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**Datasheet for the decision
of 27 September 2023**

Case Number: T 0103/22 - 3.3.05

Application Number: 14852445.7

Publication Number: 3055271

IPC: C04B35/64, C04B35/622,
C04B33/00, F27B9/26, F27D5/00,
F27D3/00

Language of the proceedings: EN

Title of invention:
REFRACTORY SUPPORT STRUCTURE ARTICLE

Patent Proprietor:
Saint-Gobain Ceramics & Plastics, Inc.

Opponent:
Schunk Ingenieurkeramik GmbH

Headword:
Firing support structure/Saint-Gobain Ceramics & Plastics

Relevant legal provisions:
EPC Art. 123(2), 83, 54, 56
RPBA 2020 Art. 12(4)

Keyword:

Amendments - allowable (yes)

Sufficiency of disclosure - (yes)

Novelty - (yes)

Inventive step - non-obvious alternative

Amendment to case - new document - admitted (no)

Decisions cited:

T 2001/12, G 0001/03

Catchword:



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Case Number: T 0103/22 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 27 September 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
15 November 2021 concerning maintenance of the
European Patent No. 3055271 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: S. Besselmann
R. Winkelhofer

Summary of Facts and Submissions

I. The opponent's (appellant's) appeal in this case is against the opposition division's interlocutory decision that European patent EP 3 055 271 B1 on the basis of auxiliary request 1 met the requirements of the EPC. The patent in suit concerns a refractory support structure article.

The patent proprietor withdrew their appeal, and thus their previous main request, during the oral proceedings before the board and is now only the respondent.

II. The following documents are of relevance:

D1 DE 44 05 269 C1 (family of US 5,785,519 A)
D5 US 4,487,579 A
D9 JP 2011 226690 A and a machine translation into English

III. In their statement of grounds of appeal, the appellant raised objections of insufficient disclosure, added subject-matter, lack of novelty and lack of inventive step. They submitted the following document:

D22 DE 20 2006 009 973 U1

IV. The respondent defended auxiliary request 1 found allowable by the opposition division and maintained auxiliary requests 2-24 submitted with the opposition division.

V. Claim 1 of auxiliary request 1 reads as follows:

*"A refractory article (1), comprising:
a support structure comprising:*

a first plurality of posts (2; 26, 28, 30, 32) coupled by a first member (22); and a second plurality of posts (4; 76, 78, 80, 82) substantially parallel with the first plurality of posts, the second plurality of posts coupled by a second member (24),

wherein the support structure has a height, H, and wherein the first and second members are positioned between 0.3H and 0.7H,

wherein each of first plurality of posts (2; 26, 28, 30, 32) comprises an aperture (36),

wherein the first member (22) is disposed within and extends through the apertures (36) of the first plurality of posts (2; 26, 28, 30, 32),

wherein each of second plurality of posts (4; 76, 78, 80, 82) comprises an aperture (36), wherein the second member (24) is disposed within and extends through the apertures (36) of the second plurality of posts (4; 76, 78, 80, 82)."

Claims 2-15 relate to particular embodiments.

VI. The appellant's arguments, where relevant to the present decision, can be summarised as follows.

The requirements of Article 123(2) EPC were not met because the features specifying the presence of apertures in which the members were disposed had been isolated from other features to which they were inextricably linked.

The claimed invention was insufficiently disclosed because it was not known how the coupling had to be done to obtain the required rigid and mechanically stable structure.

The subject-matter of claim 1 lacked novelty in view of D1.

D22 should be taken into consideration because it was a response to the impugned decision and furthermore reflected the common general knowledge.

The subject-matter of claim 1 lacked inventive step in view of each of D1, D5 and D9 as the closest prior art. D1 was the most relevant document and could additionally be combined with D5 or D9 as a secondary document.

VII. The respondent's arguments are reflected in the reasons for the decision.

VIII. The appellant (opponent) requests that the decision under appeal be set aside and amended such that the patent be revoked.

The patent proprietor's remaining request, as the respondent, is that the patent be maintained on the basis of one of auxiliary requests 1-24 submitted with the statement of grounds of appeal, which corresponded to auxiliary requests 1-10 filed in reply to the notice of opposition and auxiliary requests 11-24 filed on 21 July 2021 with the opposition division.

Reasons for the Decision

Auxiliary request 1

2. Article 123(2) EPC

2.1 Compared with the patent as granted, claim 1 additionally specifies that
"each of first plurality of posts (2; 26, 28, 30, 32) comprises an aperture (36), wherein the first member (22) is disposed within and extends through the apertures (36) of the first plurality of posts (2; 26, 28, 30, 32), wherein each of second plurality of posts (4; 76, 78, 80, 82) comprises an aperture (36), wherein the second member (24) is disposed within and extends through the apertures (36) of the second plurality of posts (4; 76, 78, 80, 82)".

