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**Datasheet for the decision  
of 10 April 2024**

**Case Number:** T 2177/21 - 3.2.07

**Application Number:** 16755267.8

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**Language of the proceedings:** EN

**Title of invention:**  
ROTATING TOOL

**Patent Proprietor:**  
Sumitomo Electric Industries, Ltd.

**Opponent:**  
CERATIZIT Balzheim GmbH & Co. KG

**Headword:**

**Relevant legal provisions:**  
EPC Art. 54, 56, 83, 123(2)  
RPBA 2020 Art. 12(6)

**Keyword:**

Amendments - extension beyond the content of the application  
as filed (no)

Sufficiency of disclosure - (yes)

Novelty - (yes)

Inventive step - (yes)

Late-filed objection - should have been submitted in first-  
instance proceedings (yes) - circumstances of appeal case  
justify admittance (no)

**Decisions cited:**

T 0063/06, T 1919/11

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 2177/21 - 3.2.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.07**  
**of 10 April 2024**

**Appellant:** CERATIZIT Balzheim GmbH & Co. KG  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
3 November 2021 concerning maintenance of the  
European Patent No. 3263256 in amended form.**

**Composition of the Board:**

**Chairman** V. Bevilacqua  
**Members:** S. Watson  
M. Millet

## **Summary of Facts and Submissions**

I. An appeal was filed by the opponent against the decision of the opposition division maintaining European patent Nr. 3 263 256 in amended form according to the main request.

II. The opposition division found that the set of claims according to the main request fulfilled the requirements of Article 123(2) EPC, the subject-matter of the claims was novel and inventive (Articles 54 and 56 EPC) and the claimed invention was sufficiently disclosed (Article 83 EPC).

III. In preparation for oral proceedings, the board gave its preliminary opinion in a communication pursuant to Article 15(1) RPBA, dated 15 December 2023, which took into account the opponent's statement of ground of appeal as well as the patent proprietor's reply to the appeal.

Neither party responded substantively to the board's communication.

IV. Oral proceedings before the board took place on 10 April 2024.

At the conclusion of the proceedings the decision was announced. Further details of the oral proceedings can be found in the minutes.

V. The final requests of the parties are as follows:

for the opponent ("appellant") that  
- the decision under appeal be set aside, and

- the patent be revoked in its entirety.

for the patent proprietor ("respondent") that

- the appeal be dismissed, or
- if the decision under appeal is set aside, that the patent be maintained in amended form on the basis of one of the sets of claims according to auxiliary requests 1 to 8.

VI. The following documents are referred to in this decision:

- D1: Schedler, W., "Hartmetall für den Praktiker" Plansee TIZIT GmbH, VDI-Verlag GmbH, 1988, pages 42-43; 222-229
- D2: "Technisches Handbuch der Metallzerspanung" Sandvik Coromant, October 2005, page D160
- D3: "Bohr- und Fräswerkzeuge 2014/2015" Klenk, November 2014
- D4: "Facts Customer magazine for coating technology" No. 39, CemeCon, September 2013
- D5: "Facts Customer magazine for coating technology" No. 33, CemeCon, December 2008
- D7: EP 1 184 114 A2
- D9: JP 5890413 A
- D9': Machine translation into English of D9
- D10: JP 57184616 A
- D10': Machine translation into English of D10
- D11: Chong, C. W., "Research and Development of multi purpose carbide end mill", University of Southern Queensland, 2005, pages 25-32 and 52-65
- D12: JP 2006/082206 A
- D12': Machine translation into English of D12.

VII. Independent claim 1 of the main request reads as follows (amendments shown with respect to claim 1 as granted):

"A rotating tool (10) comprising:  
a base member (11) including a cutting edge portion (3) and a flute portion (4); and  
a coating film (12) that coats a surface of the base member (11),  
a ratio B/A of a film thickness B of the coating film (12) coating a surface of the flute portion (4) to a film thickness A of the coating film (12) coating a surface of the cutting edge portion (3) being ~~more than 1.0~~ 1.01 to 3.90,  
the film thickness A is not less than 0.1 m and not more than 10 m, and  
a material of the coating film is not less than one compound composed of:  
at least one element selected from a group consisting of a group 4 element, a group 5 element, a group 6 element in a periodic table, aluminum, and silicon;  
and at least one element selected from a group consisting of boron, carbon, nitrogen, and oxygen."

