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**Datasheet for the decision
of 28 July 2022**

Case Number: T 1083/19 - 3.3.05

Application Number: 07831266.7

Publication Number: 2103580

IPC: C04B35/043, C04B35/634,
C21C5/46, C22C29/12, F27D1/00,
B22F3/24

Language of the proceedings: EN

Title of invention:
DURABLE SLEEVE BRICKS

Patent Proprietor:
Krosakiharima Corporation

Opponent:
Refractory Intellectual Property GmbH & Co. KG

Headword:
DURABLE SLEEVE BRICKS/Krosakiharima

Relevant legal provisions:
RPBA Art. 12(4)
EPC Art. 123(2), 84, 83, 54, 56

Keyword:

Late-filed facts - request could have been filed in first instance proceedings (yes)

Amendments - allowable (yes)

Claims - clarity (yes)

Sufficiency of disclosure - (yes)

Novelty - (yes)

Inventive step - main request (no)

Decisions cited:

G 0003/14, T 1799/08

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1083/19 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 28 July 2022

Appellant: Refractory Intellectual Property GmbH & Co. KG
(Opponent) Wienerbergstrasse 11
1100 Wien (AT)

Representative: Berkenbrink, Kai-Oliver
Patentanwälte Becker & Müller
Turmstrasse 22
40878 Ratingen (DE)

Respondent: Krosakiharima Corporation
(Patent Proprietor) 1-1, Higashihama-machi
Yahatanishi-ku
Kitakyushu-shi
Fukuoka 806-8586 (JP)

Representative: Vossius & Partner
Patentanwälte Rechtsanwälte mbB
Siebertstrasse 3
81675 München (DE)

Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
31 January 2019 concerning maintenance of the
European Patent No. 2103580 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: J. Roider
O. Loizou

Summary of Facts and Submissions

I. The appeal lies from the opposition division's interlocutory decision to maintain the patent in amended form on the basis of the then auxiliary request 1, filed during the oral proceedings before the opposition division.

II. The following documents already cited in the decision under appeal are also relevant here:

D1 EP 0 249 647 A1

D8 "Taschenbuch Feuerfeste Werkstoffe", G. Routschka, Vulkan-Verlag, 1996, pp. 138-153

III. In appeal proceedings the proprietor (respondent) submitted, with the reply to the grounds of appeal, the set of claims maintained by the opposition division as its main request and additionally filed auxiliary requests 1 to 5, including auxiliary request 3, corresponding to auxiliary request 3 submitted on 18 December 2018 in opposition proceedings.

IV. The claims relevant to the decision read as follows:

(a) Claim 1 of the main request reads:

"1. A high-durability magnesia-carbon based sleeve brick obtainable by adding, to a refractory raw material mix containing 60 to 95 mass% of a magnesia raw material and 5 to 20 mass% of graphite, a metal powder which is Al in an amount of greater than 3 to 6 mass%, and an organic binder, in addition to 100 mass% of the refractory raw material mix, and subjecting the resulting

mixture to kneading, forming and heat treatment, wherein the sleeve brick has a thickness of 70 mm or less, wherein the thickness of the sleeve brick means a thickness of a thinnest portion thereof; when the sleeve brick has a tapered portion, the thickness of the sleeve brick means a minimum thickness of the remaining portion other than the tapered portion; when the inner bore is tapered over an overall length thereof, the thickness of the sleeve brick means a minimum thickness in a region where the inner bore is narrowed; and when there is a step inside the inner bore, the thickness of the sleeve brick means a minimum thickness in a region of the inner bore having a smaller diameter; and wherein during use, the metal in the refractory product is transformed into an oxide, and the metal oxide is expanded in volume through a reaction with magnesia."

- (b) Auxiliary request 1 contains the following amendments compared with the main request (amendments marked):

"... , a metal powder ~~which is~~ of one or more selected from the group consisting of Al, Si, Mg, Ca, Cr and an alloy thereof, in an amount of greater than 3 to 6 mass%, the metal powder being Al, ..."

