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D E C I S I O N
of 27 February 1996

Case Number: T 0412/91 - 3.2.2

Application Number: 84306523.1

Publication Number: 0136169

IPC: C22C 33/02

Language of the proceedings: EN

Title of invention:

An alloy steel powder for high strength sintered parts

Patentee:

KAWASAKI STEEL CORPORATION

Opponent:

Höganäs

Headword:

Alloy steel powder/KAWASAKI

Relevant legal provisions:

EPC Art. 54

Keyword:

"Interpretation of citation contrary to text"

Decisions cited:

T 0077/87; T 0450/89; T 0513/89; T 0591/90

Cathchword:

T 77/87, OJ EPO 1990, 280, defined the state of the art for the purposes of Article 54 EPC as including what had been made available to the skilled person as a matter of technical reality, and on that basis excluded from the state of the art a feature of a cited abstract shown to be wrong by reference to the patent on which it was based, and to which the abstract referred. Later decisions reflect that fact that published matter may also be excluded from the state of the art if it is so implausible in the eyes of the skilled reader that he would reject it as erroneous, or where, as in the present case, the same conclusion is based on the combined effect of internal contradiction and a readily accessible relevant external disclosure.

Case Number: T 0412/91 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 27 February 1996

Appellant: Höganäs AB
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Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 25 March 1991 rejecting the opposition filed against European patent No. 0 136 169 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: H. Seidenschwarz
Members: R. Lunzer
M. Auz Castro

Summary of Facts and Submissions

I. European patent No. 136 169 was granted on 8 March 1989 on the basis of application No. 84 306 525.1 filed on 25 September 1984, claiming a priority date of 29 September 1983 based on Japanese Application No. 179211/83. Claim 1 of the patent as granted took the following form:

"An alloy steel powder for high strength sintered parts consisting of 0.4-1.3% by weight of Ni, 0.2-0.5% by weight of Cu provided that the total amount of Ni and Cu is 0.6-1.5% by weight, 0.1-0.3% by weight of Mo, not more than 0.02% by weight of C, not more than 0.1% by weight of Si, not more than 0.3% by weight of Mn and not more than 0.01% by weight of N, the remainder being Fe and incidental impurities."

II. An opposition was filed by the Appellant on the ground of Article 100(a), alleging lack of novelty (Article 54 EPC), and lack of any inventive step (Article 56 EPC). The Opponent relied in particular on the following documents:

- (1) GB-A-1 469 655 and
- (1a) US-A-3 864 809, the US equivalent of document (1).

III. By its decision issued in writing on 25 March 1991 the Opposition Division rejected the opposition. It held that although there was some overlap between the compositions, the subject of Claim 1 of the patent in suit and those disclosed in document (1), because document (1) disclosed a range of Cu contents from 0.15 to 2.25%, while Claim 1 covered the range of 0.2 to

0.5%, nevertheless as the whole teaching of document (1) was directed to using much higher proportions of Cu, there was novelty on the basis of selection. Concerning inventiveness it held that as the compositions exemplified in document (1) were far removed from those claimed in the patent in suit, and as the composition of the powder used for the comparative test included in the patent in suit in Table 1 identified as a "Conventional steel powder", although closer to the claimed compositions than those disclosed in document (1) still did not achieve the desired properties of the compositions according to the alleged invention, document (1) was not a sufficient lead for the skilled worker in the direction of the claimed subject-matter, which was therefore inventive. The remaining documents were remoter than document (1) and therefore did not need to be considered for the assessment of novelty or inventiveness.

IV. An appeal against that decision was filed on 27 May 1991, the appeal fee was paid on the same day, and the Statement of Grounds of Appeal was filed on 22 July 1991. In that statement, the Appellant argued that novelty was lacking having regard to the ranges of compositions disclosed in document (1). Regarding the stated objectives of the alleged invention, viz. to obtain an alloy powder offering low cost in relation to prior art alloys, good compressibility, high strength of the sintered body, and the absence of a need for a specific atmosphere during sintering, it was argued that the skilled worker would have known from the outset that cost could be reduced, and compressibility improved, by reducing the proportions of Cu and Ni from the levels hitherto used, since these alloying elements

were known to be relatively costly, and it was also known that all alloying elements added to a steel powder which were present in solid solution increased the hardness of the powder. Likewise the skilled worker would know that a composition containing less alloying elements was less susceptible to the furnace atmosphere during sintering, while the claim to have achieved improved strength in the sintered compacts was unsubstantiated.