VIII. Claim 3 of the main request reads as follows:

"The rotating tool according to claim 1, wherein the rotating tool is a drill."

IX. The wording of the claims of auxiliary requests 1 to 8 is not relevant to this decision so it is unnecessary to reproduce the claims here.

X. The arguments of the parties relevant for the decision are dealt with in detail in the reasons for the decision.

## **Reasons for the Decision**

1. *Article 123(2) EPC - claims 1 and 3*

1.1 The opposition division found that the amendment to claim 1, that the ratio B/A was changed from "not less than 0.8" in claim 1 of the published application to "being 1.01 to 3.90" in claim 1 of the main request, did not add subject-matter.

The opposition division reasoned that the claimed range was directly disclosed in paragraph [0030] of the published application as a combination of a narrower preferred range and a partial range lying within, and to one side of, the disclosed general range, according to established case law.

1.1.1 The appellant argued that the combination of lower limit 1.01 and upper limit 3.90 was arbitrary and not directly and unambiguously disclosed.

The upper limit 3.90 was only disclosed together with a lower limit of either 1.05 or 1.22, and the lower limit 1.01 was only disclosed as the lower limit of an open-ended range.

The appellant referred to decision T 1919/11 (Reasons, 2.2.2) and argued that the present case was analogous as the two values, 1.01 and 4.15, were present in separate sentences in paragraph [0030] so that their combination was arbitrary and did not represent a general range.

Therefore, according to the appellant, the established case law relating to combinations of preferred ranges

and partial general ranges did not apply and the range 1.01 to 3.90 was not directly and unambiguously disclosed so that the amendment contravened Article 123(2) EPC.

- 1.1.2 The board, however, agrees with the findings of the opposition division and the arguments of the respondent, that paragraph [0030] would be understood by the skilled person as referring to a general range between 1.01 and 4.15, not to an open range with a lower limit of 1.01.
- 1.1.3 Although the value of 1.01 is mentioned in a first sentence and the value 4.15 in a second sentence, the two sentences are clearly linguistically linked through the use of the word "moreover" and would be read by the skilled person as referring to a range.

The board does not see an analogy to the case in T 1919/11 as in that case no ranges were shown but rather in one sentence a list of possible lower limits for the silver concentration and in a second sentence a list of possible upper limits for the silver concentration were disclosed. As there was no indication to the skilled person in what manner the values should be combined, the competent board in that case found that the claimed range represented an arbitrary combination. A general range was defined as having "a lower limit which is unequivocally combined with an upper limit" (see T 1919/11, Reasons 2.2.2).

In the present case the values are clearly linked through the wording of the two sentences and no lists of possible upper and lower limits are present, so that an unequivocal combination can be identified.



1.1.4 Therefore the range 1.01 to 3.90 has been formulated by combining the lower limit of a general range (1.01 to 4.15) with the upper limit of a preferred range (1.22 to 3.90). This is considered to be directly and unambiguously derivable from the application documents as originally filed, according to established case law, as set out in the Case Law of the Boards of Appeal ("CLB"), 10th edition 2022, II.E.1.5.1 a).

1.2 The appellant argued further that paragraph [0030], due to its reference to Table 1, referred only to end mills with particular coating compositions. Therefore the claimed values for the B/A ratio were not disclosed for other rotating tools or for any other coating compositions than those used in the examples shown in Table 1.

Additionally, according to the appellant, paragraph [0016] only referred to the original scope of claim 1 (ratio B/A being not less than 0.8). No examples were present in the application as originally filed showing drills having a B/A ratio above 1.01.

1.2.1 The board, however, agrees with the opposition division's findings and the arguments of the respondent.

The passage cited by the opposition division from paragraph [0016] of the published application is understood by the skilled person as a general reference that the rotating tool mentioned in the description is not confined to the illustrated end mill but also encompasses any rotating tool with the features set out in paragraph [0016], in particular drills, routers and reamers.

1.2.2 Therefore the skilled person directly and unambiguously derives that the "rotating tool 10" referred to in paragraph [0030] of the published application may be any of the rotating tools specified in paragraph [0016] of the published application.

1.2.3 The board is also not convinced by the appellant's argument that the reference to Table 1 in paragraph [0030] would lead the skilled person to understand that only end mills with specific coatings are included under "rotating tool" in the paragraph.