- (c) Auxiliary request 2 contains the following amendments compared with the main request (amendments marked):

" ... in a region of the inner bore having a smaller diameter; and wherein during use, the metal in the refractory product is transformed into an oxide, and the metal oxide is expanded in volume through a reaction with

magnesia, and wherein the sleeve brick has an overall length of 700 to 3000 mm."

(d) Claim 1 of auxiliary request 3 reads as follows (amendments compared with the main request are marked):

" ... in a region of the inner bore having a smaller diameter; and wherein during use, the metal in the refractory product is transformed into an oxide, and the metal oxide is expanded in volume through a reaction with magnesia, and wherein the magnesia raw material comprises a first particle fraction having a particle diameter of greater than 10 to 500 μm and occupying 20 to 50 mass% in the refractory raw material mix, and a second particle fraction having a particle diameter of 10 μm or less and occupying 5 mass% or less in the refractory raw material mix."

The only other claim, dependent claim 2, relates to a particular embodiment of the invention.

V. The opponent (appellant) argued in the statement of grounds of appeal that the main request did not fulfil the requirements of Articles 123(3), 54 and 56 EPC. In its letter dated 20 December 2019, the appellant argued, *inter alia*, that the wording of claim 1 of auxiliary request 1 was not clear, that the subject-matter of the second auxiliary request did not involve an inventive step and that the third auxiliary request was not to be admitted and did not meet the requirements of Articles 123(2) and (3), 83, 54 and 56 EPC.

- VI. In its communication under Article 15(1) RPBA, the board expressed the preliminary opinion that the patent could possibly be maintained on the basis of auxiliary request 3.
- VII. Subsequently, both parties withdrew their requests to hold oral proceedings provided that the board did not deviate from this preliminary opinion. Since the board saw no reason to deviate from this, the proceedings were continued in writing and a decision is issued herewith.
- VIII. Requests with regard to the substance:
- (a) The appellant requested that the decision under appeal be set aside and that the patent be revoked.
 - (b) The respondent requested that the appeal be dismissed (main request) or, in the alternative, that a patent be maintained in amended form based on one of auxiliary requests 1 to 5, filed with the reply to the appellant's statement of grounds of appeal.

Reasons for the Decision

- 1. Main request
 - 1.1 Amendments, Article 123(3) EPC
 - 1.1.1 Admission into the appeal proceedings

An objection under Article 123(3) EPC was not raised in the proceedings leading to the decision under appeal.

It was first raised in the statement of grounds of appeal.

The appellant did not submit reasons and it is not apparent why this objection could not have been raised as it should have been during the oral proceedings before the opposition division (Article 12(4) RPBA 2007).

Therefore, the objection under Article 123(3) EPC is not admitted into the proceedings.

1.2 Novelty, Article 54(1) and (2) EPC

1.2.1 Admission into the appeal proceedings

In the statement of grounds of appeal, the appellant argued, under Article 56 EPC, on page 8 that D1 was to be considered to anticipate the novelty of the subject-matter of claim 1 and it elaborated on this objection in the letter dated 20 December 2019.

During the proceedings before the opposition division leading to the decision under appeal, the objection under Article 54(1) and (2) EPC was explicitly withdrawn (see impugned decision, point 6.1 and minutes of the oral proceedings before the opposition division, points 17 and 23).

The new objection is based on the assumptions that D1 did implicitly disclose the addition of graphite and the use of organic binders.

Moreover, the appellant refers to a number of passages in D1 (see page 6 of the statement of grounds of appeal), which allegedly disclose the combination of a

number of parameters contained in the subject-matter of claim 1.

For the aspects relating to the implicit disclosure, the appellant offered to provide additional evidence in the form of an expert opinion.

The features relating to the allegedly implicit disclosure were already contained in the patent as granted. Hence, the objection could and should already have been raised and substantiated in the opposition proceedings.

The primary object of appeal proceedings is to review the decision under appeal in a judicial manner. The allegation of implicit disclosure and the offer of additional evidence yet to be filed adds considerable complexity and causes delays, and is not expedient to the proceedings at the appeal stage.

For these reasons, the objection is thus held inadmissible (Article 12(4) RPBA 2007).

