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Datasheet for the decision of 18 September 2017

Case Number: T 1635/14 - 3.2.08

Application Number: 06704434.7

Publication Number: 1981682

IPC: B23K35/28, B23K35/02, C23C26/02, B23K35/365

Language of the proceedings: EN

Title of invention:
A PROCESS FOR MAKING A HEAT EXCHANGER

Patent Proprietor:
Sapa AS

Opponents:
MAHLE Behr GmbH & Co. KG
Faller, Kurt

Headword:

Relevant legal provisions:
EPC Art. 100(b), 83
RPBA Art. 13(1), 13(3)

Keyword:
Sufficiency of disclosure - (no)
Late-filed auxiliary requests - admitted (no)

Decisions cited:
G 0004/95

Catchword:

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Case Number: T 1635/14 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 18 September 2017

Appellant: (Opponent 1)	MAHLE Behr GmbH & Co. KG Mauserstr. 3 70469 Stuttgart (DE)
Representative:	Grauel, Andreas Grauel IP Patentanwaltskanzlei Wartbergstrasse 14 70191 Stuttgart (DE)
Respondent: (Patent Proprietor)	Sapa AS Biskop Gunnerusgate 14 0185 Oslo (NO)
Representative:	Zacco Sweden AB P.O. Box 5581 114 85 Stockholm (SE)
Appellant: (Opponent 2)	Faller, Kurt Traubinger Strasse 18A 82340 Feldafing (DE)
Representative:	Kramer Barske Schmidtchen Patentanwälte PartG mbB European Patent Attorneys Landsberger Strasse 300 80687 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 26 May 2014 rejecting the opposition filed against European patent No. 1981682 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chair	P. Acton
Members:	M. Foulger
	Y. Podbielski

Summary of Facts and Submissions

I. With the decision posted on 26 May 2014, the opposition division rejected the oppositions filed against European patent no. 1 981 682. The opposition division found that the grounds of opposition under Articles 100(a) and (b) EPC did not prejudice the maintenance of the patent as granted.

II. Appellant 1 (Opponent 1) and Appellant 2 (Opponent 2) filed appeals against this decision. The appeals were filed within the given time limits and in due form.

III. Oral proceedings took place before the Board on 18 September 2017.

IV. Appellants 1 and 2 request that the decision under appeal be set aside and the patent be revoked. Appellant 2 requests that Mr Nordlien not be permitted to speak during the oral proceedings as an expert. Appellants 1 and 2 request that auxiliary requests 1, 2, 3, 8 and 9 not be admitted into the proceedings.

The respondent requests that the appeal be dismissed or, in the alternative, that a patent be maintained on the basis of one of auxiliary requests 1-3 filed during the oral proceedings, auxiliary requests 4-7 filed with the reply to the statements setting out the grounds of appeal, or auxiliary requests 8 or 9 filed during the oral proceedings. The respondent requests that Mr Nordlien be permitted to speak during the oral proceedings as an expert. The respondent also requests that documents O11 (A Baldantoni et al., "NOCOLOK^{TM} Sil Flux - A Novel Approach for Brazing Aluminium", SAE 940502, §1994), O13 (A.L.Dons et al., "Homogenisation of AA3103 and AA3003, Part II: Heating", ALUMINIUM,

Vol. 81, November 2005) and O14 (F.R.Boutin et al., "Thermoelectrical Power: A hand for metallurgists", 7th Int. Light Metals Congress Leoben/Vienna 1981) not be admitted into the proceedings.

V. Claim 1 as granted reads:

"A process for making a heat exchanger comprising extruding a number of heat exchanging tubes, connecting the end portions of the heat exchanger tubes with connection elements, and optionally applying fins to the outer surface of the heat exchanging tubes, in which prior to the assembling of the heat exchanger the tubes are provided with a Si-containing coating, and after assembling the different element are brazed together, **characterized in that** heat exchanging tubes are made of an aluminium alloy containing:
0,45 - 1,40 % by weight Mn
where the amount of Mn in solid solution is at least 0,4 % by weight,
0,00 - 0,20 % by weight Si
0,00 - 0,30 % by weight Fe
0,00 - 0,45 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,30 % by weight Cr
the remainder aluminium and where unavoidable impurities is set to a maximum of 0,05 % by weight."

