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Datasheet for the decision of 18 October 2024

Case Number: T 0928/22 - 3.2.01

Application Number: 14188129.2

Publication Number: 2868413

IPC: B23C5/10

Language of the proceedings: EN

Title of invention:
Hard-coated cutting tool

Patent Proprietor:
UNION TOOL CO.

Opponent:
Rollomatic S.A.

Headword:

Relevant legal provisions:
EPC Art. 52(1), 54, 56, 83, 100(a), 100(b)

Keyword:
Novelty - (yes)
Inventive step - (yes)
Grounds for opposition - lack of patentability (no) - insufficiency of disclosure (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0928/22 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 18 October 2024

Appellant: (Opponent)	Rollomatic S.A. Rue des Prés Bugnons 3 2525 Le Landeron (CH)
Representative:	Geitz Patentanwälte PartG mbB Werthmannstrasse 15 79098 Freiburg (DE)
Respondent: (Patent Proprietor)	UNION TOOL CO. 17-1, Minami-Ohi 6 Shinagawa Tokyo (JP)
Representative:	Kramer Barske Schmidtchen Patentanwälte PartG mbB European Patent Attorneys Landsberger Strasse 300 80687 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 11 February 2022 rejecting the opposition filed against European patent No. 2868413 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairwoman	S. Mangin
Members:	V. Vinci
	A. Jimenez

Summary of Facts and Submissions

I. The appeal lies against the decision of the Opposition Division rejecting the opposition filed against European patent No. 2 868 413.

In its decision, the Opposition Division found that the grounds for opposition pursuant to Article 100(a) in combination with Articles 54 and 56 EPC and Article 100(b) in combination with Article 83 EPC were not prejudicial to the maintenance of the patent as granted and rejected the opposition. Novelty and inventive step within the meaning of Articles 52(1), 54 and 56 EPC were assessed in view of the following documents:

D1: JP 2011 101910 A
D1a English translation of the claims and the description of D1
D2: D2 US 5 074 721 A
D3: DE 10 2011 076 584 A
T1: Edge radius before/after resharpening - Measurement report
T2: Edge radius after resharpening 2nd Test campaign
T3: Edge radius analysis 3rd test campaign - Keyence measurement V1 .0
T4: Edge radius after resharpening 3rd Test campaign
T5: Theoretical determination of the radius obtained after sharpening
T6: Appendix of the report "Theoretical determination of the radius obtained after sharpening"

During the appeal proceedings the appellant (opponent) filed following additional evidence:

D1a': Amended English translation of the claims of D1.

D22: Ernst Widmer, *"Drehen und Gewindeschneiden"*, 1978, Verlag Springer Basel.

D23: Magnus Otto Enssle, Doctoral Thesis *"Standwegverlängerung durch gezielte Änderung der Mikrogeometrie an Diamantwerkzeugen für die Holz- und Holzwerkstoffbearbeitung".*

D24: Wikipedia article retrievable at *https://de.wikipedia.org/wiki/Schneidteil#Keilwinkel)*

T7: Second appendix of the report *"Theoretical determination of the radius obtained after sharpening"*

II. With a communication pursuant to Article 15(1) RPBA dated 3 June 2024 the Board informed the parties of its preliminary assessment of the case.

Oral proceedings pursuant to Article 116 EPC were held before the Board on 18 October 2024 by videoconference.

III. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form on the basis of one of the auxiliary requests I to IV filed with the reply to the statement of grounds of appeal. Further auxiliarily, it is requested that the patent be maintained in amended form on the basis of each of the main request and auxiliary requests I to IV with any one of independent claims 1 and 2 being

deleted and the dependent claims being renumbered accordingly.

