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**Datasheet for the decision  
of 18 January 2024**

**Case Number:** T 0694/19 - 3.2.03

**Application Number:** 10856065.7

**Publication Number:** 2607828

**IPC:** F27B1/02, F27B15/00, C04B2/10,  
F27D13/00, F27D17/00

**Language of the proceedings:** EN

**Title of invention:**  
SYSTEM FOR CALCINING FINE LIME

**Patent Proprietor:**  
Baoshan Iron & Steel Co., Ltd.

**Opponent:**  
thyssenkrupp Industrial Solutions AG

**Relevant legal provisions:**  
EPC Art. 56

**Keyword:**  
Inventive step - main request (yes) - non-obvious alternative  
- could-would approach  
state of the art  
availability to the public  
public prior use (yes)  
public prior use - obligation to maintain secrecy (no)

**Decisions cited:**

T 2037/18



**Beschwerdekammern**

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Case Number: T 0694/19 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 18 January 2024**

**Appellant:** thyssenkrupp Industrial Solutions AG  
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**Representative:** Tetzner, Michael  
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**Respondent:** Baoshan Iron & Steel Co., Ltd.  
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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 11 January 2019  
rejecting the opposition filed against European  
patent No. 2607828 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** C. Herberhold  
**Members:** R. Baltanás y Jorge  
F. Bostedt

## **Summary of Facts and Submissions**

- I. European patent No. EP 2 607 828 B1 relates to "*a powder lime calcining system*".
- II. Opposition was filed against the patent based on Article 100(a) EPC in conjunction with Article 56 EPC.
- III. The present appeal is against the decision of the opposition division rejecting the opposition.

This decision was appealed by the opponent (appellant).

Oral proceedings were held on 18 January 2024.

- IV. Requests

The appellant requested that the decision under appeal be set aside and that the patent be revoked. The appellant further requested that auxiliary requests 8 to 17 not be admitted into the proceedings because they were late-filed.

The respondent (patent proprietor) requested that the appeal be dismissed and, as an auxiliary measure, that the patent be maintained on the basis of one of the sets of claims filed as auxiliary requests 1 to 7 with the reply to the statement setting out the grounds of appeal on 19 September 2019, or on the basis of auxiliary requests 8 to 17 filed with a letter dated 30 June 2020.

- V. Claim 1 as granted (main request), including the numbering of its features as adopted by the parties, reads as follows:

- F1** *A powder lime calcining system comprising:*
- F2** *a raw material storing bin (1),*
- F3** *a small material bin (3) connected to the raw material storing bin (1) by a belt conveyer (2),*
- F4** *a belt conveyer (4) disposed beneath the small material bin (3),*
- F5** *a breaking machine (7) beneath the belt conveyer (4),*
- F6** *a sieving device (6) communicated with the breaking machine (7) by a high temperature pipe (5),*
- F7** *a cyclone cylinder deduster (8) communicated with the sieving device (6) by an airflow pipe,*
- F8** *a clothbag deduster (9) connected to a rising pipe of the cyclone cylinder deduster (8) by a pipe,*
- F9** *an intermediate bin (10) connected to the clothbag deduster (9) by a transporting device,*
- F10** *another transporting device disposed at the material discharging port of the intermediate bin (10),*
- F11** *four preheating cyclone cylinders (12, 13, 14, 15) connected to the intermediate bin (10) by a pneumatic lift pump (11) and airflow pipes,*
- F12** *the four preheating cyclone cylinders disposed from top to down,*
- F13** *wherein the materials discharged from the third preheating cyclone cylinder (14) are decomposed by a high temperature calcining of a calcining system (16),*
- F14** *then transported into the fourth preheating cylinder (15) for separating airs and materials,*
- F15** *three cooling cyclone cylinders (17, 18, 19) disposed from top to down and beneath the fourth preheating cyclone cylinder,*

- F16** *a finished product transporting system (24) connected to the material discharging port of the third cooling cyclone cylinder (19) by a transporting device;*
- F17** *a finished product bin (25) connected to the finished product transporting system (24) by a pipe with a water cooling structure;*
- F18** *a cooling tower (21) connected to a rising pipe of the first preheating cyclone cylinder (12) by an airflow pipe,*
- F19** *and connected to the breaking machine (7) with its output by an airflow pipe and a course fan (22);*
- F20** *a main exhaust fan (23) connected to the clothbag deduster (9) by a pipe.*

