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Datasheet for the decision of 26 February 2015

Case Number: T 0484/13 - 3.2.08

Application Number: 05761263.2

Publication Number: 1784514

IPC: C22B1/16, C22B1/248, B30B11/18, B30B15/00, C21B13/00, B22F3/03

Language of the proceedings: EN

Title of invention:
APPARATUS FOR MANUFACTURING COMPACTED IRONS OF REDUCED MATERIALS COMPRISING FINE DIRECT REDUCED IRONS AND APPARATUS FOR MANUFACTURING MOLTEN IRONS USING THE SAME

Patent Proprietor:
Posco

Opponent:
MASCHINENFABRIK KÖPPERN GMBH & CO. KG

Headword:

Relevant legal provisions:
EPC Art. 100(b), 100(a), 56
RPBA Art. 12(4)

Keyword:
Sufficiency of disclosure - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 0484/13 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 26 February 2015

Appellant: (Patent Proprietor)	Posco 1 Goedong-dong, Nam-ku Pohang-shi, Kyungsangbuk-do 790-300 (KR)
Representative:	Hammond, Andrew David Valea AB Box 1098 405 23 Gothenburg (SE)
Respondent: (Opponent)	MASCHINENFABRIK KÖPPERN GMBH & CO. KG Königsteiner Strasse 2-12 D-45529 Hattingen (DE)
Representative:	von dem Borne, Andreas Andrejewski - Honke Patent- und Rechtsanwälte An der Reichsbank 8 45127 Essen (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 19 December 2012 revoking European patent No. 1784514 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	T. Kriner
Members:	M. Alvazzi Delfrate
	C. Schmidt
	C. Herberhold
	D. T. Keeling

Summary of Facts and Submissions

I. By its decision posted on 19 December 2012 the Opposition Division revoked European patent No. 1 784 514.

II. The appellant (patent proprietor) lodged an appeal against that decision in the prescribed form and within the prescribed time limit.

III. Oral proceedings before the Board of Appeal were held on 26 February 2015.

IV. The appellant requested that the decision under appeal be set aside and that the patent be maintained in accordance with the main request submitted at the oral proceedings.

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

V. Claim 1 of the main request reads as follows:

"An apparatus for manufacturing compacted irons (100) comprising:
a charging hopper (10) into which reduced materials containing fine reduced irons are charged;
screw feeders (12) installed inside the charging hopper (10) and making an acute angle (γ) with a vertical direction, the screw feeders (12) discharging the reduced materials containing fine reduced irons which enter into the charging hopper (10); and
a couple of rolls (20) separated from each other to form a gap (G) between the rolls (20), the couple of rolls (20) compacting the reduced materials containing

fine reduced irons discharged from the charging hopper (10) by the screw feeders (12) and manufacturing compacted irons,
wherein each screw feeder (12) is arranged side by side along an axis direction of the couple of rolls (20) and an extension of the center axis of each screw feeder (12) passes through the gap (G), the extension of the center axis of each screw feeder (12) mutually crossing at a vertical line which passes through the center of the gap (G), and
wherein the apparatus for manufacturing compacted irons (100) further comprises a feeding box (30) installed under the charging hopper (10), transferring reduced materials containing fine reduced irons to the couple of rolls (20) and forming a bulged space (38) under the charging hopper (10) which faces the feeding box (30)."

VI. The following documents played a role for the present decision:

B2: H.G. Bergendahl "Design of Roller Presses for the granulation of Potash by compaction";
B3: Brochure Köppern, "Anlagen zur Brikettierung und Kompaktierung";
B4: K. Zech, "Das Brikettieren auf Walzenpressen im Chemie-Betrieb", Chemie-Anlagen + Verfahren, 3/1971;
B5: H.G. Bergendahl, "Briquetting of Hot Sponge Iron"; published for "ILAFA" October 1992;
D1: WO -A- 2004/057042; and
D4: DE -A- 29 50 072.

VII. The arguments of the appellant can be summarised as follows:

Late-filed document B3

The Opposition Division had not admitted B3 into the proceedings by a correct exercise of its discretion. This document merely listed several applications of the roller presses without disclosing which press was to be used for sponge iron. Therefore, it was not *prima facie* relevant. Moreover, its late submission was not justified, because it was a document originating from the respondent itself. Therefore, it should not be admitted into the proceedings.

Sufficiency of disclosure

The finding of the Opposition Division that the invention was sufficiently disclosed was correct. In this respect reference was made to the submissions in the opposition proceedings.