IV. Independent claim 1 as granted reads as follows (labelling according to the decision under appeal):

1a) *"A hard-coated cutting tool including*

1b) *a tool body (7)*

1c) *coated with a hard coating (4)*

1d) *and having a cutting edge (3) formed on a ridge line*

1e) *intersecting a flank face (1) and a rake face (2),*

1f) *wherein the thickness h1 of the hard coating (4) on the flank face side and the thickness h2 of the hard coating (4) on the rake face side near the cutting edge (3) satisfies the following two conditions in a cross-section perpendicular to the cutting edge (3) in a range equal to or less than 0.3 times the tool diameter in the axial direction from the tip of the tool:*

1g) $8\mu m \leq h1 \leq 30\mu m$ *; and*

1h) $0 \leq h2/h1 < 0.5$*,*

1i) *and the following condition is further satisfied when the roundness of the edge of the cutting edge (3) is approximated by a circular arc having radius R in the direction perpendicular to the cutting edge (3) in a range equal to or less than 0.3 times the tool diameter in the axial direction from the tip of the tool:*

*0.1*h1 ≤ R ≤ 0.8*h1"*

Independent claim 2 contains the same features 1a to 1h of claim 1 as granted renumbered by the opposition division as features 2a to 2h. However, feature 1i has been modified to read:

2i) *"and the following condition is further satisfied when the roundness of the edge of the cutting edge (3) is approximated by a circular arc having radius R in the direction perpendicular to the cutting edge (3) in a range equal to or less than 0.3 times the tool diameter in the axial direction from the tip of the tool:*

*0.1*h1 ≤ R ≤ 15µm."*

Reasons for the Decision

MAIN REQUEST - PATENT AS GRANTED

Article 100(b) in combination with Article 83 EPC

1. The ground for opposition pursuant to Article 100(b) in combination with Article 83 EPC is not prejudicial to the maintenance of the patent as granted, as correctly found by the opposition division.

1.1 The parties at the oral proceedings referred in this respect to the arguments provided in writing and did not make any further submission. The Board has thus no reasons to deviate from its preliminary assessment of

compliance with the requirements of Article 83 EPC as set out in the communication according to Article 15(1) RPBA dated 3 June 2024 which is herewith confirmed and reads as follow:

1.2 With their appeal the appellant (opponent) contested the conclusion of the opposition division that the patent as granted complied with the requirements of Article 83 EPC. In this regard, they referred to original Figures 2, 5, 8 and 10 as well as to an annotated version of Figures 3 and 6 of the contested patent presented and commented on pages 3 to 5 of their statement of grounds of appeal. The appellant (opponent) argued that the person skilled in the art was not able to identify which one of the four different radii labelled R and R_2 to R_4 allegedly identifiable on Figures 8, 10, 6 and 3 respectively was the radius R recited in features 1i and 2i of independent claims 1 and 2 as granted. The appellant (opponent) expressed the view that since it was not clear which one of the above four different radii was meant in claims 1 and 2 and since neither the description nor the figures allowed a clear and unambiguous assignment of this geometrical parameter to the claimed cutting tool, the invention was not sufficiently disclosed for it to be carried out by a person skilled in the art without undue burden.

1.2.1 The Board is not convinced for the following reasons:

As correctly observed by the opposition division and the respondent (patent proprietor), radii R2, R3 and R4 referred to by the appellant (opponent) in their statement of grounds of appeal have been arbitrary identified and outlined in Figures 6 and 3 respectively. However, the patent does not provide any

indication that also these radii are meant in claims 1 and 2 by the feature *"radius R"*. The radius R according to the patent and recited in features 1i and 2i of the independent claims is unambiguously the radius shown in Figures 8 and 10 of the patent. This is confirmed by the description of the drawings in paragraph [0022] of the contested patent. Furthermore, paragraph [0040] of the patent describes quite in details one practical way to carry out the measurement of the radius R indicated in Figures 8 and 10, this information allowing the person skilled in the art to determine whether they are working within the scope of the claim. Therefore, the objection of the appellant (opponent) under Article 83 EPC is unfounded as correctly stated by the opposition division in the contested decision which is thus confirmed in this respect.