The skilled person, when reading the application documents, understands that paragraph [0030] is subordinate to paragraph [0016] due to the structure of the description including the headings before paragraphs [0014], [0017] and [0022]. Therefore they would understand that the disclosure of paragraph [0016] also applied to the disclosure of paragraph [0030]. The reference to the examples shown in Table 1, and the lack of any specific examples showing a drill with a B/A ratio above 1.01, would therefore not be seen as limiting the disclosure of paragraph [0030] to only the specific end mills shown in Table 1.

1.3 The appellant also contested the opposition division's findings that claim 3, where the rotating tool is specified to be a drill, did not contravene the requirements of Article 123(2) EPC.

The appellant's arguments on this point correspond to the arguments made in connection with its second objection to claim 1.

For the same reasons as given above in point 1.2, the board is therefore of the view that claim 3 fulfils the requirements of Article 123(2) EPC.

1.4 The appellant has therefore not convincingly shown that the opposition division was incorrect in finding that the requirements of Article 123(2) EPC were fulfilled.

2. *Article 83 EPC*

2.1 The opposition division found that the invention was disclosed in a manner sufficiently clear and complete to be carried out by the person skilled in the art.

2.2 The appellant argued that the invention is not sufficiently disclosed as the skilled person is not able to carry out the invention across the whole scope of the claim, in particular the claimed range of ratio B/A for all coating material combinations; tool types and coating thicknesses cannot be obtained (see statement of grounds of appeal, pages 5 to 11).

2.2.1 The appellant essentially argued that only a small number of the examples in the contested patent show a ratio of B/A which falls within the claimed range of 1.01 to 3.90. From these examples it is not possible to extrapolate the teaching for all types of coating compositions, coating thicknesses, and tool geometries. The skilled person cannot carry out the invention in particular at higher B/A ratio values without undue burden as a research programme would be necessary, varying the process and product parameters to try to achieve the claimed invention.

2.2.2 Regarding the burden of proof, the appellant referred to decision T 63/06 and argued that the patent

proprietor had not discharged its own burden of proof as the small number of examples in the contested patent only gave rise to a weak presumption of sufficiency across the very broad claim. It was therefore unnecessary for the appellant to provide detailed experimental evidence as the doubts raised were of a sufficiently serious nature to reverse the burden of proof and require the respondent to prove that the invention could be carried out across the whole range of the claim.

Referring to the case law (see CLB, *supra*, III.G.5.1.2 c), eighth paragraph) the appellant argued that as soon as an opponent shows that there is only a weak presumption of sufficiency of disclosure then the burden of proof is discharged through comprehensible and plausible arguments.

- 2.3 The board notes that a successful objection of insufficient disclosure presupposes that there are serious doubts, substantiated by verifiable facts (see CLB, *supra*, II.C.9). As a general rule, the burden of proof lies with the opponent to show that the claim cannot be carried out.
- 2.4 In the present case, the board does not agree with the appellant that there is only a weak presumption of sufficiency of disclosure and that therefore the case law to which the appellant referred to (see CLB, *supra*, III.G.5.1.2 c) eighth paragraph) applies to the present case.

As argued by the respondent, the contested patent teaches how to produce tools according to the invention in paragraphs [0043] to [0076] and has a number of worked examples in Tables 1 and 4 which are in accordance with claim 1 of the main request.

The film formation is carried out using a High Power Impulse Magnetron Sputtering (HiPIMS) method which is described in paragraphs [0006], [0013], [0027], [0028] and [0036] to [0042] of the contested patent, also with reference to a prior art reference document. The appellant does not dispute that HiPIMS coating was in commercial use before the priority date of the patent.

As reasoned by the opposition division, the contested patent shows that this coating can be used on different tool forms and using different film thicknesses, for example in Tables 1, 2 and 4, and suggests which process parameters control the deposition, and influence the value of the B/A ratio (see decision under appeal, page 5, third paragraph and page 6, second paragraph).

Therefore, there is a strong presumption that the claimed invention is sufficiently disclosed and the burden of proof is on the appellant to demonstrate that it was not possible to carry out the invention without undue burden.