Inventive step

Document D4 disclosed in Figures 1 and 2 a roller press with a charging hopper and screw feeders which were installed inside the charging hopper and made an acute angle with a vertical direction.

However, Figures 1 and 2 were schematic, so that they did not clearly show that each screw feeder is arranged side by side along an axis direction of the couple of rolls and that the extensions of the center axis of each screw feeder mutually cross at a vertical line which passes through a center of the gap.

Moreover, D4 did not disclose that the roller press was actually used for manufacturing compacted irons from reduced materials containing fine reduced irons. Indeed the roller press of D4 was not suitable for this use, which required high pressures, a cooling system to

operate at high temperatures and feed and containment means for an inert gas, in order to avoid the risk of an exothermic reaction of oxygen with the reduced fine iron.

Furthermore, D4 did not disclose a feeding box installed under the charging hopper, transferring the material to be compacted to the couple of rolls and forming a bulged space under the charging hopper which faces the feeding box. At least these features justified an inventive step. This arrangement served to achieve the object to reduce the elutriation of the material to be compacted and to improve the charging of the materials. The prior art did not suggest that this object could be achieved in accordance with claim 1. In particular, the provision of a bulged space was not disclosed or suggested by any prior art document.

Therefore, the subject-matter of claim 1 involved an inventive step.

Adaption of the description

The description was adapted to make clear that the features of the claimed apparatus according to claim 1 were compulsory. Since paragraph [0028] related to the use of the claimed apparatus and not to the apparatus itself, there was no need to amend this paragraph.

VIII. The arguments of the respondent can be summarised as follows:

Late-filed document B3

In respect of B3 the Opposition Division had exercised its discretion in the wrong way. This document

disclosed a press with the screw feeders arranged as in claim 1 and a possible range of applications, comprising the compaction of sponge iron. Hence, this document provided the link between the geometry of the screw feeders and the compaction of fine reduced iron. Therefore, it was even more relevant than B4, which had been admitted into the proceedings by the Opposition Division. Accordingly, B3 should also be admitted into the proceedings.

Sufficiency of disclosure

In respect of sufficiency of disclosure reference was made to the arguments presented in the opposition proceedings.

Inventive step

D4 disclosed in Figures 1 and 2 an apparatus with all the structural features stipulated by claim 1 save for the provision of a bulged space under the charging hopper. As to the feeding box, the provision of such a box was inherent in the device shown in D4 or at least obvious, since it was a standard measure to provide some protection to avoid the production of dust, as shown for instance in D1, B5 and B2. Furthermore, the device disclosed in D4 was to be considered as suitable for manufacturing compacted irons in the sense of the claim, which did not stipulate any additional structural feature for this purpose.

Starting from the device of D4, which was considered as the most relevant prior art, no inventive step could be acknowledged on the basis of the provision of a bulged space. This feature was so broadly defined that no technical effect was associated with it. Hence,

although the prior art documents did not show this bulged space, this feature did not justify an inventive step.

Accordingly, the subject-matter of claim 1 did not involve an inventive step.

Adaption of the description

According to paragraph [0028] the reduced materials containing fine reduced irons "may" enter into the feeding box and "may" be sealed inside it. The optional character of these features rendered the exact scope of the claim doubtful. Hence, the description was not correctly adapted to the claims.

Reasons for the Decision

1. The appeal is admissible.

2. Late-filed document B3

B3 was filed late and not admitted into the opposition proceedings because the Opposition Division considered it as not *prima facie* relevant (see page 11 of the decision under appeal, point 2.d)).

The Board notes that B3 is an advertising brochure that lists a number of possible applications for the presses produced by the respondent. Although the compaction of sponge iron is mentioned, this document does not disclose which of the different presses depicted in the photographs, if any, is used for this purpose. Therefore, B3 is indeed *prima facie* not highly relevant as it fails to provide a link between a particular

geometry of the screw feeders and the compaction of sponge iron.

Moreover, since this document originates from the respondent itself, there is no good reason for the delay in its submission.

Under these circumstances the Board saw no reason to overturn the discretionary decision of the Opposition Division and decided not to admit B3 into the appeal proceedings.

3. Sufficiency of disclosure

The respondent maintained its objection under Article 100(b) EPC but, given that no new arguments were submitted in the appeal proceedings, failed to indicate why the decision of the Opposition Division, which found that the claimed invention was sufficiently disclosed, should be incorrect.

Moreover, the Board notes that the patent in suit discloses embodiments of an apparatus falling within the scope of claim 1 (see the drawings). Accordingly, the Board upholds the view of the Opposition Division that Article 100(b) EPC does not justify the revocation of the patent.

