that needed to be drafted.

The criteria to assess extension of subject-matter at the EPO were defined in the decision of the Enlarged Board of Appeal G2/10 and were suitable to be applied in the present case.

**Auxiliary requests 2 to 4 - Article 123(2) EPC**

Claim 10 of auxiliary requests 2 to 4 contravened Article 123(2) EPC.
The embodiment of Figures 5-7 disclosed an oxygen sensor with more features than the one defined in the claim, e.g. the position of the oxygen sensor in the drawings was more specifically defined than simply being secured to the intermediate portion. No part of the whole disclosure led the skilled person to consider any part of the oxygen sensor or its mounting as something which could be omitted.

**Reasons for the Decision**

1. **Main request - Article 56 EPC**

1.1 The appellant argued that the starting point E2 did not disclose the following feature of claim 10:

- a tubular heat shield (18) positioned in the intermediate portion (32) around the longitudinal axis to inhibit transfer of heat from exhaust gas present in the intermediate portion (32) to the intermediate portion (32).

1.1.1 E2, Figure 1 and column 4, lines 18 to 21, discloses a tubular shaped support ring ("Stützring 10") positioned between the ceramic bodies 3 and 3' around the longitudinal axis as defined in claim 10. This ring is made of metal or ceramics, as disclosed in column 3, lines 19 to 23.

1.1.2 The appellant argued that there was no indication that the support ring 10 of E2 had any of the properties required for this purpose. However, the patent also does not disclose any particular physical feature of this heat shield consisting of an inner tube 40 (such
as a specific material or thermal conductivity) that could lead the skilled person to establish a difference between the inner tube 40 of the patent and the support ring 10 of E2. In the absence of any discernible difference, the support ring 10 in E2 thus corresponds to an inner tube 40 and is therefore also a heat shield, since it poses a further barrier against contact with the hot exhaust gas, which inhibits, at least to some extent, heat transfer from the inside space of the intermediate portion to the wall of the intermediate portion.

1.1.3 The appellant's argument that the support ring 10 in E2 could be made of steel or ceramics and that the thermal conductivity of these materials was either notoriously high or not disclosed, does not alter the Board's conclusion. As already stated above, whilst it is true that E2 does not disclose the thermal conductivity of the steel and ceramic materials used in the support ring, neither does the patent, let alone the claim, specify any material or material property necessary for the tube 40 to qualify as a heat shield.

1.1.4 The appellant argued further that the heat shielding function in E2 was carried out by the mat 2 and not by the ring 10. The embodiment of Figure 1 in E2 comprises a mat 2 and a ring 10 in the same fashion as paragraph [0013] and Figure 1 of the patent together disclose that the heat shield 18 comprises an inner tube 40 and, optionally, an additional insulation layer 12. Both arrangements are analogous. If the inner tube 40 in this embodiment of the patent is considered a heat shield according to the invention, there is no reason to assume differently for the ring 10 in E2, since no structural differences have been defined.
1.1.5 As the appellant also argued, E2 comprised embodiments with a thin foil replacing the support ring 10, and in these embodiments only the mat 2 provided a heat shielding function. However, the heat shielding function of the mat 2 and of the support ring 10 in E2 are not mutually exclusive and the support ring 10 provides an additional heat shield in the same way that the heat shield 18 of the patent disclosed in paragraph [0013] may comprise an optional insulation layer 42 in addition to tube 40.

1.1.6 Thus, the support ring 10 in E2 corresponds to the tubular heat shield as defined in claim 1.

1.2 It is undisputed between the parties that the feature - outer tube (24) formed without any weld

was not unambiguously disclosed in E2 and that all the remaining features of claim 10 were disclosed in E2. The Board also sees no reason to find otherwise, in particular since although no weld is shown or described, this does not mean that no weld is present.

1.3 The appellant argued that an outer tube formed without any weld was necessarily seamless, and thus resulted in a single piece which then provided a continuous circular inner surface that centered the heat shield perfectly. The Board however does not find this argument correct. Other manufacturing techniques which do not resort to welding, such as tying, crimping or gluing, do not result in a seamless continuous circular inner surface made of a single piece, yet still fall within the claim as the claim only excludes welded tubes and a tubular shape does not necessarily need to have a circular cross-section (see e.g. E4, Figure 4
and column 1, lines 29-55, disclosing a tube with an oval cross-section). The Board can see no technical effect provided by excluding welding from the possible tube manufacturing methods.

The objective technical problem to be solved when starting from E2 as the closest prior art can thus be formulated as being to provide an alternative joining technique for the formation of the outer tube.

1.4 E2 does not disclose any specific information regarding the formation of the metal tube. However, the Board finds that many suitable techniques for forming a tube from a single piece or from two shells, besides welding, are well known in general mechanics to the skilled person, such as extrusion, gluing, crimping or tying. The skilled person would, when looking for an alternative technique, simply select another suitable one from their knowledge of known possibilities, such as tying the two shells together e.g. by circular metal clamps. They would thus arrive at the subject-matter of claim 10 in an obvious manner.