In response to a communication from the Board dated 29 August 1995 accompanying a summons to oral proceedings the Appellant made reference to a paper:

(10) The effect of Copper and Nickel additions to high compressibility Sponge Iron Powder on the sintered properties of materials with 0.3 and 0.6% Carbon, by L. E. Svensson, Powder Metallurgy, 1974, volume 17, No. 34 pages 271 to 287,

and argued that the alleged invention was obvious in the light of its disclosure, or in the light of its disclosure together with that of document (1). It also indicated that it would not appear at the proposed oral proceedings, the date for which was consequently vacated by the Board.

- V. The Respondent argued in its counterstatement that none of the prior art remotely suggested that the considerable advantages of the invention, with respect to savings in the costs of alloying elements and avoiding the need for protective atmospheres during sintering, could have been attained at the same time as achieving a product with superior mechanical

properties. It had also contended in its reply to the opposition filed on 4 July 1990 that a study of document (1) indicated a strong probability that the Cu range given in Claim 1 was incorrect, and that a skilled reader would have understood that the lower limit should have read "0.75%", rather than the figure of "0.15%" which appeared in the printed document.

VI. The Appellant requested that the decision under appeal be set aside, and the patent revoked. The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *The Alleged Invention*

2.1 The alleged invention relates to iron alloys containing small proportions of Cu, Ni and Mo used in powder metallurgy. Such powders are formed into finished components by compressing the powder, and thereafter sintering, usually in the presence of a protective atmosphere. The stated objectives of the alleged invention, as set out at page 2 lines 13 to 16 and page 3 lines 29 to 34 of the patent in suit, are to achieve a cheaper product by using less of the relatively costly alloying constituents Cu and Ni, while at the same time improving compressibility, with consequently improved toughness and strength, and avoiding the need to employ a relatively costly protective atmosphere. In accordance with the patent in suit, those goals are achieved by the use of a

composition as defined in Claim 1. Such compositions differ from those commonly in use in that the maximum level for combined Cu + Ni of 1.5% is below the combined amount normally contemplated.

2.2 That the desired results are attainable in accordance with the alleged invention is supported by the data contained in Table 4, used as a basis for Figures 1, 2, and 3 of the patent in suit. These Figures show tensile strength, plotted respectively against combined Ni + Cu contents, Cu content, and Mo content, and confirm that peak strength is achieved within the claimed composition limits, albeit that not much worse results are shown by compositions just outside the claimed composition limits.

2.3 On the basis of the data given in the patent in suit, the Board is satisfied that a useful range of compositions is defined by Claim 1 in suit. It does not matter, and is hardly surprising, that some compositions lying close to the claimed range may give comparable results.

3. *Disclosure of document (1)*

3.1 Document (1) defines in Claim 1 and the corresponding introductory passage at page 2 lines 3 to 13 a composition of an alloy intended for use in powder metallurgy having the following essential constituents, the balance being iron and impurities:

Ni	0.25 - 1.5
Cu	0.15 - 2.25
Mo	0.1 - 0.6

(emphasis added).

3.2 The skilled reader could not fail to notice that the ranges of the components are broadly defined, with Ni and Mo having a range of 6:1 between their maxima and minima, and that the Cu range is still broader, having a 15:1 ratio between its maximum and minimum limits. He would also observe that the minimum proposed proportions of Ni and Cu are very small in relation to the known compositions, which normally contain a combined amount of some 2.0% (patent in suit page 2 line 18). So alerted, he would look with interest to see what results are attainable with alloys at the lower end of the ranges specified for Cu and Ni near to the combined lower limit of 0.4%. Reading the description further he would reach at page 2 lines 82 to 90 the passage which teaches:

"Copper has a small though undesirable influence on the A_{c1} temperature. Its main effect is that of imparting strength through precipitation hardening, although it does not appreciably contribute to solid solution strengthening during forging. Preferably therefore, the copper content should be at least 0.75% and more preferably at least 1.5%."

3.3 The skilled reader would note that the proportion of Cu said to be more preferred is at least ten times as high as the claimed minimum, and he would be wondering why, if 0.75 to over 1.5% Cu is needed, the very significantly lower limit of 0.15% was included in the Claims. The statement quoted above is not of the kind commonly encountered in patent specifications, where a desired effect is to be seen in a given range, and

still more strongly within a narrower range, reflected by a dome shaped graph as exemplified in Figure 1, 2 and 3 of the patent in suit. Instead, the quoted passage teaches that the effective range for copper **starts** at 0.75%, with no hint that as little as 0.15% could be of any value at all. Notwithstanding the use of the word "preferably", the above-quoted statement is more a contradiction than an amplification of the broad range of Claim 1, to the extent that doubts would arise in the skilled reader's mind as to whether the lower limit of 0.15% had been intended, or whether that low figure was a mere misprint for the 0.75% minimum amount mentioned in the reasoned statement quoted above. He may be presumed to be aware that the numbers 1 and 7, particularly when in manuscript form, are capable of being confused.

- 3.4 The doubts already mentioned would be further fuelled by the passage at page 3 lines 42 to 46, in which, when discussing the preferred ranges of Cu and Ni, the skilled reader would note that the amounts of Cu proposed are consistently larger than the proportions of Ni. That is confirmed in the two Examples in accordance with the invention of document (1) (Alloys 1 and B of Table 1) each of which contains 1.9% Cu, i.e. some 13 times as much as the claimed lower limit, with a further 0.95% of Ni. These Examples have a combined level of Cu + Ni of 2.85%, and shed no light on what might be the possible effect of going to the lower extremity of the claimed ranges, with a total Cu + Ni amounting to only 0.4%. At the very least, based on the text of document (1) alone, there would be strong doubt in the mind of the skilled reader as to whether the lower limit of 0.15% of Cu was intended at all.

3.5 That uncertainty as to the intended lower limit for Cu would have the effect that a worker, seeking to establish the true intentions of document (1), would search for, and readily to find the US equivalent, which is document (1a) above. It can readily be found because document (1) identifies the patentee, the number of the Convention Application, and the date of filing in the USA. Document (1a) sets the lower limit for Cu at 0.75%, and includes in column 2 line 65 to column 3 line 4 a passage corresponding to that quoted above. The skilled reader would thus reach the firm conclusion that the figure of 0.15% is attributable to an error, and that the higher minimum level for Cu of 0.75% must have been intended.

4. *Legal Position*

4.1 In a few prior decisions the Boards of Appeal have faced the question of whether a feature revealed by a prior published document could be disregarded because the skilled reader would perceive that the published text was erroneous, and therefore could not be taken at face value.

4.2 As observed in the reported decision T 77/87, OJ EPO 1990, 280 (Reasons point 4.1.2) "When determining the state of the art for the purposes of Article 54 EPC, what has to be considered is what has been made available to the skilled person. A skilled person is interested in technical reality." In that case, although a feature of the invention of the patent in suit was disclosed in a chemical abstract, the published patent referred to in the abstract showed that the abstract was wrong. In those circumstances it

was held that the feature disclosed in the abstract did not form part of the state of the art (Reasons point 4.1.4) because the patent specification had to be regarded as providing the definitive description of the monomer composition in question. In the factual circumstances of that case, an error in a cited document was capable of being corrected to establish the true state of the art by reference to a second document, the patent mentioned by number in the cited abstract.

4.3 In the decision T 450/89 of 15 October 1991 (not reported in OJ EPO) there was no possibility of clearing up an uncertainty by reference to a second document. What had to be decided was whether a long cited patent specification, concerned almost entirely with the deposition of two layers onto an aluminium substrate, the first of those layers being Ni and the second Sn, also included a disclosure of the successive application of two layers of Ni. Such a disclosure would have deprived the patent in suit of novelty. The Board held that although there was a single, obscure, isolated reference to an outer coating of Ni, it was so obscure and self-contradictory that it could not deprive the patent against which it was cited of novelty (Reasons point 3.11).

4.4 A further example of a decision in which the literal wording of a disclosure was disregarded, and not treated as prior art for the purposes of Article 54 EPC, is afforded by the decision T 513/89 of 22 October 1991 (not reported in OJ EPO). There was neither an external source of information used to correct an existing text, nor was there any literal obscurity in

the cited text. Nevertheless the Board was satisfied that the disclosure, although clear as a matter of language, would have been disregarded by the skilled reader, who would have considered it to be due to a textual or typing error. It concerned an invention which involved impregnating Cr powder compacts with liquid Cu, the novel feature being that the powder was poured into a form, and was impregnated, without the conventional step of compressing prior to impregnation. A prior patent specification was cited in which such impregnation was performed on a body of powder which had undergone one or other of two steps. Either it had been poured into a former and pressed, or it had been sintered, before the impregnation stage was reached. However, there was a single instance in which reference was made to impregnating a body of sintered powder as being carried out on powder which had been "poured **or** pressed", instead of "poured and pressed", as elsewhere in the text. Taken literally, this amounted to a disclosure of impregnating poured powder, which had not been subjected to prior compression. That would have deprived the patent in suit of novelty. However, the Board observed that the typist had typed the words "pressed **or** sintered" seven times, and may have slipped in writing on a single occasion "poured or pressed", where, as would have been clear to the skilled reader, the only alternative to a sintered body mentioned in the specification was one which had been both "poured **and** pressed" (Reasons point 5.5). Accordingly, despite the actual wording found in the prior document, it was held that there was no disclosure of impregnating a body of powder which had been poured, but not pressed (Reasons point 6).

4.5 Finally, in the decision T 591/90 of 12 September 1991 (not reported in OJ EPO) it was said that, according to Article 54(2) EPC a prepublished document belonged to the state of the art even if it contained errors, but that the person skilled in the art would interpret the document in the light of his general technical knowledge and, with reference to the decision T 77/87, of technical reality, and would correct any technical errors that he would recognise. The facts were that a cited document stated that the most commonly used material for the production of a certain class of container was aluminium sheet with an extruded coating of polypropylene, which statement was said to be supported by an identified literature reference. The skilled reader would have been surprised by that statement. Not only was such a starting material not in common use, but it was completely unknown in the industry, and the reference lent no support to the statement. Consequently the Board held that due to the recognisably wrong prior teaching, that document did not afford a pointer towards the invention.

4.6 These decisions reflect a consistent practice of the Boards, to which the Board adheres. In principle, what constitutes the disclosure of a prior art document is governed not merely by the words actually used in its disclosure, but also by what the publication reveals to the skilled reader as a matter of technical reality. If a statement is plainly wrong, whether because of its inherent improbability or because other material shows that it is wrong, then although published it does not form part of the state of the art. Conversely, if he would not recognise that the teaching is wrong, it does belong to the state of the art.

4.7 In the present case, the issue is again, what did document (1) disclose to the skilled person as a matter of technical reality. Taking into account the fact that, for the reasons given in point 3 above, he would have regarded the lower limit for Cu content as 0.75%, the Board holds that for the purposes of Article 54 EPC, what forms the state of the art is the lower limit for Cu of 0.75%, and not the lower limit of 0.15% actually printed in Claim 1 of document (1). This conclusion is based on the combined effect of internal contradiction (points 3.1 to 3.4) and the ready availability of an external disclosure (point 3.5).

5. *Novelty and Inventiveness*

5.1 Insofar as the Appellant has based its attack on document (1), it is on the basis that there had been a prior disclosure of a composition having a range of Cu content of 0.15 to 2.25%. The Board having rejected that interpretation of document (1), and holding that the lower limit disclosed to the skilled reader is 0.75%, it follows that the Appellant's arguments challenging novelty and inventiveness, both of which were based on the premise that document (1) disclosed a range of Cu contents going as low as 0.15% must be rejected. As the Board regards the effective disclosure of document (1) as setting a minimum Cu content of 0.75%, it follows that this document cannot be a pointer for the skilled reader in the direction of the significantly lower Cu contents which are a feature of Claim 1 of the patent in suit. The subject-matter of Claim 1 is therefore novel and inventive over the disclosure of document (1).

- 5.2 In its final letter of 8 December 1995 the Appellant referred to document (10). It is concerned with a study of the effects of including up to 5% each of Ni and Cu, and particularly with the fact that growth during sintering caused by additions of Cu is capable of being compensated by comparable additions of Ni, which causes shrinkage. As the presence of Mo is not disclosed, this document is relied on in combination with document (1) in which Mo is disclosed as the basis for an attack on inventiveness, but not in attacking novelty.
- 5.3 Figures 3, 4, 5, 6 and 7 of document (10) each includes lines reflecting various mechanical properties, with Cu in the range of 0 to 5% shown as ordinate, and Ni in the range of 0 to 5% as abscissa, while in Figure 8, mechanical properties are the ordinate, 0 to 5% Ni is the abscissa, and bands are shown horizontally for various ranges of Cu contents. From this experimental work, which is directed to the range of 0 to 5% each of the two elements, it is far from clear what alloys, if any, were made with Cu and Ni contents within the ranges defined by the patent in suit. But in any event it is not a pointer in the direction of the claimed compositions, since it recommends Ni additions in excess of 4%, and does not suggest any potential usefulness of powders containing the small proportions of Cu and Ni the subject-matter of Claim 1 in suit.
- 5.4 Accordingly the Board is satisfied that neither documents (1) nor (10), nor these documents taken in combination, makes the invention obvious. Insofar as other documents had been cited by the Appellant, they were concerned with factual background information in support of the attack based on document (1) with its

erroneously low minimum Cu content, and therefore do not call for consideration individually.

6. *Conclusion*

The subject-matter of Claim 1 meets the requirements of Articles 54 and 56 EPC and is therefore patentable. Claim 1 being allowable, the same applies to dependent Claim 2, which is directed to a preferred composition according to Claim 1 and whose inventiveness is supported by that of the main claim.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

S. Fabiani

H. Seidenschwarz