VI. Prior art

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

- D1A: SAP printout of the order ("Anfrage-Nr.")  
23361270
- D1B: Technical drawing with the reference "BAOCAL  
2336 1270 - 31 067", 14 April 1990, KRUPP  
POLYSIUS
- D1B-1: Enlarged portion of the left part of D1B, where  
new reference signs have been added
- D1B-2: Enlarged portion of the central part of D1B,  
where new reference signs have been added
- D1E: Record of agreement ("Protokoll") between  
SHANGHAI BAOSHAN IRON AND STEEL WORKS, CHINA  
and KRUPP POLYSIUS AG, BECKUM/BR DEUTSCHLAND,  
16 September 1993

D7: Proceedings of the International Laterite Nickel Symposium 2004, pages 526-543, published by The Minerals, Metals & Materials Society

As the "closest" prior art, the appellant relied on the public prior use of a quicklime production plant bought by the respondent from the legal predecessor of the appellant (prior use BAOCAL). The appellant supported its allegations of public prior use with documents D1A, D1B and D1E, among others.

The appellant filed the following documents, which are relevant to this decision, for the first time with its statement setting out the grounds of appeal:

D1B-3: Enlarged portion of the left part of D1B, where new reference signs have been added

D8: DD 14378 A

The respondent filed the following document, which is relevant to this decision, for the first time with its reply to the statement setting out the grounds of appeal:

P1: Printout of the Wikipedia article about "Public sphere"

VII. The appellant's arguments concerning the main request which are relevant to this decision can be summarised as follows.

(a) Public disclosure of the prior use BAOCAL

The BAOCAL plant had been made available to the public by means of a sale. The respondent was the customer having bought and received the BAOCAL plant from the

legal predecessor of the appellant and was thus in a position to provide evidence on any non-disclosure agreement which might have prevented the public disclosure of the prior use BAOCAL. In the absence of this evidence, it had to be concluded that the prior use BAOCAL was rendered public by its sale to the respondent.

(b) Inventive step, obviousness of feature F17

The subject-matter of claim 1 differed from the public prior use BAOCAL only on account of features F7 ("a cyclone cylinder deduster communicated with the sieving device by an airflow pipe") and F17 ("a finished product bin connected to the finished product transporting system by a pipe with a water cooling structure").

The subject-matter of feature F17 was obvious when starting from the public prior use BAOCAL, which did not disclose this feature.

The technical effect of the distinguishing feature F17 was a reduction in temperature in the finished product bin. This prevented an excessive temperature of the end product, resulting in the objective technical problem of providing a suitable temperature for further processing of the end product.

It was clear to the skilled person that improved cooling was the essential point when looking for a solution to this problem.

The feature was obvious to the skilled person in consideration of their common general knowledge or in view of a combination with D7 or D8.



Concerning common general knowledge, the skilled person trying to solve the objective technical problem would have concluded that there was a need for a further cooling system. Only two options would be available to it, namely a cooling system based on an air stream combined with cyclone cylinders, as was already used in the public prior use BAOCAL, or a cooling system based on the use of water.

However, the cooling system of the prior use BAOCAL - based on the use of ambient air injected into a number of cooling cyclone cylinders - could not be further adapted for a number of reasons. Reducing the temperature of the incoming air or increasing its flow volume would lead to an unacceptable increase in the energy required. The same applied to the provision of further cooling cyclone cylinders. This would require vertical transport of the product upwards towards a further column of such elements since the transit from one cooling cyclone cylinder to the next one was based on gravity and the last cooling cyclone cylinder of the BAOCAL plant was already at the lowest possible level. This would require completely redesigning the production plant, including an increase in dimensions which would multiply the costs.

Thus only a water-based cooling system would be envisaged by the skilled person, who had to decide between the only two further options: cooling by direct or by indirect contact with water. Since direct contact of quicklime with water was out of the question given the nature of the material and its further use, the only remaining option for the skilled person was indirect cooling by water in the transport line towards the finished product bin. Therefore the skilled person

would arrive at feature F17 in an obvious way just by using their common general knowledge.