2.2 According to the appellant, the application as originally filed (international application as published) disclosed the presence of apertures in which the members were disposed only for embodiments in which at least one of the first and second members could freely float within its respective aperture (page 12, first full paragraph) and had overhanging end sections (subsequent paragraph). This also derived from the figures. The appellant concluded that the features added to the claim (see point 2.1), specifying apertures in which the members were disposed, were inextricably linked to these other features relating to floating and overhanging end sections. In their opinion, this inextricable link also followed from the general purpose of the members to facilitate suitable mechanical characteristics (page 7, third paragraph

from the bottom), this requiring that the members freely float or be secured to the posts. Further according to the appellant, the disclosure that the first member could extend through each of the discrete posts (page 18, penultimate paragraph) did not support the amendment because it was silent as to the presence of an aperture.

2.3 These arguments are not convincing. The indicated amendment (see point 2.1) is based on page 11, first and second full paragraphs, also having regard to Figures 1-3 and the disclosure on page 18, penultimate paragraph and page 19, first full paragraph. According to this disclosure (page 11), each discrete post of the first plurality of posts can have an aperture extending through it. The first member is positioned within the first plurality of posts, i.e. disposed within the apertures (same for the second plurality of posts and the second member). This understanding is confirmed by the figures. It is furthermore disclosed that, "*[a]s seen in FIG. 2, the first member can extend through each of the discrete posts 26, 28, 30, 32 at a relative height thereof*" (page 18, last full paragraph; same for the second member on page 19). While this sentence does not expressly mention apertures, the first member clearly extends through the post via the aperture (which thus necessarily also extends through the post), i.e. the first member is disposed within and extends through the apertures, having regard to the application as a whole and in particular the reference to Figure 2.

2.4 The features relating to floating or overhanging end sections concern particular embodiments. It is explicitly stated in the indicated paragraphs (page 12, first and second full paragraphs) that *in particular embodiments*, at least one of the first and second

members can freely float within its respective aperture. Similarly, it is stated that *in particular embodiments* the first and second members can be positioned within an aperture with overhanging end sections. These features are thus optional in embodiments with apertures.

2.5 It is not convincing either that the need for structural stability would dictate that at least one of the first and second members floated within its respective aperture. Floating is merely described to *enhance* structural stability (page 12, first full paragraph). This does not imply that there would be no structural stability whatsoever and no coupling of the first (second) plurality of posts if the first or second member did not float in its aperture.

2.6 The requirements of Article 123(2) EPC are met.

3. Sufficiency of disclosure

3.1 The appellant argued in particular that the patent in suit did not teach the technical means of how the first (second) plurality of posts was coupled by a first (second) member. It was thus unknown what technical means would enable them to perform the coupling to achieve the required structural rigidity.

3.2 The claim does not refer to a rigid structure and does not specify any particular level of rigidity. Whether any desired effect not expressed in the claims under consideration is obtained is irrelevant for sufficiency of disclosure (see G 1/03 (OJ 2004, 413), Reasons 2.5.2; see also T 2001/12, Reasons 3.4).

3.3 The claim furthermore stipulates that the first (second) member is disposed within and extends through the apertures of the first (second) plurality of posts. It thus sets out how the coupling is achieved. This is also described in the patent in suit (Figures 1-4; paragraphs [0047], [0048], [0079]-[0082]). The skilled person would routinely provide apertures adapted to the dimensions of the posts and provide a corresponding coupling member that can be inserted through the apertures, also considering the teaching in the patent in suit on the relative dimensions (paragraphs [0050], [0053]). No evidence has been provided by the appellant that the skilled person would be unable to implement this structure. In opposition proceedings, the burden of proof is initially on the opponent (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, II.C.9).

3.4 The requirement of sufficiency of disclosure is met.

4. Novelty

4.1 According to the appellant, the subject-matter of claim 1 lacked novelty in view of D1. The appellant relied in particular on the figures. In their opinion, the rails (first and second members) were necessarily disposed within apertures because otherwise the required structural stability could not be achieved, and the structure described in D1 could not be used as a firing table which had to carry heavy loads, meaning that it could not fulfil its intended purpose.