Auxiliary request 1

Claim 1 is further restricted over the main request by the addition of the feature that "the Si-containing coating is an organic coating containing flux and Si".

Auxiliary request 2

Claim 1 is further restricted over the main request by the addition of the feature that "the Si-containing coating is applied by means of spray coating, dip coating roll coating, roll transfer printing pad printing or screen- printing techniques".

Auxiliary request 3

Claim 1 is further restricted over auxiliary request 1 by the addition of the feature that the Si-containing coating is "applied by means of spray coating, dip coating roll coating, roll transfer printing pad printing or screen- printing techniques".

Auxiliary request 4

Claim 1 restricted over claim 1 of the main request by the feature that "the Si-containing coating contains at least 2 g/m^2 Si".

Auxiliary request 5

Claim 1 is further restricted over claim 1 of auxiliary request 4 by "at most 25 g/m^2 Si".

Auxiliary request 6

Claim 1 is further restricted over claim 1 of the main request by the feature "that the Si-containing coating contains at least 4 g/m^2 Si and/or less than 8 g/m^2 Si".

Auxiliary request 7

Claim 1 of this request is further restricted over claim 1 of auxiliary request 6 by the features:

"the aluminium alloy contains :
a) 1,25 - 1,40 % by weight Mn
0,00 - 0,50 % by weight Si
0,00 - 0,25 % by weight Fe
0,00 - 0,30 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,30 % by weight Cr
or
b) 0,90 - 1,25 % by weight Mn
0,00 - 0,40 % by weight Si
0,00 - 0,25 % by weight Fe
0,00 - 0,30 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,25 % by weight Cr
or
c) 0,65 - 0,90 % by weight Mn
0,00 - 0,30 % by weight Si
0,00 - 0,25 % by weight Fe
0,00 - 0,35 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,15 % by weight Cr
or
d) 0,45 - 0,65 % by weight Mn
0,00 - 0,20 % by weight Si
0,00 - 0,25 % by weight Fe
0,00 - 0,45 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,10 % by weight Cr."

Auxiliary request 8

Claim 1 is further restricted over claim 1 of the main request by the feature that "during brazing various elements will diffuse from the (molten) clad into the core and vice versa, resulting in a diffusion zone between the clad and the core, the diffusion zone having a manganese solid solution concentration gradient with a lower corrosion potential than the core".

Auxiliary request 9

Claim 1 is further restricted over claim 1 of auxiliary request 8 by the feature that "the thickness of the diffusion zone is around 40 to 80 µm".

VI. The following documents are referred to in this decision:

E2: US 5 041 343 A
O9: P.Furrer, "Gefügeänderungen bei der Wärmebehandlung von Al-Mn-Stranggußbarren", Zeitschrift für Metallkunde, 1979
012: A.L.Dons et al., "Homogenisation of AA3103 and AA3003, Part I: The initial structure of AA3003", ALUMINIUM, Vol. 81, November 2005

VII. The appellants argued essentially the following:

a) Request for an expert to speak before the Board

The respondent had not indicated the subject-matter of Mr Nordlien's submissions. Hence, the appellant had neither an opportunity to prepare a response nor of proposing their own expert. This request was therefore

to be rejected in accordance with G 4/95.

b) Main request - Sufficiency of disclosure

The patent did not contain any teaching that enabled the skilled person to achieve 0.4% manganese in solid solution over the full scope of the claim. The composition of the heat exchanger tubes given in the claim was a complex alloy which potentially included high levels of silicon and iron. These elements form intermetallic compounds with manganese so it was to be expected that a significant amount of manganese was not in solid solution, see patent, col. 3, l. 17-21, E2, col. 3, l. 20-23, as well as O9, p. 700, l.h.col., first two paragraphs.