Alternatively, the skilled person would consult document D7 when addressing the objective technical problem since it related to a neighbouring field in which a powder product at high temperature was managed. Page 536 of D7 discussed the problem of providing a suitable temperature in a powder product for its further processing and Figure 10 disclosed the use of indirect water cooling as a solution to this.

The skilled person would also consult D8 since it discussed the cooling of powder products in general.

D8 was not to be excluded from the appeal proceedings under Article 12(4) RPBA 2007 since it was highly relevant and short enough not to have any detrimental impact on procedural economy.

D8 showed a cooling device based on indirect contact with water for general application to any product in powder form (see page 3, lines 41 to 43 and claim 1). This addressed the general problem of reducing the temperature of powder material irrespective of the particular example disclosed in D8. The discussion in lines 11 to 14 of page 3, which relates to cooling between a cement mill and the subsequent packing unit, concerned only the prior art and was not limiting for the solution taught in D8. Furthermore, the contested claim 1 did not define any amount of product to be cooled and D8 related to manufacturing cement, which was comparable to quicklime manufacturing in terms of production. Thus the skilled person would immediately have realised that D8 provided a solution to their

problem when starting from the prior use BAOCAL and would have adopted it.

The only remaining question for the skilled person motivated to integrate such a water-based indirect cooling system in the prior use BAOCAL was whether it should be installed before or after the finished product bin. This was a mere choice between two equally likely alternatives. Indeed, the skilled person would, rather, have been motivated to choose the location before the finished product bin since this addressed the excessive temperature of the end product in this bin. The contested patent did not disclose any advantage linked to the location of the cooling device before the finished product bin.

VIII. The respondent's arguments concerning the main request relevant to this decision can be summarised as follows.

(a) Public disclosure of the prior use BAOCAL

The BAOCAL plant had been located on a company site which was not accessible to the public. Such company site did not fall within the scope of the "public sphere" as defined in document P1. Employees of the firm could not be considered members of the public due to their contractual relationship with the respondent. Consequently, the prior use BAOCAL was not publicly available before the priority date and was not prior art within the meaning of Article 54(2) EPC.

(b) Inventive step, obviousness of feature F17

The subject-matter of claim 1 differed from the public prior use BAOCAL on account of features F7 ("a cyclone cylinder deduster communicated with the sieving device

by an airflow pipe"), F8 ("a clothbag deduster connected to a rising pipe of the cyclone cylinder deduster by a pipe") and F17 ("a finished product bin connected to the finished product transporting system by a pipe with a water cooling structure").

The distinguishing feature F17 comprised three elements: the presence of a cooling system, the location of the cooling system - before the finished product bin - and the kind of cooling system - a pipe with a water cooling structure.

The objective technical problem to be solved was how to achieve economical and efficient cooling for subsequent processing of the end product at the time it was needed.

The solution to this problem comprised a number of alternatives relating to each aspect of the distinguishing feature F17, namely:

- which means were used for cooling
- whether the cooling means were working on the product in a direct or indirect way
- the location of the cooling means before, after or in the finished product bin

Thus feature F17 was not the result of a "one-way street" development.

The skilled person could for instance arrange additional cooling cyclone cylinders such as those already used in the public prior use BAOCAL. The skilled person was not restricted in this by the actual design of the BAOCAL plant since the aim was to improve this design and adaptations were necessary for it in

any case - including if a water-based cooler were to be integrated.

D7 did not qualify as common general knowledge since it only concerned a particular solution for a specific situation, namely for the processing of nickel ore containing high amounts of dust. Any other applications did not generate such amounts of dust which rendered necessary pelletising and the associated cooling before this step (see page 540, reference to calcining lime, and page 541, second full paragraph from the bottom).

The skilled person thus would not have considered the cooling in D7 in view of the differences between quicklime production and processing of dusty nickel ore. Even if they had, they would only learn from D7 that cooling could be provided between a mixer and a pelletiser (see Figure 9), and not before a finished product bin.

Document D8 should be excluded from the appeal proceedings under Article 12(4) RPBA 2007 since it could and should have been filed during opposition proceedings. The then opponent had been aware of the weaknesses in the alleged disclosure of D7, having read the reply to the notice of opposition filed by the patent proprietor.

In any case, D8 only showed cooling of material before a packing device and not before a finished product bin. The skilled person reading lines 11 to 14 of page 3 would understand that this was the location intended for the cooling device disclosed in D8 and would have no motivation to envisage a different one.