1.3 Inventive step, Article 56 EPC

1.3.1 The patent is directed to a sleeve brick for steelmaking converters.

1.3.2 The appellant cited D1, *inter alia*, as constituting the closest prior art.

D1 is directed to a refractory spout of a steel converter and thus qualifies as a suitable starting point for an objection under Article 56 EPC.

1.3.3 The respondent states the problem in view of D1 as being that of providing an improved magnesia-carbon based sleeve brick, which is less susceptible to splitting or cracking due to physical effects even though it has reduced thickness (page 11 of the reply to the grounds of appeal).

1.3.4 Claim 1 is a product-by-process claim, thus defining the sleeve brick in terms of the method for its production, which involves a number of steps. One of these steps is the addition of a metal powder of a specific composition.

However, the steps of the method are not restricted to those specified in the subject-matter of claim 1. Indeed, the subject-matter of claim 1 does not preclude further steps of adding metal powders, including metal powders of the very same composition.

The claimed step of adding the specific metal powder merely ensures that the resulting sleeve brick contains Al in a certain overall minimum amount.

Apart from that requirement, the amount and type of the added metal is not restricted. Indeed, the total amount of Al in the final product may exceed the amount defined for Al in the specific step defined in the subject-matter of claim 1. In addition Si, Mg, Ca and Cr may be present.

Therefore, the subject-matter of claim 1 does not define an upper limit for the metal powder content of the product.

Comparative Example 1 (Table 2, paragraph [0051]) shows that the addition of 7% metal powder deteriorates the

usable limit by 29% due to a deterioration in thermal shock resistance.

- 1.3.5 Therefore the problem stated by the respondent is not solved over the claimed range and must be reformulated into a less ambitious problem, which is to provide an alternative.
- 1.3.6 D1 discloses the addition of up to 25% carbon (column 5, line 21) and the addition of Si, Al or Mg in an amount of 2-5% (paragraph bridging columns 6 to 7), while the subject-matter of claim 1 requires, *inter alia*, 5-20% graphite and a minimum addition of 3% aluminium.

The materials disclosed in D1 and their content in the product thus partly overlap with the subject-matter of claim 1.

However, D1 neither discloses the kind of carbon added to the refractory raw material mix nor mentions a binder.

Contrary to the respondent's opinion, D1 does not provide teaching leading away from the use of aluminium for carbon-rich material. The passage to which the respondent is referring (column 6, line 52 to column 7, line 13) merely discloses that the addition of metal improves the oxygen resistance of the carbon fraction in the refractory material. For low-carbon material, the addition of metal improves the wear resistance.

According to D8, which is a handbook of refractory materials, in magnesia-carbon bricks, a high amount of residual carbon can only be achieved by adding graphite (last lines on page 148).

The opposition division questioned that statement by referring to the first line on page 150.

However, this passage must be considered in the context of the last lines on page 149. When considered in the appropriate context, it becomes apparent that D8 discloses a convenient classification of refractory bricks according to the binder used. A first category includes bricks with pitch binders containing up to 15% carbon and the second category includes bricks with resin binders containing up to 25% carbon. It does not state that the origin of the carbon is the resin binder, as was apparently assumed by the opposition division (see impugned decision, paragraph 6.14).

Table 13 also classifies the products according to the types of binder, but it does not contradict the statement in the last lines on page 148, because the addition of graphite is simply not mentioned.

The fact that aluminium might reduce the temperature shock resistance when it is acting as an antioxidant does not mean that it would offset the effect of graphite and that the skilled person would be discouraged from using aluminium even for alternative purposes (see impugned decision, paragraph 6.14).

An assessment as to whether inorganic binders also exist for the present purpose, as purported by the respondent, must be made in view of the problem, which is to provide an alternative.

Pitch or phenol resin are commonly used as a binder (D8, pages 147-150) and would be taken into consideration by the skilled person.

- 1.3.7 In view of the problem of providing an alternative product, the skilled person would therefore consider working in the overlapping ranges as outlined above, selecting aluminium as the metal powder, using graphite as the carbon source and using an organic binder.

The requirements of Article 56 EPC are thus not fulfilled.