1.4.1 The appellant argued that at the priority date of the patent no other method was known to the skilled person in this specific technical field besides welding, such that the skilled person would not look for any other solution. The Board however does not accept this. There is no feature, implicit or explicit, in the claim that would limit the tube formation technique to any specific method from the joining techniques known to the skilled person well before the priority date from general mechanical production techniques. For example, there is no technical limitation in the claim that would make it unsuitable for the skilled person to tie two shells together and apply a sealant between them.
The appellant's argument that such methods would not withstand high temperatures and seal properly, does not persuade the Board. In the absence of any evidence to support the appellant's argument, the Board finds that the formation and joining techniques known to the skilled person allow for shells to be made, tied and sealed with enough precision and such that they can withstand the temperatures in catalytic converters.

1.4.2 The argument that the skilled person would not arrive at a seamless continuous central cylindrical housing portion when starting from the housing shape of E2, since the conical end side portions would then have to be formed separately, is not found convincing by the Board. As discussed above, the wording of claim 1 simply excludes welding but does not define a seamless housing, i.e. other joining techniques besides extrusion for joining two shells are possible, even those with seams. The longitudinal section in Figure 1 of E2 does not show any discontinuity, but the skilled person knows that the discontinuity may lie in another plane and would recognize in an obvious manner that the shape of the tube in E2 would be obtainable even if it were formed, for example, by tying two separate shells together.

1.4.3 The appellant further argued that many techniques, such as tying, did not allow for a reduction of the diameter of the side portions. However, apparatus claim 10 does not define the specific sequence or the method used to create this reduced diameter. Thus, when tying the two shells, each portion of the shell may possibly already be preformed to the various specific diameters. Thus, the appellant's argument does not alter the Board's conclusion.
1.5 For the above reasons, the subject-matter of claim 10 of the main request is obvious to a skilled person when starting from E2 and given the technical problem to be solved, simply when considering the common knowledge of the skilled person. The subject-matter of claim 1 therefore does not involve an inventive step (Article 56 EPC). The main request is thus not allowable.

2. Auxiliary request 1 - Article 56 EPC

2.1 Claim 10 of auxiliary request 1 differs from claim 10 of the main request in that it further defines that

- the heat shield (18) comprises an inner tube (40) positioned in the intermediate portion (32), wherein the inner tube (40) comprises a main body (144) and opposite first and second end portions (48) extending inwardly from the main body (144).

2.2 As discussed above under point 1, the support ring 10 in E2 corresponds to an annular heat shield positioned in the intermediate portion as defined in claim 1 of the main request. As can be seen in Figure 1 of E2, the support ring 10 is positioned radially inside the tube and the mat 2 and thus corresponds to an inner tube 40. It further has a main body and opposite first and second end portions (see e.g. "Stirnkanten", column 4, lines 17 to 26 and Figure 1). The added feature is thus already disclosed in E2 used as the closest prior art for the consideration of inventive step and thus this added feature cannot contribute to providing an inventive step.

2.3 Thus, for the same reasons as apply to the main request, the subject-matter of claim 1 of auxiliary
request 1 also does not involve an inventive step. Auxiliary request 1 is thus not allowable.

3. Request for referral of two questions to the Enlarged Board of Appeal

3.1 The appellant requested the referral of two questions to the Enlarged Board of Appeal under Article 112(1)(a) EPC (see point VIII. above)

3.2 It is first noted that Article 112(1) EPC provides for the Enlarged Board of Appeal only to have questions referred to it by a Board of Appeal in order to ensure uniform application of the law, or if a point of law of fundamental importance arises. Concerning the issues at hand, the Enlarged Board of Appeal has already clearly defined the general principles which govern the requirements of Article 123(2) EPC inter alia in G 2/98 and G 2/10, i.e. that the skilled person must be able to derive the claimed subject-matter directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the original application as a whole.

3.3 Secondly, the referred question must not have a merely theoretical significance for the proceedings in the case to be decided, which would for example be the case if the referring Board were to reach the same decision regardless of the answer to the referred question (see G 3/98, item 62, and G 2/99, item 83).

3.4 Regarding the "U.S. style" claim dependency, the Board notes that there is no actual limitation regarding the possible combinations of features in the claims of a U.S. application. 35 U.S.C 112 allows multiple dependent claims to be drafted and states only that a
multiple dependent claim shall not serve as a basis for any other multiple dependent claim. Contrary to the argument of the appellant, this is however not an absolute prohibition or even an insurmountable limitation, as it could be overcome, merely for example, by the use of several independent claims in the same category and/or by redrafting of the dependent claims accordingly.

3.5 The Board also notes that in the present case the relevant dependent claims do not refer back to the independent claim separately in the way that "U.S. style" dependency is defined in question 1. For example, originally filed claims 16 and 17 refer back to originally filed dependent claim 15.

3.6 The further argument from the appellant that such an approach (the use of multiple dependent claims) would involve high cost, also does not constitute a (legal) limitation to the rights of the party. Thus, the Board cannot recognize any dependency "style" or any other reason that could change its way of assessing the compliance with Article 123(2) EPC referred to above under point 3.2.

3.7 The appellant further argued that, in cases where the amended claim was a combination of features containing features from originally filed dependent claims that did not respect the original dependency, the existence of an embodiment in the disclosure containing all the combined features (albeit with even more features) should be enough to fulfill the requirement of Article 123(2) EPC and this was a relevant point of law in which Boards diverged considerably. The appellant pointed to an alleged contradiction between T 2619/11 and T 1414/11.
3.7.1 The Board is not persuaded by this argument and finds that the criteria stated in point 3.2 are the necessary and sufficient criteria to assess the requirement of Article 123(2) EPC. The claimed subject-matter, i.e. the claimed combination of features, must be clearly and unambiguously derivable from the whole content of the application as originally filed. If the combination of originally filed claims alone does not fulfill this criteria, it must be established whether this combination of features is derivable from any other part of the application as filed. This criteria is valid, irrespective of the particular dependency structure of the originally filed claims.

3.7.2 In T 1414/11 (see Reasons 2.2.2 and 2.2.3), the Board found that the first sentence of the fourth paragraph of page 5 in the description directly and unambiguously enabled the skilled person reading the application to derive that the binding agent with graphite particles was applicable to all the carbon and graphite layers of the invention, including the layer materials of dependent claims 2 and 3 and thus provided the basis for the combination of features of dependent claims 2 and 3 with the amended claim 1.

3.7.3 In T 2619/11 (see Reasons 2.5 to 2.9), the Board found that what was directly and unambiguously disclosed for the skilled person reading the application was that the tapered portion of the tube with the features of Figure 3 could extend over "the entire length" of the tube, which was the same as "the whole length" defined in the original claims, and that "substantially the whole length" was a more specific embodiment of "at least a substantial portion" and not an alternative thereto. The Board thus came to the conclusion that the
Examining Division had made a mistake by focusing disproportionately on the claim structure of the original application and not on what the skilled person would clearly and unambiguously derive from the application as a whole (see also T 1629/15, Reasons 2.10.2).

3.7.4 The Board thus concludes that both decisions rely on the (same) criteria mentioned above in point 3.2 and do not contradict each other.

3.8 Thus, the Board came to the conclusion that a referral to the Enlarged Board of Appeal was not justified. The Board thus refused the request for referral.

4. Auxiliary requests 2-4 - Article 123(2) EPC

4.1 Claim 10 of auxiliary requests 2 to 4 defines inter alia that the catalytic converter comprises an oxygen sensor secured to the intermediate position. This feature was defined in the originally filed claim 14 which depended directly from independent claim 13 and was not linked to any other claim depending from independent claim 13, such as claims 15 and 17, which the appellant also provided as a basis for the subject-matter of claim 10.

4.2 The appellant argued that although no combination of dependent claims provided the specific combination of features of claim 10 of any of auxiliary requests 2 to 4, the embodiment of Figures 5 to 7 comprised all the features of claim 10 of auxiliary requests 2 to 4 and thus provided a basis for the respective combination of features.
The Board does not accept this. The description relating to the embodiment of Figures 5 to 7 on page 5, line 18, to page 6, line 4, does not disclose an oxygen sensor. Only Figures 5 to 7 disclose an oxygen sensor. The oxygen sensor and its positioning disclosed in these Figures is however more specific than the one defined generally in claim 10 of auxiliary requests 2 to 4. For example, it is secured to the intermediate portion through a sensor mount 36 that is not defined in claim 10 of any of auxiliary requests 2 to 4.

4.3 The appellant argued that the claimed oxygen sensor was not defined in further detail because it was not relevant for the invention, but the Board does not find this argument convincing. Figures 5-7 disclose an oxygen sensor with certain specific features and in the whole of the disclosure it is nowhere stated that such an oxygen sensor or any part of it is less relevant or can for example be left out. Thus, in the absence of any information to the contrary, the skilled person would only directly and unambiguously derive an oxygen sensor with more specific features (such as the sensor mount mentioned above) than defined in claim 10 of auxiliary requests 2 to 4, when using Figures 5 to 7 as the basis.

4.4 For the reasons stated above, the subject-matter of claim 10 of auxiliary requests 2, 3 and 4 extends beyond the content of the application as originally filed and the requirement of Article 123(2) EPC is thus not fulfilled. Consequently, auxiliary requests 2, 3 and 4 are not allowable.
Order

For these reasons it is decided that:

1. The request for referral of questions to the Enlarged Board of Appeal is refused.

2. The appeal is dismissed.

The Registrar:                The Chairman:

M. H. A. Patin              M. Harrison

Decision electronically authenticated