## **Reasons for the Decision**

### 1. Public disclosure of the prior use BAOCAL

#### 1.1 The BAOCAL plant

It is undisputed that a quicklime production plant was built on the premises of the patent proprietor before the priority date. The correspondence of the reference numbers (23361270 - 31067) and the project denomination (BAOCAL) in D1A and D1B satisfies the requirement for proving with a high degree of probability that what was built at the patent proprietor's premises corresponds to the technical content of D1A and D1B.

#### 1.2 Public disclosure of the BAOCAL plant

The respondent argued that a company site did not fall within the scope of the "public sphere", and that employees of the firm could not be considered as members of the public due to their contractual relationship.

However, this is not crucial to the issue at stake.

According to well-established case law, a single sale is sufficient to render the article sold available to the public within the meaning of Article 54(2) EPC, provided that the buyer was not bound by an obligation to maintain secrecy, even if it is not proved that others also had knowledge of the relevant item (see Case Law of the Boards of Appeal, 10th edition, I.C. 3.3.1). If the contracting parties had wanted to exclude the sale and delivery from public

accessibility, they would have had to agree on a secrecy obligation.

In the present case, it was not shown that the parties to the contract were bound by any obligation to maintain secrecy. In particular, the respondent has not alleged, and there is no evidence on file, that the sales contract (referred to as CGB 87084 in D1E) comprised a non-disclosure agreement between the parties to the contract. In this context it is observed that the agreement terminating the above-mentioned contract (D1E) does not mention any obligation to keep the particulars of the BAOCAL plant secret in the future either - while several regulations and further obligations of the parties were agreed upon - after the contract had been explicitly terminated in 1993.

Consequently, the acts of selling and delivering the plant rendered it available to the public. The mere assertion of the respondent that a production hall within which the calcining system is usually located is not open to the public is not sufficient to cast doubt on the public availability of the system sold from one company to the other. The fact that the respondent later decided to file a patent application cannot have an impact on whether or not the system was made public by the sale.

Consequently, in view of the available evidence, it must be concluded that the BAOCAL plant was made publicly available before the priority date and thus forms part of the prior art according to Article 54(2) EPC.

It is further noted that, in general, each party bears the burden of proof for the facts it alleges. This

means that, while it is for the appellant to demonstrate what subject-matter was disclosed by the prior use and that it was made available to the public, it would have been for the respondent to demonstrate that the parties to the contract were under an obligation to maintain secrecy, for example that the parties to the contract had entered into a non-disclosure agreement (see T 2037/18, Reasons 8 and 9). Although the burden of proof may shift to the other party in special circumstances, e.g. if the information is available only to one party but not the other, the present case does not present such circumstances, in particular since both parties to the contract (or their legal successors) are also the parties to the appeal.

2. Inventive step, public prior use BAOCAL as "closest" prior art, Article 56 EPC

2.1 Undisputed features shown in the closest prior art

The parties agree that the BAOCAL plant consisted of a powder lime calcining system (feature F1) comprising features F2 to F6, F9 to F16 and F18 to F20, as indicated by the corresponding reference signs added in documents D1B1-1 to D1B-3, these documents being to a large extent identical to the drawings of the contested patent.

The parties further agree that features F7 ("a cyclone cylinder deduster communicated with the sieving device by an airflow pipe") and F17 ("a finished product bin connected to the finished product transporting system by a pipe with a water cooling structure") are missing in the BAOCAL plant.



## 2.2 Obviousness of distinguishing feature F17

### 2.2.1 Separate analysis

Uncontestedly the technical effect and objective technical problem associated with feature F17 are completely unrelated to those corresponding to features F7 (agreed as a distinguishing feature by the parties) and F8 (deduster of the clothbag type; contested as a distinguishing feature by the appellant).

Features F7 and F8 do not have any synergistic effect with feature F17 and the solution of F17 can be applied independently of F7 and/or F8 in order to solve a different corresponding problem. Thus a separate analysis of the obviousness of feature F17 is justified.

### 2.2.2 Technical effect and objective technical problem

The technical effect of feature F17 is that the end product has a reduced temperature on reaching the finished product bin.