4.2 However, D1 does not specify that the posts comprise apertures and that the rails are disposed within and extend through the apertures. This is not discernible

in the figures either. The fact that D1 does not limit how the rails are rigidly connected to the posts (col. 4, lines 51-54) does not imply apertures and does not amount to a direct and unambiguous disclosure of the rail being disposed within and extending through apertures. The appellant provided no proof in support of their assertion that providing the rails within apertures was the usual and the only functional way of connecting the rails to the posts.

4.3 The objection of lack of novelty is thus not convincing.

5. Consideration of D22

5.1 D22 was filed for the first time with the appellant's statement of grounds of appeal. It constitutes an amendment to the appellant's case (Articles 12(2) and 12(4) RPBA 2020).

5.2 The appellant was of the opinion that D22 should be taken into consideration because it was a reply to the opposition division's decision. According to the appellant, the opposition division had not sufficiently taken into account the skilled person's common general knowledge and routine practice concerning continuous beams in firing support structures in its decision.

5.3 D22 is a utility model and thus is unsuitable for demonstrating the common general knowledge. The common general knowledge is not normally established on the basis of patent documents (Case Law of the Boards of Appeal of the EPO, 10th edn., 2022, I.D.8.3, penultimate paragraph), and there is no reason to treat a utility model differently. The appellant relies on

D22 as a secondary document to be combined with D5 when questioning inventive step. However, auxiliary request 1 allowed by the opposition division had already been filed in reply to the notice of opposition. D22 thus cannot be seen as a response to the impugned decision. D22 should therefore have been filed with the opposition division.

5.4 D22 could thus not be admitted into the appeal proceedings (Article 12(6) RPBA 2020).

6. Inventive step

6.1 According to the appellant, an inventive step was lacking in view of D1 as the closest prior art. D5 and D9 were cited as alternative starting points.

6.2 The patent in suit relates to a refractory article and more particularly to a structurally rigid refractory article used to support and transport articles to be fired (paragraphs [0001] and [0118]).

6.3 Each of D1, D5 and D9 relates to the same general purpose (D1: col. 1, lines 3-6; D5: col. 1, lines 53-56; D9: paragraph [0001] of the English translation).

6.4 In line with the appellant's view, structural stability and rigidity are general requirements for support structures for firing. The general problem to provide a stable and rigid structure is already solved in the cited documents, and there is no basis for acknowledging that the claimed refractory article would have improved stability and rigidity. This also applies to the additional desired effect that a support

structure for firing should have low mass, i.e. an open structure.

- 6.5 The technical problem is therefore to be seen as providing an alternative.
- 6.6 The assessment of inventive step boils down to whether the skilled person, seeking to provide an alternative, would have modified the prior art and arrived at the claimed refractory article in which each of the first (second) plurality of posts comprises an aperture and the first (second) member is disposed within and extends through the apertures of the first (second) plurality of posts.
- 6.7 *Document D1*
 - 6.7.1 As follows from the reasoning on novelty (point 4.), D1 does not disclose that the posts comprise apertures and that the rails (members) are disposed within and extend through the apertures.
 - 6.7.2 The appellant argued that the rigidity and stability of a kiln furnace car dictated that the rails were disposed within apertures, this being a typical and very common configuration. It was similar to forming posts and rails as a single part as disclosed in D1 (col. 4, line 54), so there was even a pointer towards it in D1. Further according to the appellant, it was irrelevant that the rails known from D1 were profiled because the skilled person would have no difficulty in inserting them in apertures.
 - 6.7.3 These arguments are not convincing. D1 is silent as to providing the posts with apertures and placing the rails in the apertures. The appellant also provided no

evidence of their assertion (already raised for novelty) that the rigidity and stability of a kiln furnace car dictated that the rails were disposed within apertures and that this was the typical and most common configuration. It is not convincing either that the possibility of forming posts and rails as a single part (col. 4, line 54) would prompt the skilled person to provide the posts with apertures in which the rails could be disposed.

D1 more specifically addresses a problem in connection with the loading and unloading of items (col. 1, lines 12-20; paragraph bridging col. 1 and 2). For this purpose, D1 teaches as an essential feature that the rails (the first and second members) have a plurality of depressions that can function as roller bearings (col. 2, lines 38-44; claim 1). As can readily be pictured, and in line with the opposition division's finding (point II.5.9 of the impugned decision), this profiled design of the rails makes it less suitable to be disposed in and extend through apertures. The appellant provided no convincing argument or evidence to the contrary.

6.7.4 The skilled person starting from D1, taken alone, would not have arrived in an obvious manner at an embodiment within the scope of claim 1.