2.5 The appellant's assertions to the contrary are unsubstantiated. No evidence has been submitted showing that the claimed range for ratio B/A cannot be obtained for a particular tool geometry, coating composition and/or coating thickness (see reply to the appeal, pages 4 to 8).

No evidence has been provided showing that these examples cannot be obtained by following the method set out in the contested patent.

The contested patent teaches that the parameters influencing the B/A ratio are pulse width, pulse power density, pulse average power, bias voltage and film formation time and that increasing pulse width and decreasing bias voltage, increases the ratio B/A as shown in Table 1, samples A to F (paragraphs [0041], [0042], [0044] to [0047],[0061] and [0062]).

2.6 In the absence of any evidence to the contrary, the board agrees with the opposition division's reasoning that the skilled person does not face an undue burden when carrying out the invention for tool geometries, coating compositions and thicknesses falling within the scope of the claim but not shown in the worked examples 4, 6, 9, A to E and G (decision under appeal II.5.3).

2.6.1 The appellant argued that there was no clear teaching that increasing pulse width and decreasing bias voltage increases the B/A ratio as sample 36 and sample G in Table 4 show that both should be decreased and samples 1 to 4 in Table 1 teach that the pulse width should be increased but the bias voltage kept constant to increase B/A (see statement of grounds of appeal, page 7, third to fifth paragraphs).

2.6.2 However, as the respondent argues, the existence of more than one way of influencing the B/A ratio does not lead to the contested patent lacking sufficiency (reply to the appeal, point 5.13).

2.6.3 In the board's view, in the absence of any verifiable facts demonstrating the contrary, the varying of two process parameters within a restricted range represents a reasonable amount of trial and error and not a research programme (see CLB, *supra*, II.C.6.7).

2.7 The appellant has therefore not convincingly shown that the opposition division was incorrect in finding that the claimed invention is sufficiently disclosed.

3. Article 54 EPC - claim 1

3.1 The opposition division found that documents D9, D10 and D7 did not disclose a rotating tool comprising a ratio  $B/A$  of a film thickness  $B$  of the coating film coating a surface of the flute portion to a film thickness  $A$  of the coating film coating a surface of the cutting edge portion being 1.01 to 3.90 (see decision under appeal, point II.6.1 to II.6.3).

3.2 *Novelty in view of document D9*

3.2.1 The appellant argues that the opposition division was incorrect in its finding that the skilled person would not calculate the  $B/A$  ratio in document D9 by selecting and measuring the coating of two points out of four in regions where no coating layer is present (see decision under appeal, point II.6.1).

3.2.2 According to the appellant, following the method described in the contested patent (paragraph [0030]), the skilled person, picking four arbitrary points in the cutting edge portion, would pick two points on the peripheral flank 12 and two on the rake surface 14. This would lead to a ratio  $B/A$  of 2 (see statement of grounds of appeal, page 14).

3.2.3 The board, however, agrees with the opposition division that the skilled person, with the intent to measure a coating thickness, will not select two out of four points to measure which are uncoated.

The description in paragraph [0030] of the contested patent teaches that "film thicknesses" of four arbitrary points of the respective cutting edges are measured to calculate "a total value of all the values of measured film thicknesses A".

3.2.4 In addition, as argued by the respondent, the drawings in D9 are schematic and no direct and unambiguous disclosure with respect to thicknesses, whether absolute or comparative, is derivable. There is no direct and unambiguous disclosure that the film thickness of the coating on all surfaces is uniform (see reply to the appeal, point 6.3 and 6.7).

3.2.5 The appellant also argued that there will be an intermediate product during production of the end mill of document D9 which will still have a coating film on the clearance face adjacent the cutting edge which is thinner than it was immediately after coating (statement of grounds of appeal, page 15, third and fourth paragraphs).

The appellant has not given any indication where this is disclosed in document D9. The board agrees with the respondent that the appellant has only speculated on what may occur during production of the tool, but document D9 does not directly and unambiguously disclose the claimed combination of features (see reply to the appeal, point 6.8).

3.2.6 It also appears that the feature of thickness A being not more than 10  $\mu\text{m}$  in combination with the ratio B/A being 1.01 to 3.90 is not directly and unambiguously derivable from document D9 as the coating thickness is described as between 3 and 20  $\mu\text{m}$  (D9, abstract and claim 1).