Article 100(a) in combination with Article 54 EPC

2. The ground for opposition pursuant to Article 100(a) in combination with Article 54 EPC is not prejudicial to the maintenance of the patent as granted, as correctly found by the opposition division.

2.1 With their appeal, the appellant (opponent) contested the findings of the opposition division that the subject-matter of independent claims 1 and 2 as granted was novel over each of documents D3, D1/D1a and D2.

Novelty over D3

2.2 The appellant (opponent) held that, contrary to the assessment of the opposition division, the condition 1g recited in claim 1 as granted was directly and unambiguously derivable from document D3 and that the condition 1i could be implicitly read in document D3 by

a person skilled in the art in view of common general knowledge. Conversely, the respondent (patent proprietor) expressed the opinion that in addition to the distinguishing features 1g and 1i acknowledged by the opposition division in the contested decision, also the range for the ratio h2/h1 recited in feature 1h was not directly and unambiguously disclosed in D3. The same submissions were made regarding features 2g, 2h and 2i of independent claim 2 as granted.

Features 1g and 2g

2.3 The appellant (opponent) alleged that feature 1g could be derived from claim 7 of D3 suggesting a range for the thickness of the hard coating on the flank face between 0.001 mm and 3mm, and this because this known range contained the sub-range recited in claim 1.

2.3.1 The Board does not agree for the following reasons:

The broader range for the thickness of the hard coating on the flank face in claim 7 of D3 expressed in µm varies from 1µm to 3000µm. The claimed range 8µm ≤ h1 ≤ 30µm recited in feature 1g of claim 1 is a sub-range of the broader prior art range. This sub-range is clearly narrow compared to the main range suggested in claim 7 of D3 and is undisputable that the upper end of the claimed range, i.e. 30µm, is very far removed from the upper end of the broader range of the prior art which is set at 3000µm. Finally, contrary to the appellant's (opponent's) view, the Board considers that also the claimed lower end of the range recited in feature 1g of claim 1 as granted, i.e. 8 µm, is far removed from the lower end of the prior art range which is set at 1µm. Last but not least, the Board observes that the preferred range for the hard coating thickness also

indicated in claim 7, i.e. 0.05mm to 0.3mm (50µm to 300µm) lays fully outside the claimed range and considerably spaced away therefrom. Therefore, the skilled reader would not be inclined to select a value for the thickness of the hard coating on the flank face falling within the claimed sub-range. Under these circumstances and according to established case law of the Boards of Appeal, the broader range disclosed in D3 is not prejudicial to novelty of the sub-range according to feature 1g of claim 1. Turning to the broader range (0,2mm-3mm) disclosed in paragraph [0012] of D3 referred to by the appellant (opponent), the Board follows the interpretation of this passage provided by the respondent (patent proprietor) that the value indicated in this passage refers to the thickness of the hard coating before any reduction and not to the thickness of the hard coating of the end product. This passage can therefore not be taken to show that the thickness range h1 in D3 is outside the range of the patent as the thickness will be further reduced. In view of all the above, the Board confirms the finding of the opposition division that features 1g and 2g of claims 1 and 2 as granted are not directly and unambiguously disclosed in D3.

Features 1h and 2h

2.4 The respondent (patent proprietor) put forward that, contrary to the findings of the opposition division, the last sentence of the cited paragraph [0029] of D3 did not disclose a ratio h2/h1 according to features 1h and 2h of independent claims 1 and 2 and as granted. It was argued that, at the most, the person skilled in the art could derive from this passage that the initial thickness of the hard coating (4) was reduced by 50% in the regions adjacent to the cutting edge of the tool.

This resulted in a ratio h2/h1=0.5 which is outside the range claimed in features 1h and 2h of claims 1 and 2 as granted which did not comprise the value 0.5.