As the patent did not contain any example of the invention, the burden of proof was on the respondent to show that the invention could be carried out over its full scope.

The examples filed with the reply to the appeal and the letter dated 18 August 2017, as well as the disclosure of O12, did not show that it was possible to achieve 0.4% manganese in solid solution when the alloy contained 0.45% manganese by weight and 0.3% Fe and 0.2% Si by weight.

The teaching that the step of homogenisation could be omitted was in the section relating to the prior art, and did not relate to any specific example of the invention. This teaching did not therefore enable the invention to be carried out over its full scope.

Therefore, the respondent had not discharged their burden of proof and, consequently, the patent did not

disclose the invention in a manner sufficiently clear and complete for it to be carried out by the skilled person.

c) Auxiliary requests 1-3,8,9

These requests were filed during the oral proceedings and, hence, were late-filed. The claims of these requests included features taken from the description to which the appellants could not reasonably react during the oral proceedings. Moreover, these requests did nothing to overcome the problem of lack of enablement of the main request and were thus *prima facie* unallowable.

Hence, these requests were not to be admitted into the proceedings.

d) Auxiliary requests 4-7

The arguments presented for the main request also applied to these requests.

VIII. The respondent argued essentially the following:

a) Request for an expert to speak before the Board

The request for Mr Nordlien to speak had been filed one month before the oral proceedings which gave sufficient time for the appellants to prepare. Mr Nordlien should therefore be allowed to speak.

b) Main request - Sufficiency of disclosure

The patent did disclose how to carry out the invention in that it explained that the usual homogenisation step

was to be omitted, see patent col. 3, l. 34-36. Without this step, the manganese remained in solid solution. Moreover, the examples provided with the reply to the appeal and the letter dated 18 August 2017 showed that 0.4% by weight of manganese in solid solution was achievable. This was also shown by O12 - see fig. 2.

E2, col. 6, example 2 demonstrated that homogenisation was detrimental for the corrosion resistance and hence that, in this way, the amount of manganese in solid solution could be controlled.

The invention was therefore described in a manner sufficiently clear and complete for it to be carried out by the skilled person.

c) Auxiliary requests 1-3,8,9

These requests were filed in order to overcome possible objections under Article 56 EPC. They should therefore be admitted.

d) Auxiliary requests 4-7

The arguments presented for the main request also applied to these requests.

Reasons for the Decision

1. Request for an expert to speak before the Board

According to the decision G 4/95 (OJ 1996, 412) oral submissions by an accompanying person in opposition or opposition appeal proceedings cannot be made as a matter of right, but only with the permission and at the discretion of the board. One of the criteria that the Board should apply when exercising its discretion was whether the request specified the subject-matter of the proposed oral submissions (see Order, 3(b)(i)).

In the present case, with their letter dated 18 August 2017, the Respondent had informed the Board of their request that Mr Nordlien be allowed to make presentations during the oral proceedings. This request did not, however, state the subject-matter of the proposed oral submissions and the appellant was thus neither able to prepare a response nor to propose their own expert. In these circumstances it is irrelevant that the request was made well in advance of the oral proceedings The Board therefore refused this request.

2. Main request - Sufficiency of disclosure (Article 100(b) EPC)

According to the established case law of the Boards of Appeal, the burden of proof is upon the opponent to establish on the balance of probabilities that a skilled reader of the patent, using their common general knowledge would be unable to carry out the invention (Case Law of the Boards of Appeal, 8th Edition, 2016, II.C.8, p. 362, final paragraph). However when the patent does not give any information

as to how a feature of the invention can be put into practice, only a weak presumption exists that the invention is sufficiently disclosed (Case Law of the Boards of Appeal, 8th Edition, 2016, II.C.8, p.363).