The associated objective technical problem can be defined as ensuring a proper temperature for further processing of the end product, similarly to what was argued by the appellant. The aspects of economy and efficiency relating to the objective technical problem argued by the respondent are not persuasive since feature F17 only defines a technical aim - i.e. cooling the finished product - independently of any aspects related to efficiency or cost.

### 2.2.3 Combination with the common general knowledge

The respondent contests the common general knowledge relied on by the appellant, which formed the basis of its arguments, i.e. the absence of alternatives for the type of cooling system and its location in view of alleged technical and economic considerations.

Also the Board is not persuaded that the skilled person would be guided towards the invention in a kind of "one-way street" solution when addressing the objective technical problem.

The use of a water-based cooling system also implies costs, modifications and an increased energy consumption with respect to the BAOCAL plant, let alone the availability of a suitable supply of water. Thus the Board sees no reason to consider that the skilled person would *a priori* exclude other cooling systems - such as upscaling the one already used in the plant and based on cooling cyclone cylinders - on grounds of cost and complexity.

The same applies to the appellant's argument that there are only two alternatives for the location of a cooling system, since there is no technical obstacle to providing a cooling system in the finished product bin itself.

### 2.2.4 Combination with D7

D7 shows a particular solution relating to cooling for a specific case, namely the **pelletising of nickel ore** presenting dust problems. Document D7 addresses the **problem of disintegration of the nickel pellets** in the rotary kiln and provides a solution based on an

indirect cooler where - before pelletising - dust is cooled to the required temperature by water, although this **can also be operated with nitrogen to prevent reoxidation** (see first paragraph of page 536). D7 does not teach that dust problems justifying such a cooling solution arise when processing other products (see page 541, second paragraph from the bottom).

The field of application and the aim are thus so unrelated to the quicklime production plant BAOCAL that the skilled person would have not taken into consideration the indirect cooling disclosed therein for its application to the pipe connecting the finished product bin to the finished product transporting system as defined in feature F17. The teaching of D7 is limited to **cooling before pelletising when dust problems arise**. From this disclosure, the skilled person would not be motivated to arrange a cooling device before a finished product bin in order to store the whole production volume of any product whatsoever at a reduced temperature.

#### 2.2.5 Combination with D8

Since the arguments relating to the combination with D8 are not persuasive (see below), it is not necessary to enter into a discussion about whether this document should be excluded from the appeal proceedings in accordance with the discretionary power of the Board under Article 12(4) RPBA 2007.

D8 addresses a particular problem, namely the cooling of cement before a packing machine. Lines 11 to 14 of page 3 do not simply discuss prior art as argued by the appellant but set out the scenario of the application intended for the invention of D8. The aim of the

cooling device shown in D8 is therefore to use the latter before a packing machine.

Lines 67 to 72 of page 3 disclose that the cooling device is arranged **after** an intermediate bunker instead of before as defined in feature F17. The general understanding of the background disclosed in D8 makes it implicit that this cooling device is also arranged before a packing machine, as is discussed in the introduction of D8 concerning the difficulty of cooling cement at that precise location (see lines 11 to 40).

The appellant correctly points out that D8 also discloses that the cooling device shown therein can be used for other powder materials (see lines 41 to 43 of page 3). However, this does not imply disclosure of the use of this cooling device at a different location. The skilled person reading D8 will interpret this as an indication that the cooling device can be used before a packing device for any powder material.

The fact that claim 1 of D8 does not define a location for the cooling device does not also imply a disclosure of a location at a place which is not suggested by the rest of the disclosure and which would go against the intended use of the invention.

Actually, D8 teaches the skilled person that cooling is provided whenever this is needed for the further use of the end product, i.e. at the moment of packing it into sacks. Therefore the skilled person would at most be motivated by D8 to provide such a cooling device **after** the finished product bin or instead of the finished product bin of the BAOCAL plant in order to cool the precise amount of product which is needed on each occasion. Cooling the whole production of quicklime to

be stocked for an undefined period of time would go against the teaching of D8, and the Board sees no motivation for the skilled person to envisage this possibility in the light of the prior art.

3. Conclusion

The grounds for opposition invoked by the appellant do not prejudice maintenance of the granted patent (Article 101(2) EPC).

Consequently, there is no reason to set aside the contested decision.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed

The Registrar:

The Chairman:



C. Spira

C. Herberhold

Decision electronically authenticated