2.4.1 The Board is not convinced:

Although paragraph [0029] relates to the embodiment in Figure 3 according to which the thickness of the hard coating on the flank and rake face after reduction appear to be the same (ratio h2/h1=1), the Board is convinced that the person skilled in the art would implicitly assume that the same reduction ratio applies to the embodiment according to Figure 2 cited by the appellant (opponent) against claims 1 and 2 as granted according to which only the thickness of the hard coating on the rake face is reduced. Paragraph [0029] teaches that the suggested reduction is not exactly 50%, but around 50% (*"um ca.50%"*). This results in a ratio h2/h1 which can be slightly less (or more) than 0.5 and thus falling within the range of features 1h and 2h of claims 1 and 2 as granted. These features are thus directly and unambiguously disclosed in D3 as correctly found by the opposition division.

Features 1i and 2i

2.5 The appellant (opponent) criticized the statement under point 19.1 of the contested decision were the division concluded that D3 *"does not mention anywhere the radius"* and that *"D3 does not mention any values of the radius neither suggests the roundness should be replaced by another one with a smaller radius..".* In this respect, the attention of the Board was drawn to paragraphs [0028] and [0029] and Figures 2 of D3 disclosing and showing a curvature (*"stumpfe Rundung (5)"*) bridging the rake face and the flank face and

hence of a radius within the meaning of claims 1 and 2 as granted. The appellant (opponent) further argued that the person skilled in the art, namely an expert in the design and manufacturing of cutting tools, was aware that this radius depended (1) on the so-called wedge angle β formed between the flank face and the rake face, (2) on the initial thickness of the hard coating and (3) on the amount of the subsequent reduction of this thickness in proximity of the cutting edge. In support of this assertion the appellant (opponent) filed *"in-house"* produced calculations, measurements and tests labelled as evidence T1 to T7. Evidence T5 demonstrated that it was possible to express the radius obtained after sharpening the cutting edge as a function of the wedge angle β and of the thickness of the hart coating h1 and h2 measured on the flank and rake face respectively. It was alleged that since in order to arrive to the equation expressing the radius as function of these geometrical parameters of a cutting tool (see page 8 of T5), the person skilled in the art only applied well known mathematical geometrical and trigonometrical considerations, this equation belonged to common technical knowledge. Consequently, the values of the radius calculated by applying this equation to commonly adopted values of the wedge angle β ranging between 5° to 95° and to hard coating thickness h1 and h2 according to features 1g and 1h of claims 1 and 2 as presented in a numerical form in the tables of page 4 and 5 of T6 and in a graphical representation in evidence T7, also belonged to common general knowledge to be taken into account when assessing the actual and complete disclosure of D3. The appellant (opponent) concluded that the results presented in the tables of T6 relative to wedge angles β ranging between 45° and 65° which in their view characterised drills or milling

cutters of the kind disclosed in D3, showed that the conditions 1i and 2i were verified for all the values of h1 and h2/h1 covered by claims 1 and 2. The very few exceptions to this fact were marked in red in the tables of T6 and related to wedge angles β ranging between 75° and 95° which were not normally adopted in the cutting tool of D3. In the appellant's (opponent's) opinion, this was confirmed by the non-patent literature D22 to D24 submitted during the appeal proceedings. These exceptions had thus to be disregarded when reading document D3. To summarize, the appellant (opponent) expressed the opinion that on the basis of common general knowledge the person skilled in the art would implicitly read in document D3 values for the radius R that - for h1 and h2/h1 according to features 1g and 1h of claim 1 and at least for all the commonly adopted wedging angles - inherently satisfied condition 1i. The same conclusion applied to condition 2i of claim 2 as granted.

2.5.1 The respondent (patent proprietor) contested that view of the appellant (opponent) that the content of evidence T1 to T7 belonged to common general knowledge. In their view, the complexity of the calculations required to arrive to the equation presented on page 8 of T5 spoke against this assumption. It was further argued that since document D3 did not disclose a value of h1 within the range of feature 1g, the values of R showed in the tables of T6 were the result of an arbitrary selection of the parameter h1 which could not prejudice novelty of features 1i and 2i. Finally, the respondent (patent proprietor) pointed out that there was no technical reason for ruling out wedge angles ranging from 75° to 95° which according to the tables of T6 led, at least in certain cases, to values of the R outside the range claimed in features 1i and 2i of

claims 1 and 2 as granted.

2.5.2 The arguments submitted by the appellant (opponent) are not convincing for the following reasons:

The Board concurs with the appellant (opponent) that the cutting tool of D3 is provided with a radius located at its tip, namely at the intersection between the flank face and the rake face. This is clearly derivable from paragraphs [0016], [0028] and [0029] read in combination with Figure 2 of this prior art document. However, no dimensioning of this radius, let alone a range of values thereof expressed in terms of the thickness of the hard coating on the flank face of the cutting tool are suggested in D3. Furthermore, the Board takes the view that - contrary to the opinion of the respondent (patent proprietor) - the person skilled in the art, based on their common general knowledge, is able to obtain the mathematical formula expressing R as a function of h1, h2 and of the wedge angle β as presented on page 8 of evidence T5. It follows that also the results of the tests presented in T6 and T7 and obtained by applying this formula belong to common general knowledge that the person in the art applies to determine the actual extent, be it explicit or implicit, of the disclosure of D3. However, the Board does not share the assumption of the appellant (opponent) that the person skilled in the art would inherently restrict the wedge angle β of the cutting tool of D3 to the range 45° to 65° where the conditions 1i and 2i are always verified. As a matter of fact, D3 generally relates to generic cutting tools. Drills or milling cutters are presented as a mere and non-exhaustive examples of applications (see paragraph [0027]). Therefore, the Board cannot see any reasons for the person skilled in the art to inherently assume

that the cutting tool of D3 has mandatorily a wedge angle in the range 45° to 65°. The contrary is not proved by the above cited non-patent literature D22-D24. As an example, the *"Wikipedia"* article D24 teaches in the last page, section labelled *"Keilwinkel"*, that the wedge angle could be selected between 60° and 120°. As a consequence, there is no reason for the person skilled in the art to disregard the value of the radius in the tables of T6 obtained for wedging angle ranging for example between 75° and 95° which at least in part do not satisfy conditions 1i and 2i of claims 1 and 2 as granted. In view of all the above, it cannot be assumed that by selecting values of h1 and h2 in the cutting tool of D3 such as to meet conditions 1g and 1h of claims 1 and 2, the resulting radius will automatically fall within the claimed ranges as the result of a *"one-way street"* situation. Last but not least, since contrary to the view of the appellant (opponent) the range according to feature 1g is not directly and unambiguous disclosed in D3, beside the choice of a wedge angle between 45° and 65°, a further selection is required to automatically obtain a radius meeting conditions 1i and 2i of claims 1 and 2 as granted. In view of all above D3 does not disclose, either explicitly nor implicitly, also features 1i and 2i of claims 1 and 2 as granted.

2.6 To summarize, document D3 fails to disclose features 1g and 1i of claim 1 and the corresponding features 2g and 2i of claim 2 as granted as correctly assessed by the opposition division.

Novelty over D1/D1a'

2.7 With the reply to the communication pursuant to Article 15(1) RPBA, the appellant (opponent) filed a corrected

English translation D1a' of the claims of document D1 to demonstrate that - contrary to the previous version and to the opinion of the opposition division - dependent claims 5 was dependent on at least one of claims 1 and 4 and that claim 6 was dependent on claim 5. The Board agrees with the appellant (opponent) that these dependencies appearing in the new filed claim translation are also recognizable from the claims of the original Japanese document D1 even for someone who is not familiar with the Japanese language. This was not contested by the respondent (patent proprietor). The Board also observes that the respondent (patent proprietor) did not contest that features 1g and 2g of independent claims 1 and 2 as granted are directly and unambiguously derivable from claim 6 of document D1/ D1a. Therefore, under discussion remains whether document D1/D1a directly and unambiguously discloses features 1h and 1i of claim 1 and the corresponding features 2h and 2i of claim 2 as granted.

Features 1h and 2h

2.7.1 The appellant (opponent) maintained that, contrary to the assessment of the opposition division, the ratio h2/h1 expressed in feature 1h of claim 1 as granted was directly and unambiguously derivable from document D1/ D1a in combination with feature 1g disclosed in claim 6. It was essentially put forward that a combination of the value of the thickness of the hard coating on the rake face as suggested in claim 5 with a value of the thickness of the hard coating on the flank face as expressed in claim 6 verified condition 1h of claim 1 as granted. Reference was also made to paragraphs [0018] to [0020] and [0034] of D1/D1a and to the combination of claims 1, 4 and 5 and of claims 1 and 6. Finally it was alleged that D1 at least disclosed the

upper and lower end of the range according feature 1h.

2.7.2 The Board does not agree:

It is true that a combination of certain value of h1 and h2 selected from the respective ranges disclosed in D1/D1a leads to a ratio h2/h1 falling within the range required by feature 1h of claim 1 as granted. However, this is not verified for any combination of values but only for specific couple of values. Consequently, as convincingly put forward by the respondent (patent proprietor), a selection of specific values of the thickness of the hard coating on the flank and rake surface among all the possibilities derivable from D1/D1a is required to achieve a ratio within the range required by claim 1. Since D1/D1a does not provide any hint to such a specific selection, it cannot be concluded that feature 1h is directly and unambiguously disclosed in this prior art document. Furthermore, contrary to assertion of the appellant (opponent), document D1/D1a nowhere discloses the lower end of the range recited in claim 1 of the patent as granted, namely h2/h1=0. The same considerations and conclusions apply to feature 2h of claim 2 as granted.

Features 1i and 2i

2.8 The appellant (opponent) held that conditions 1i and 2i were implicitly disclosed for a person skilled in the art reading document D1/D1a in the light of common general knowledge (evidence T1 to T7) for the same reasons presented in respect of document D3.

2.8.1 However, this cannot be followed for the same reasons presented in respect of document D3, taking into account that also in the case of the cutting tool of

D1/D1a the person skilled in the art has no reason to excluded wedge angles ranging for example between 75° and 105° where conditions 1i and 2i are not necessarily verified, and that feature 1h is not directly and unambiguously disclosed in this prior art document.

2.9 Therefore, document D1/D1a fails to disclose features 1h and 1i of claim 1 and the corresponding features 2h and 2i of claim 2 as granted, as correctly found by the opposition division.

Novelty over document D2

2.10 While there is agreement that features 1h and 2h as well features 1i and 2i of claims 1 and 2 as granted are disclosed in D2, the appellant (opponent) contested the findings of the opposition division that document D2 failed to disclose features 1g and 2g of independent claims 1 and 2.

Features 1g and 2g

2.11 The appellant (opponent) acknowledged (see page 11 of the statement of grounds of appeal) that D2 does not disclose features 1g and 2g of claims 1 and 2 as granted because according to the passage in column 4, line 31 of this document the thickness of the hard coating is equal to 7µm instead of 8µm (lower end of the range recited in claims 1 and 2). However, the appellant (opponent) put forward that the difference between the value of the thickness of the hard coating recited in claim 1 and that the suggested in D2, i.e 8µm vs. 7µm, represented a slight constructional change in the dimensioning of the hard coating of the cutting tool of D2 which came within the scope of the customary practice followed by persons skilled in the art. They

concluded that, for this reason, features 1g and 2g had to be considered to be implicitly disclosed in D2.

2.11.1 The Board does not agree because this argument may at the most support an objection lack of inventive step, but is not suitable to support an objection of lack of novelty under Articles 52(1) and 54 EPC.