The characterising part of claim 1 states that the heat exchanging tubes are made of an aluminium alloy containing:
0,45 - 1,40 % by weight Mn
where the amount of Mn in solid solution is at least 0,4 % by weight,
0,00 - 0,20 % by weight Si
0,00 - 0,30 % by weight Fe
0,00 - 0,45 % by weight Cu
0,00 - 0,05 % by weight Mg
0,00 - 0,30 % by weight Cr
the remainder aluminium and where unavoidable impurities is set to a maximum of 0,05 % by weight.

It is correct that the description discloses that keeping the manganese in solid solution may be achieved by omitting the homogenisation step after casting, see patent, col. 3, l. 34-37. However, this teaching is not related to any particular composition and is to be found in the section dealing with the prior art. Moreover, the description lacks any specific example of the invention given nor does it disclose how the claimed ranges can be obtained.

From E2, col. 3, l. 20-23, it is known that high levels of silicon can prevent manganese from resting in solid solution (cf patent col. 3, l. 17-20). Moreover, the presence of iron encourages the formation of intermetallic compounds that reduce the amount of manganese in solid solution, see O9, p. 700, l.h.col., first two paragraphs.

With alloys having only 0.45% by weight manganese, it is necessary that 89% of this manganese stays in solid solution in order to achieve the claimed value of 0.4% by weight of manganese in solid solution. The presence of silicon or iron will however tend to encourage the formation of intermetallic compounds and thus reduce the amount of manganese that is available to rest in solid solution. This is particularly critical when there is only 0.45% by weight manganese in the alloy combined with high amounts of silicon and iron - the claimed ranges extend up to 0.20% Si by weight and 0.30% Fe by weight.

Hence, there is a strong element of doubt that it is possible to achieve a level of 0.4% by weight manganese in solid solution over all the claimed compositions. The appellants have thus shown that there are well-founded doubts that the claimed invention can be carried out over its full range. The burden of proof is therefore reversed.

The example provided by the respondent with the letter dated 18 August 2017 shows that a solid solution level of 0.41% manganese could be obtained for a commercial Sapa 9170 alloy having 0.46% by weight of manganese. During the oral proceedings, the respondent stated that this alloy contained 0.06% Si by weight and 0.1% Fe by weight, i.e. much less than the 0.2% by weight of Si or the 0.3% by weight of Fe at the upper end of the claimed range for these elements. Thus this example does not show that the invention can be carried out over the whole range claimed.

The examples shown in the reply to the statement of grounds of appeal dated 9 April 2015, see figure on p.

4, have respectively 0.7% and 1% by weight of manganese. Thus these examples are also not suitable to demonstrate that the invention claimed can be carried out for compositions having levels of manganese at the lower end of the claimed range.

Consequently, neither the information contained in the patent itself, namely that homogenisation should be omitted, nor the evidence submitted by the respondent in the appeal proceedings are sufficient to overcome the above doubts.

Given the above, the Board concludes that the patent, even in combination with the skilled person's knowledge, does not describe the invention in a manner sufficiently clear and complete for it to be carried out over the whole range claimed.

3. Auxiliary requests 1-3,8,9

These requests were presented during the oral proceedings. Their admittance is therefore at the discretion of the Board (Article 13(1) and (3) RPBA).

According to the respondent, these requests were filed in order to overcome objections under Article 56 EPC. They do not add anything to the claims which could overcome the objection under sufficiency of disclosure and are thus *prima facie* not allowable. Moreover, since they are based on features which have been disclosed only in the description, the Appellants could not reasonably be expected to deal with the issues raised during the oral proceedings.

These requests were therefore not admitted into the

proceedings.

4. Auxiliary requests 4-7

As the subject-matter of claim 1 of all of these requests comprises the requirement that at least 0.4% Mn by weight is in solid solution along with compositions having 0.45% Mn by weight and up to 0.20% by weight silicon and 0.30% by weight iron, the above reasoning concerning the main request is directly applicable to these requests. Thus the inventions defined by the independent claim of these requests are also not disclosed in a manner sufficiently clear and complete for them to be carried out by a person skilled in the art.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chair:

C. Moser P. Acton

Decision electronically authenticated