6.8 *Document D9*

6.8.1 The appellant relied in particular on Example 1 of D9 and Figures 1 and 2. D9 showed that the cross bars (members) were connected to the upright bars (posts) by placing them in the holes provided in the upright bars. In their opinion, it was irrelevant whether there was a

subsequent sintering step because the semi-finished structure before sintering was also relevant to claim 1. It would have been obvious for the skilled person to arrange the cross bars such that they extended through the posts because this would allow better distributing the weight and the forces and would thus provide better structural stability.

6.8.2 These arguments are not convincing either. According to D9, the assembled semi-finished products are sintered together to form a solid body. The appellant's view that the sintering step (sintering the semi-finished product) was optional cannot be accepted. The relevant structure to be compared with the claimed *refractory* article is the sintered product as the semi-finished (unsintered) product cannot be considered suitable for carrying heavy loads and will undergo changes (i.e. sinter) when fired. There is no evidence that it would be possible to identify in the sintered solid body a first (second) member disposed within apertures of the posts. Furthermore, D9 does not disclose that the cross bars extend through the apertures. The appellant did not identify any prior-art teaching which would suggest this, and there is no such teaching in D9. By contrast, fully extending cross bars would be incompatible with the modular structures shown in Figures 5 and 6, in which cross bars are present on opposite sides of an upright bar. There is no reason to assume that the skilled person would dispose the cross bars differently if no further set of upright bars was connected (Figures 1 and 4) because the same basic structure that can be customised is used in all cases.

6.8.3 The skilled person starting from D9 would thus not have arrived in an obvious manner at an embodiment within the scope of the claim.

6.9 *Document D5*

6.9.1 D5 (col. 1, line 59 to col. 2, line 9) discloses a structure in which horizontal tying members are used to interconnect hollow vertical support posts. Openings are formed through the walls of the posts to receive the tying members. The tying members are composed of discrete members which each extend between two vertical support posts (col. 4, lines 31-33). The tying members are interlocked within the hollow interior of the posts to stabilise and rigidify the structure. The tying members extend to approximately the centre of the hollow interior of the vertical support posts. The ends of two discrete members are adjacent to one another within the vertical support posts but are separated by a small gap, for instance, by inserting wedges between the ends (col. 3, lines 22-32; Figure 4). The members therefore do not *extend through* the posts.

6.9.2 The appellant was of the opinion that nothing inventive could be seen in replacing the discrete segments of a member with a continuous single-part member.

6.9.3 However, it is an essential feature of the structure known from D5 that interlocking means are disposed within the hollow vertical support for interlocking the horizontal tying means to it (claim 1). This configuration allows stabilising and rigidifying the structure (col. 1, lines 63-65). It is illustrated in the embodiment in Figure 4, in which each horizontal member 106 is interlocked by a locking pin 120 with a wedge 122 inserted between the horizontal members. A corresponding configuration involving an end lock 124 is provided in the corner posts (Figure 5).

D5 furthermore has the aim that a variety of the components can be interchanged with one another to provide versatility (col. 3, lines 14-21). The fact that the tying members 106 comprise discrete members which each extend between two vertical support posts 104 (col. 4, lines 31-33) additionally contributes to this aim.

It would therefore be incompatible with the teaching of D5 to replace the discrete segments of a horizontal member with a continuous single-part member that extends through the apertures of the plurality of posts.

6.9.4 The skilled person starting from D5 would thus not have arrived in an obvious manner at an embodiment within the scope of the claim.

6.10 *Further objections*

6.10.1 The appellant also argued that each of D5 and D9 was a suitable secondary document to be combined with D1. In their opinion, each of these combinations rendered obvious the subject-matter of claim 1.

6.10.2 Irrespective of whether these objections should be taken into consideration - they were only raised during the oral proceedings before the board - they are not convincing.

Neither D5 nor D9 shows an arrangement where a member, let alone a profiled rail, is disposed within and extends through an aperture, as is clear from the discussion of these documents above. Applying the teaching of D5 or D9 to D1 would therefore not result in a configuration in which the members extend *through*

the apertures. On the contrary, applying the teaching of D9 to D1 would result in a single solid body in which the members and posts are sintered together, in line with the explicit reference to a single-part design in D1 (col. 4, line 54). Applying the teaching of D5 would result in a structure in which each discrete member extends between two hollow vertical posts and is attached by interlocking means within the hollow post, similar to what is shown in Figure 4 of D5. The discrete members would be separated by a small gap within the vertical support posts.

- 6.11 In summary, the objections of lack of inventive step raised against claim 1 are not convincing.
- 6.12 Claims 2-15 directly or indirectly depend on claim 1. They therefore involve an inventive step for the same reasons.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



A. Voyé

E. Bendl

Decision electronically authenticated