3.2.7 Therefore the subject-matter of claim 1 appears to be novel in view of the disclosure of D9.

3.3 *Novelty in view of document D10*

3.3.1 The appellant argued that, in document D10, as the clearance surface directly adjacent the cutting edge is polished to locally remove the coating layer, the average film thickness A at the cutting edge portion will be smaller than the film thickness in the flute portion (statement of grounds of appeal, paragraph bridging pages 15 and 16).

3.3.2 The opposition division found, for similar reasons as for document D9, that the skilled person could not directly and unambiguously derive the ratio B/A being 1.01 to 3.90 from the disclosure that a portion of the coating is removed (decision under appeal, II.6.2).

3.3.3 The board agrees with the opposition division that the skilled person, when determining the B/A ratio will not measure a point on either the flute or cutting edge portion where there is no coating, for the same reason as given above for document D9, namely that the skilled person, when seeking to measure a coating thickness would not choose two out of four measurement points in areas where no coating is provided.

3.3.4 The combination of thickness A being not more than 10  $\mu\text{m}$  in combination with the ratio B/A being 1.01 to 3.90 is also not directly and unambiguously derivable as the coating thickness in document D10 is described as between 0.3  $\mu\text{m}$  and 20  $\mu\text{m}$  (D10, abstract and claim 1).

3.4 *Novelty in view of document D7*

- 3.4.1 The appellant argued that during use of the drill of D7, abrasion would reduce the film thickness A in the cutting edge portion so that the ratio B/A would increase and inevitably become larger than 1.01 (see statement of grounds of appeal, page 16, fifth and sixth paragraphs).

According to the appellant, figure 3 of D7 showed a uniform coating across the flute and cutting edge portions. Figure 7A of D7 showed a gradual wear of the cutting face in comparison to the flute portion. The skilled person was also aware from their common general knowledge that the forces at the cutting edge would be higher, especially during the initial cutting stages, leading to greater wear, whereas the wear at the flute portion would be negligible.

From figure 3 it could be seen that the flute portions had more body mass than the cutting edge portion to absorb the heat generated during cutting so that wear on the flute portion would be minimal.

As the claimed ratio only required the film thickness at the cutting edge portion to be minimally less than the film thickness of the flute portion, it was inevitable that there was a transition point where the tool film thicknesses showed the claimed ratio.

The tool could be removed from the machine at that point and would show all the features of claim 1.

- 3.4.2 The board however agrees with the respondent that the appellant has not provided any evidence supporting the speculation that there is negligible wear on the flute

and that the coating wear is uniform in general and no chipping occurs.

- 3.4.3 The board agrees with the findings of the opposition division in the decision under appeal that as figure 7A of D7 shows wear of more than 0.05 mm after forming a few holes that no conclusion can be drawn regarding the variation of the B/A ratio during drilling as this value is already much higher than the typical thickness of the hard coating (see decision under appeal, page 9, third paragraph).

Figure 7A does not give any indication of how flank face abrasion changes with number of holes drilled, until the abrasion has already reached a level of more than 50  $\mu\text{m}$ .

The appellant's arguments are therefore not convincing.

- 3.4.4 In addition, the opposition division found that it was not implicitly disclosed in D7 that the film thickness A was not less than 0.1  $\mu\text{m}$  and not more than 10  $\mu\text{m}$  (see decision under appeal, page 9, first paragraph).
- 3.4.5 The appellant argued that document D7 disclosed a TiAlN layer which is typically applied using a PVD process where a film thickness of 0.1-10  $\mu\text{m}$  is self-evident for the skilled person (statement of grounds of appeal, page 16, third complete paragraph).
- 3.4.6 The board agrees with the reasoning of the opposition division and the arguments of the respondent that there is no implicit disclosure of the thickness range as document D7 is silent on this point. The skilled person is aware that greater thickness values are also generally known, such as those disclosed in documents

D9 and D10, so that it cannot be considered that the disclosure of a TiAlN coating inherently discloses a film thickness of 0.1  $\mu\text{m}$  to 10  $\mu\text{m}$ .

3.4.7 Document D7 therefore does not disclose the features of a B/A ratio with a range of 1.01 to 3.90, or a film thickness A of 0.1  $\mu\text{m}$  to 10  $\mu\text{m}$ .