4. Inventive step

4.1 Document D4 undisputedly discloses in Figures 1 and 2 a roller press comprising a charging hopper (60) into which the materials to be compacted are charged and screw feeders (40) installed inside the charging hopper. The screw feeders make an acute angle with a vertical direction and discharge the materials to be

compacted which enter into the charging hopper (10). The press comprises a couple of rolls (18, 20) separated from each other to form a gap between the rolls, which compact the materials discharged from the charging hopper by the screw feeders and manufacture compacted materials.

4.2 Although Figures 1 and 2 are of schematic nature, they clearly show that the screw feeders are arranged side by side along an axis direction of the couple of rolls and that the extension of the center axis of each screw feeder passes through the gap between the rolls. Accordingly, the extensions of the center axes of the screw feeders mutually cross at a vertical line which passes through the center of the gap.

D4 does not disclose that the roller press is actually used for manufacturing compacted irons from reduced materials containing fine reduced irons. However, the feature that the claimed apparatus is "for manufacturing compacted irons" does not stipulate that the claimed device is actually used for this purpose, but merely that it is suitable for it.

The appellant submitted that the compaction of fine reduced irons required a number of features which were not disclosed by D4, namely high pressures, a cooling system to operate at high temperatures and feed and containment means for an inert gas, to avoid the risk of an exothermic reaction of oxygen with the reduced fine iron. However, these elements are not recited in claim 1 either. By contrast, the elements of the apparatus of D4 which find a correspondent in claim 1, namely the charging hopper, the screw feeders and the rolls, are suitable to be used with fine reduced irons. With these elements the press of D4 is a complete

apparatus that can perform a compacting function. Hence, it is regarded as an apparatus "for manufacturing compacted irons".

4.3 However, D4 does not disclose a feeding box installed under the charging hopper, transferring the material to be compacted to the couple of rolls and forming a bulged space under the charging hopper which faces the feeding box. The respondent submitted that at least a feeding box was disclosed in D4. It is true that the definition of feeding box given in the claim is very broad. Nonetheless, this definition requires that an element which is configured as a box and serves the purpose of transferring the material to be compacted is installed under the charging hopper. The schematic drawings of D4 do not show such an element. Hence, D4 does not disclose that the apparatus has a feeding box installed under the charging hopper and transferring the material to be compacted to the couple of rolls, let alone one forming a bulged space under the charging hopper which faces the feeding box.

4.4 The object achieved by the claimed invention by means of these distinguishing features is to reduce the elutriation of the material to be compacted and improve the charging of the materials.

By containing the region under the charging hopper the feeding box reduces elutriation. Moreover, also by virtue of the bulged space, it can secure a stagnating layer of the material to be compacted, which would otherwise be provided in a non-uniform way by the screw feeders, thereby suitably supplying the material to the rolls (see paragraph [0099] of the patent in suit).

The respondent submitted that the latter effect was not provided by the claimed device because the claim did not define to which degree the space under the charging hopper was bulged. However, this argument is not convincing because the broad definition may affect the extent of the effect provided by the bulged space but not the fact that a bulged space provides an effect which is not provided by a non-bulged one.

4.5 The provision, in order to reduce dusting, of a structure installed under the charging hopper, which transfers the material to be compacted to the couple of rolls and which may thus be regarded as a feeding box, is common in the art (see for instance D1, Figure 2 and page 12, lines 20 to 22). However, as acknowledged by the respondent itself, the prior art documents on file, in particular D1, B2 and B5, do not disclose a bulged space as stipulated by the claim. Nor do they render it obvious to address the problem of a uniform distribution of the powder by this measure. Therefore, the subject-matter of claim 1 involves an inventive step.

5. Adaption of the description

It is true that according to paragraph [0028] the reduced materials containing fine reduced irons "may" enter into the feeding box and "may" be sealed inside it. However, this paragraph relates to the use of the compacting apparatus, whereas the claims are directed to the apparatus itself. Indeed, as far as the apparatus features are concerned, the description has been adapted to make clear that the features stipulated by claim 1 are not optional (see paragraphs [0012], [0016] and [0019]). Therefore, the description is correctly adapted to the claims.

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 the following documents:

   - claims 1-63 of the main request, filed during the oral proceedings,
   - description: columns 3, 4, 21 and 22 as filed during the oral proceedings and columns 1, 2 and 5 to 20 as granted,
   - drawings: Figures 1 to 16 as granted.

The Registrar: The Chairman:

V. Commare T. Kriner

Decision electronically authenticated