2. Auxiliary request 1

2.1 Clarity, Article 84 EPC

- 2.1.1 The appellant argues that it was unclear how a metal powder could consist of one or more of Al, Si, Mg, Ca and Cr while the metal powder was actually only aluminium.

- 2.1.2 In opposition proceedings, Article 84 EPC may be examined only to the extent that the amendment introduces the non-compliance (see G3/14, Order). Insofar as the appellant's objection relates to the feature of "the metal powder being Al,", the requirements of Article 84 EPC may hence be examined.

- 2.1.3 While the claim first allows for a selection, the amendment then requires that nothing except for aluminium may be selected. The added feature thus introduces a contradiction.
It is indeed not apparent how metals other than aluminium could be selected from the group consisting of Al, Si, Mg, Ca, Cr and an alloy thereof if the metal powder is actually only aluminium.

Therefore, the requirements of Article 84 EPC are not fulfilled.

3. Auxiliary request 2

3.1 Inventive step, Article 56 EPC

The amendment to auxiliary request 2 further specifies the length of the sleeve brick.

However, claim 10 of D1 discloses that the refractory element has a length of 2000 mm, thus anticipating this feature.

The subject-matter of claim 1 thus lacks an inventive step for the reasons stated for the main request.

4. Auxiliary request 3

4.1 Admission

The appellant objected that the amendments introduced in auxiliary request 3 lacked convergence and therefore were not to be admitted.

The combination of features corresponds to the combination of claims 1 and 3 as maintained by the opposition division and also corresponds to auxiliary request 3 submitted on 18 December 2018 in the opposition proceedings.

The board therefore sees no reason to hold auxiliary request 3 inadmissible.

4.2 Amendments, Article 123(3) EPC

The objection under Article 123(3) EPC is made with reference to the objection to the main request submitted in the statement of grounds of appeal. It thus relies on the same facts and arguments.

Therefore, this objection is not admitted for the reasons as outlined above for the main request.

4.3 Amendments, Article 123(2) EPC

For the objection under Article 123(2) EPC, the appellant relies on paragraph [0029] of the A1 publication (corresponding to page 7, second paragraph of the translated description). The appellant argues that, according to this reference, the particle size related to "*a raw material*" but not to magnesia, as required in claim 1.

However, the features added to the subject-matter of claim 1 were already contained in the original dependent claim 3. No arguments were provided as to why the combination of the original claim 3 with the amendments to claim 1 infringed the requirements of Article 123(2) EPC or why such non-compliance is obvious.

The requirements of Article 123(2) EPC are thus not considered to be infringed.

4.4 Sufficiency of disclosure, Article 83 EPC

The appellant argues that the feature "*a particle diameter of greater than 10 to 500 μm* " rendered the

patent insufficiently disclosed.

The subject-matter of claim 1 of the main request already contains the feature "*greater than 3 to 6 mass%*". In view of paragraph [0023] of the patent in suit, it expresses "*greater than 3, **up** to 6 mass%*".

In view of the whole description, the expression objected to merely lacks clarity and should read "a particle diameter of greater than 10, **up** to 500 μm ".

The objection thus does not relate to sufficiency of disclosure, but to a lack of clarity already contained in the claims as granted.

4.5 Novelty, Article 54(1) and (2) EPC; inventive step, Article 56 EPC

The appellant made the objections under Articles 54(1) and (2) and 56 EPC, with reference to the objections to the main request, which were filed with the statement of grounds of appeal and the letter dated 20 December 2019.

However, with respect to claim 3 of the main request, the statement of grounds of appeal only contains a general reference to the proceedings leading to the decision under appeal on page 23, but does not contain reasoning dealing with the features at issue.

Therefore, the objections under Article 54(1) and (2) EPC and Article 56 EPC to claim 1 of auxiliary request 3 are not properly substantiated. In view of the character of the *inter partes* appeal proceedings, it cannot be expected that the board fully investigates

these grounds, in breach of the principle of equal treatment of the parties, and provides on its own, an elaborate and full reasoning, substituting itself for the opponent.

The board thus accepts the patent proprietor's arguments (see T 1799/08, points 10 to 12 of the Reasons).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of auxiliary request 3, filed with the reply to the appellant's statement of grounds of appeal, and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated