

Publication in the Official Journal ~~Yes~~ / No

File Number: T 55/89 - 3.2.4

Application No.: 81 201 405.8

Publication No.: 0 083 380

Title of invention: Diamond saw

Classification: B24D 5/12; B28D 1/12

D E C I S I O N  
of 30 April 1991

Applicant: Sankyo Diamond Industrial Co., Ltd

Headword:

EPC Articles 56, 113(2), 123(2); Rule 86(3)

Keyword: "Examining Division based its decision on claims which were already  
withdrawn by the applicant";  
"Decision to refuse claims under Rule 86(3) not reasoned";  
"Main and second auxiliary request: no inventive step";  
"First auxiliary request: subject-matter extending beyond the  
content of the application as filed".

Headnote



Case Number : T 55/89

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.4  
of 30 April 1991

**Appellant :** Sankyo Diamond Industrial Co., Ltd  
1770 Hongo, Ebina-shi  
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**Representative :** Madeuf, Claude Alexandre Jean  
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**Decision under appeal :** Decision of Examining Division 2.3.02.097 of the  
European Patent Office dispatched on 24 June 1988  
refusing European patent application  
No. 81 201 405.8 pursuant to Article 97(1) EPC.

**Composition of the Board :**

**Chairman :** C. Andries  
**Members :** H. Seidenschwarz  
J.-C. Saisset

## Summary of Facts and Submissions

- I. European patent application No. 81 201 405.8 filed on 30 December 1981 and published on 13 July 1983 was refused by a decision of the Examining Division 2.3.02.097 dispatched on 24 June 1988.
- II. The decision was based on Claims 1 to 10 filed with the letter of 6 March 1987.

The reasons given for the refusal were

- that Claim 1 contained features which were not supported by the application as filed and, therefore, the application had been amended in such a way that it contained subject-matter which extended beyond the content of the application as filed (Article 123(2) EPC);
- that, independently of the foregoing objection, the subject-matter of Claim 1 lacked an inventive step (Article 56 EPC) in the light of the teachings known from the documents

D1: US-A-2 811 960, and

D2: FR-A-1 128 866.

Furthermore, the Examining Division stated in its decision that Claim 1 filed with the letter of 28 January 1988 after the Division's last communication, dated 9 October 1987, did not overcome the objections with respect to added subject-matter and lack of inventive step of Claim 1 filed with the letter of 6 March 1987 and that the Examining Division was therefore entitled not to consent to the making of further amendments pursuant to Rule 86(3) EPC.

III. On 20 August 1988, the Appellant lodged an appeal against said decision, paying the appeal fee simultaneously.

The statement of grounds of appeal with new independent Claims 1, 2 and 3 was received on 24 October 1988.

IV. In a communication dated 7 November 1990, the Board expressed the provisional opinion that independent Claim 2 contravened Article 123(2) EPC and that the subject-matter of independent Claims 1 and 3 did not involve an inventive step having regard to the teachings according to the documents D1 and D2.

V. The Appellant's submissions in his statement of grounds and in his letter of 8 January 1991 in response to the Board's communication can be summarised as follows:

- Claims 1 to 10 filed with the letter of 6 March 1987 and deemed by the Examining Division in the impugned decision not to be allowable, were already deleted by submitting a new set of three independent claims with the letter of 28 January 1988;
- the new claims filed on 24 October 1988 and corresponding to those filed with the letter of 28 January 1988 were drafted in view to meet some apparent suggestions of the examiner in the communication of 9 October 1987 and, therefore, the new Claim 2 did not contradict Article 123(2) EPC;
- the feature concerning the alignment of corrugations or corrugated portions could be called obvious only by retrospect after having read the applicant's disclosure.

VI. According to his notice of appeal and his letter of 8 January 1991, the Appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the following documents:

Independent claims filed with letter of 28 January 1988:

- Claim 1 as main request,
- Claim 2 as 1st auxiliary request,
- Claim 3 as 2nd auxiliary request;

Description:

pages 1, 2, 7 and 8 as originally filed,  
pages 3 to 6 filed with letter of 6 March 1987;

Figures 1, 2, 2a and 3 to 8 filed with letter of 6 March 1987;

9 and 10 as originally filed.

VII. The independent claims of the requests read as follows:

(i) Main request:

"A diamond saw for cutting hard materials such as stone, rock, concrete products or the like materials, comprising a rotary support disc (1) made of steel and an annular sintered abrading body (2) fixed to the outer periphery of said support disc, with said sintered abrading body consisting of a mixture of diamond abrading particles and a bonding metal powder and being provided with a plurality of grooves (3) indented on each side of said abrading body and which are arranged radially keeping zigzag phase position at both front and back sides alternately, characterized in that said support disc is provided with a plurality of corrugations (5) which are in succession of peaks and troughs being formed radially on each side of said support disc, each of said corrugations of said support disc and each of said grooves of said sintered

abrading body are aligned with each other on each face of the support disc, and in that said sintered abrading body is continuous."

(ii) 1st auxiliary request:

As the independent claim according to the 1st auxiliary request differs only from the above independent claim by the characterising portion, only this part is cited:

"characterized in that said support disc has one face provided with a plurality of corrugations (5) formed radially on said support disc, and in that a part of said corrugations and each of said groove of said sintered abrading body are in alignment."

(iii) 2nd auxiliary request:

"A diamond saw for cutting hard materials such as stone, rock, concrete products or the like materials, comprising a circular steel plate (1) and an annular sintered abrading body (2) fixed to the outer periphery of said circular steel plate, with said sintered abrading body consisting of a mixture of diamond abrading particles and a bonding metal powder and being provided with a plurality of grooves (3) indented on each side of said abrading body and which are arranged radially keeping zig-zag phase position at both front and back sides alternately, characterized in that said corrugated portions (5) are radially arranged in said circular steel plate, and in that a part of said corrugated portion and each of said grooves are in alignment."

This independent claim differs from the preceding claims by the replacement of the expression "a rotary support disc (1) made of steel" by the expression "a circular

steel plate" in the pre-characterising portion, and by the characterising portion.

#### Reasons for the Decision

1. The appeal is admissible.
2. Procedural issues

The Board wants to give in this particular case the following comments on the impugned decision:

- 2.1 This decision, although stating that the Examining Division refuses its consent to Claim 1 filed with letter of 28 January 1988, is based on Claims 1 to 10 filed with letter of 6 March 1987.

The Appellant, however, clearly indicated in his letter of 28 January 1988 when filing the independent Claims 1 to 3, that he deleted all claims on file (Technical note, page 1, second paragraph), i.e. Claims 1 to 10 filed with letter of 6 March 1987. The Examining Division therefore did not decide upon the present European patent application in the text submitted to it or agreed by the applicant (Article 113(2) EPC).

- 2.2 As already indicated above, the Appellant filed at the end of the examining procedure with his letter of 28 January 1988 three independent claims numbered 1 to 3.

Although, due to the numbering of these newly filed independent claims, namely 1 to 3, it is not directly clear that with these claims three different requests are made, this however becomes clear in the Board's opinion

when reading the "Technical note" annexed to said letter of 28 January 1988.

The Examining Division did not comment on the independent Claims 2 and 3 and, therefore, did not give any reasons in the impugned decision to explain the use of its discretion when refusing its consent to the filing of these Claims 2 and 3.

- 2.3 In view of the above points 2.1 and 2.2, the Board is of the opinion that substantial procedural violations have occurred in the present case.

However, the Board considered that it was appropriate to decide the case on the issue of patentability rather than remitting the case to the Examining Division (Article 111(1) EPC).

### 3. Amendments

#### 3.1 Claims 1 and 3

The features in these claims can be unequivocally deduced from the Claims 1, 2, 3, 8 and 9 and the description (page 3, line 23 to page 4, line 12; page 5, lines 3 to 12 particularly lines 5 to 8) in combination with the Figures 1 and 2 as originally filed. The Claims 1 and 3, therefore, comply with Article 123(2) EPC.

#### 3.2 Claim 2

- 3.2.1 Claim 2 comprises the feature "that said support disc has one face provided with a plurality of corrugations (5) formed radially on said support disc". This feature is however not disclosed in the application as filed.

3.2.2 Indeed, from the description (page 2, lines 18 to 22; page 4, lines 3 to 7), Claim 1 and Figures 1 to 8 of the application as filed, it is clear to the person skilled in the art that due to the expression "radial corrugated portion" itself and due to the purpose of the corrugations, namely enhancing the strength of the circular steel plate and using a thinner steel plate, these corrugations present on the disc can be seen from both sides of the corrugated portion of the support disc.

That these corrugations in said support disc correspond to the grooves in the sintered body is also clear from the Figures 1 and 2. The application as filed disclosed therefore only corrugations which could be seen from both sides of the steel disc, whereas a disc having corrugations on only one face was not disclosed at all.

Hence, the wording of Claim 2 (first auxiliary request), which implies the possibility of a support disc having only one face provided with corrugations, has no basis in the application as filed.

3.2.3 The subject-matter of Claim 2, therefore, extends beyond the content of the application as filed within the meaning of Article 123(2) EPC.

#### 4. Novelty

After examination of the documents cited in the European search report the Board comes to the conclusion that none of them discloses a diamond saw having all the features as defined in either Claim 1 or Claim 3. The subject-matter as defined by the independent Claims 1 and 3 is to be considered novel within the meaning of Article 54 EPC.

5. Closest prior art

The pre-characterising portions of the independent Claims 1 and 3 are derived from document D1. From this document it is also known to mount a continuous abrading body on the peripheral edge of a rotary support disc or, respectively, a circular steel plate (cf. column 2, lines 40 to 44; Figures 1 to 3).

Due to the abrading body (12) the known saw is said to saw faster and last longer. Moreover the troughs (14, 15) in the abrading body reduce normal frictional contact of full side walls of the abrading body because of the peaks (16, 17) contacting the hard material being cut. In addition, the troughs permit sludge or pulverised material to escape freely without adding to frictional resistance, further allowing water to circulate through the abrading body and the hard material being cut, and air cooling is enhanced. Thus, the "cutting ability" is improved and the "cutting rate" is increased (cf. column 3, lines 4 to 20).

The subject-matter of each of the independent Claims 1 and 3 differs from the saw known from document D1 by the features concerning the corrugations or corrugated portions as specified in the characterising portions of said claims.

6. Technical problem and solution

In view of the above differences between the closest prior art and the subject-matter according to the independent Claims 1 and 3, the objective problem underlying said subject-matter is to enhance the strength of the rotary support disc or, respectively, circular steel plate (cf. application, page 5, lines 5 and 6 or 11 and 12; Appellant's letter of 8 January 1991, point 4.2).

This problem is solved according to the teaching of Claim 1,

- by providing the support disc with a plurality of corrugations which are in succession of peaks and troughs being formed radially on each side of the support disc, each of said corrugations and each of the grooves of the sintered abrading body are aligned with each other on each face of the support disc,

and according to the teaching of Claim 3,

- by the corrugated portions being radially arranged in the circular steel plate and a part of said corrugated portion and each of said grooves being in alignment.

7. Inventive step

7.1 The basic idea underlying the solution of the above-mentioned problem is, however, already known in the same technical field from document D2.

This document concerns a saw which comprises

- a rotary disc made of metal and provided with corrugations or corrugated portions (6,7), which are in succession of protrusions and troughs being formed radially on each side of the rotary disc or radially arranged in the circular metal plate (cf. page 2, left column, lines 4 to 16; "Resumé": point 1; Figures 1 to 3), and
- a continuous annular abrading body which is fixed to the outer periphery of the disc and consists of a mixture of very hard particles and a bonding powder (cf. page 1, right column, lines 27 to 37).

The purpose of the protrusions and troughs on both sides of the rotary disc is to strengthen said disc in its circumferential and radial directions (cf. page 1, left column, lines 33 to 37). It is clear that this prevents the rotary support disc from being bent by a bending moment and allows therefore the use of metal plate thinner than conventional articles.

The person skilled in the art would immediately realise that this known idea is suitable for solving his problem and thus is also applicable for providing the rotary support disc or circular steel plate as specified in the prior art portion of either Claim 1 or Claim 3. Therefore, the application of corrugations to the support disc of a diamond saw according to document D1, in order to make use of the known advantageous effects of such corrugations, must be regarded as obvious for the person skilled in the art.

- 7.2 Regarding the argument that the feature concerning the alignment of the corrugations or a part of the corrugated portion, "greatly contributes to a solution of the technical problem of improving the cutting ability in increasing the cutting speed", reference is made again to the closest prior art according to document D1. From this document it is already known to improve the "cutting ability" and the "cutting speed" by providing passages of cuttings during cutting operation (cf. above point 5). If these advantages of the known saw are to be maintained, the alignment of each of the corrugations or a part of the corrugated portion with each of the grooves of the sintered abrading body is obtained automatically when combining the teaching of document D2 with that of document D1.

The aforementioned argument submitted by the Appellant in support of inventive step is therefore not persuasive to reverse the above conclusion of obviousness.

- 7.3 For the foregoing reasons, the subject-matter of each of the independent Claims 1 and 3 does not involve an inventive step within the meaning of Article 56 EPC.
8. Consequently, neither Claim 1 (no inventive step), nor Claim 2 (subject-matter extending beyond the content of the application as filed), nor Claim 3 (no inventive step) is allowable.
9. Hence, it follows that the invention to which the present European application relates does not meet the requirements of the EPC (Article 97 EPC). Thus, all requests have to be rejected and the appeal dismissed.
10. The Board has also looked into the application as filed and comes to the conclusion that it does not contain any feature which could have been considered as imparting patentability to the subject-matter of any of the independent claims.

Order

For these reasons, it is decided that:

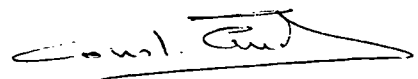
The appeal is dismissed.

The Registrar:



N. Maslin

The Chairman:



C. Andries

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