3.4.8 The appellant has not convincingly demonstrated the incorrectness of the decision under appeal on this point.

3.5 *Novelty in view of common general knowledge*

3.5.1 In its statement of grounds of appeal, the appellant raised a novelty objection referring to the common knowledge of the skilled person, as well as "common prior art". The appellant relied on documents D2 to D5 and D11. A witness was also offered (see statement of grounds of appeal, pages 16 to 20, point 4.).

3.5.2 This objection is however, not convincing, for the following reasons.  
Firstly, the board agrees with the reasoning of the opposition division, given in its preliminary opinion of 4 March 2021, that in the absence of any quantitative data relating to the film thicknesses in the flute and cutting edge portions, it was not possible from the information contained in documents D2 to D5 and D11 to directly and unambiguously determine the feature relating to the ratio B/A (see annex to summons to oral proceedings, point 10.1.1).

The appellant did not respond to this point in its statement of grounds of appeal and at the oral

proceedings before the board referred only to its written submissions.

- 3.5.3 The board agrees with the respondent's argument that none of the documents cited show the claimed B/A ratio in combination with a thickness A of 0.1  $\mu\text{m}$  to 10  $\mu\text{m}$  (reply to the appeal, point 6.17).

A witness was offered to corroborate that refurbishing of rotary tools has been standard practice in this technical field for many decades and to explain how the refurbishing process typically takes place (see statement of grounds of appeal, page 19, final paragraph).

The witness was however not offered to confirm specific coating thicknesses and thickness ratios found on particular rotary tools belonging to the prior art.

As the function of a witness is to corroborate what has been alleged, it was unnecessary to hear the witness as no factual details relating to specific film thicknesses of particular rotary tools had been indicated by the appellant (see CLB, *supra*, III.G.2.4.1 a)).

- 3.5.4 The board also notes that although document D2, being a handbook, apparently shows common general knowledge, it is not evident, also because the appellant failed to provide any arguments in that respect, why the remaining documents referred to (documents D3 to D5, D11) relate to tools and processes which should also be regarded as forming part of the common general knowledge of the skilled person.

3.5.5 The board is therefore of the opinion that this objection does not prejudice the maintenance of the patent in amended form according to the main request.

3.6 *Novelty in view of D12*

3.6.1 The appellant also argued that the subject-matter of claim 1 was not novel with respect to the disclosure of D12 (see statement of grounds of appeal, pages 20 to 21).

3.6.2 The opposition division, in its preliminary opinion, reasoned that it was not directly and unambiguously disclosed in document D12 that the ratio B/A ever reached a ratio greater than 1 as the variation of the ratio was dependent on the deposition technique selected and the uniformity of the coating (see annex to the summons to oral proceedings, point 10.1.2).

The appellant did not contest this preliminary opinion in opposition proceedings and the statement of grounds of appeal does not mention this point. At the oral proceedings before the board the appellant relied on its written submissions.

The board agrees with the opposition division's reasoning and the arguments of the respondent made in its reply to the appeal, points 6.21 and 6.22. There is no disclosure in document D12 that the ratio B/A during refurbishment reaches a value of 1.01 to 3.90. Document D12 discloses that "if the hard coating having a general thickness (about 2 to 6  $\mu\text{m}$ ) is 3 to 4 layers including the lowermost hard coating provided at the time of new work" there are no lamination issues (see D12', paragraph [0010]). There is no indication of the

thicknesses of the flute portion and cutting edge portion respectively.

3.6.3 The board finds that this objection also does not prejudice the maintenance of the patent in amended form according to the main request.

4. *Article 56 EPC - claim 1 - D7 and common general knowledge*

4.1 In the decision under appeal, the opposition division found that the subject-matter of claim 1 was not obvious over the combination of the teaching of D7 and the common general knowledge of the skilled person (as shown in document D1) (see decision under appeal, point II.7.1).

The opposition division found that two distinguishing features were present in claim 1 with respect to document D7, namely that the ratio  $B/A$  of a film thickness  $B$  of the coating film coating a surface of the flute portion to a film thickness  $A$  of the coating film coating a surface of the cutting edge portion being 1.01 to 3.90 and the film thickness  $A$  is not less than  $0.1 \mu\text{m}$  and not more than  $10 \mu\text{m}$  (see also point 3.4 above).

4.2 The appellant argued that the coating thickness ratio was obvious to the skilled person and the feature of the ratio  $B/A$  being 1.01 to 3.90 was an arbitrary selection with no technical effect.

4.3 The arbitrary nature of the ratio  $B/A$  was demonstrated by comparing sample 4 of the contested patent with comparative sample 29 which achieved the same cutting distance, indicating the wear resistance, even though

sample 29 has a B/A ratio below 1.01 (see statement of grounds of appeal, pages 21 to 22).

The opposition division reasoned in the decision under appeal (page 10, penultimate paragraph), that the achievement of the same cutting distance by both samples could be explained by the increased coating thickness in sample 29, where A was 5.71  $\mu\text{m}$  and B was 4.68  $\mu\text{m}$  (see contested patent, Table 3) when compared with sample 4, where A was 2.99  $\mu\text{m}$  and B was 3.02  $\mu\text{m}$  (see Table 1).

- 4.4 According to the appellant, this showed that the ratio B/A was arbitrary as merely increasing film thickness also gave improved wear resistance, irrespective of the ratio B/A.
- 4.5 In addition, the appellant argued that in particular at the lower end of the claimed range there was no improvement to the wear resistance. This was demonstrated by considering comparative samples 29 and 30, with B/A ratio of 0.82 and 0.90 respectively. Sample 29 showed an improved cutting distance compared with sample 30 although its B/A ratio was lower (contested patent, Table 3). From this it could be concluded that at least at the lower end of the claimed range there was no improvement to the wear resistance of the tool and therefore no technical effect across the whole range of the claim.
- 4.6 The board however agrees with the opposition division's reasoning and the respondent's arguments that there is a technical effect shown by the claimed B/A ratio when considering the test results shown in Table 1 as cutting distance is improved within the claimed B/A ratio (see reply to the appeal, points 7.7 and 7.12).



Samples 4, 6 and A to E show B/A ratios within the claimed range and have improved cutting distances compared to comparative samples with a B/A ratio outside of the claimed range (see Table 1 of the contested patent).

In the board's view, that another sample may also show good wear resistance does not negate the technical effect shown in the contested patent, so that the claimed range of B/A ratio is regarded as demonstrating a technical effect and the objective technical problem to be solved is to provide a tool with improved wear resistance (see paragraph [0007] of the application as published).

4.7 Even if the skilled person were motivated to combine the thickness value given in document D1 with the tool of document D7, they still would not arrive at the claimed B/A ratio, as neither document D7 nor document D1 teaches or suggests to work in the B/A ratio range 1.01 to 3.90 in order to improve the tool life, particularly wear resistance (see decision under appeal, page 10, final paragraph and reply to the appeal, point 7.13).

5. *Article 56 EPC - claim 1 - standard practice of refurbishing as described in D2 together with common general knowledge of D1*

5.1 In its statement of grounds of appeal, the appellant raised an objection of lack of inventive step of the subject-matter of claim 1 in view of the standard practice of refurbishing as described in document D2 (statement of grounds of appeal, page 23).

- 5.2 As noted by the respondent (reply to the appeal, point 7.15), this objection does not form part of the appealed decision and does not appear to have been raised during the opposition proceedings.
- 5.3 Therefore the objection appears to be an amendment to the appellant's case. According to Article 12(6), second sentence, RPBA, a board shall not admit into the appeal proceedings objections which should have been submitted during the proceedings leading to the decision under appeal, unless the circumstances of the appeal case justify their admittance.
- 5.4 The appellant did not give any reasons justifying the admittance of this objection for the first time in appeal proceedings, thereby avoiding a decision of the opposition division on this point. The board cannot see any circumstances which would justify the admittance of the objection. The amended main request was filed with the respondent's reply to the notice of opposition on 6 October 2020, nearly a year before the oral proceedings before the opposition division. The appellant had therefore had sufficient time to formulate objections to the amended claims.
- 5.5 Therefore, as the objection starting from the standard practice of refurbishing was filed for the first time in the appeal proceedings, in the absence of any circumstances justifying its admittance, this objection is not admitted into the appeal proceedings (Article 12(6) RPBA).
6. As none of the objections raised by the appellant prejudices the maintenance of the patent in the amended form found by the opposition division to meet the requirements of the EPC, the appeal must be dismissed.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



G. Nachtigall

V. Bevilacqua

Decision electronically authenticated