Features 1f and 2f

2.12 The appellant (opponent) argued that features 1f and 2f of independent claims 1 and 2 as granted included terms as *"tool diameter"*, *"axial direction"* and *"tip of the tool"* which could not be unambiguously identified on the claimed cutting tool. In particular, it was pointed out that the claim did not specify that the *"tip of the tool"* corresponded to its cutting edge. In view of these ambiguities, no clear technical limitation was introduced by features 1f and 2f. For this reason features 1f and 2f had to be disregarded when assessing novelty and inventive step of the subject-matter of the independent claims with respect to the prior art. Furthermore, the appellant (opponent) brought forward that, should the term *"tip of the tool"* be interpreted as meaning a region corresponding to the cutting edge of the tool as it could be derived for example from Figure 5 of the contested patent, the implied limitation could also be found in the cutting tool according to document D2 (see Figures 4 and 5). Finally, the interpretation of the term *"tip of the tool"* as meaning the front end (6) of the cutting tool visible for example in Figures 5 and 6 of D2 suggested by the respondent (patent proprietor) with their reply to the statement of grounds of appeal did not make any technical sense and therefore should be disregarded, with the consequence that the arguments provided by the

opposition division and the respondent (patent proprietor) which were based on this erroneous reading of the technical content of D2 were moot.

2.12.1 The Board does not see any unambiguity in the formulation of features 1f and 2f of independent claims 1 and 2 justifying the allegation of the appellant (opponent) that no limitation was imposed to the claimed cutting tool. In the technical context of claims 1 and 2 the term *"axial direction"* is understood by the person skilled as meaning the longitudinal direction along which the tool extends. The *"diameter of the tool"* is understood as the diameter of the tool measured in cross-section or as the diameter of a circle encircling said cross-section when the latter is not circular. Finally, as assumed by the respondent (patent proprietor), the *"tip of the tool"* represents the distal end of the cutting tool. In the specific embodiment depicted for example in Figure 3 of the patent, the tip of the cutting tool is also located on the cutting edge (3). Furthermore, the Board agrees with the respondent (patent proprietor) that, in the case of the particular geometry of the cutting tool of document D2, the only logic interpretation of the term *"tip of the tool"* is that this region coincides with the distal end (6) shown in the Figures. Since as convincingly argued by the opposition division and the respondent (patent proprietor) D2 discloses grinding off the hard coating in the region of the chip face (7) of the secondary blade (2) and, at most, in the adjacent region (4) of the main blade, the conditions 1f and 2f are not verified because the grinding off of the hard coating does not extend until the tip of the tool, i.e. until the distal end (6), as inherently required by the claims.

2.13 Therefore, document D2 fails to disclose features 1f and 1g of claim 1 and the corresponding features 2f and 2g of claim 2 as granted, as correctly found by the opposition division.

Article 100(a) in combination with Article 56 EPC

3. The ground for opposition pursuant to Article 100(a) in combination with Article 56 EPC is not prejudicial to the maintenance of the patent as granted, as correctly found by the opposition division.

3.1 With their statement of grounds of appeal, the appellant (opponent) contested the conclusion of the opposition division that the subject-matter of independent claims 1 and 2 as granted was not rendered obvious by the cited prior art. The following lines of inventive step attacks submitted before the department of first instance were reiterated with the statement of grounds of appeal:

D1/D1a + D2

3.2 The appellant (opponent) pointed out that D1/D1a and D2 belonged to the same technical field of the contested patent, i.e. design and manufacture of hard-coated cutting tools, and that the objective technical problem to be solved, namely to provide a hard coating cutting tool with a sharp cutting edge allowing chipping reduction, higher cutting performance and longer operational life were common to these prior arts documents and the contested patent. For these reasons, it was argued that the person skilled in the art starting from D1/D1a and looking for a solution to the above mentioned technical problem would definitely consider the teaching of D2 suggesting to grind off the

hard coating on the rake face (h2=0 and hence h2/h1=0) and to adopt a radius (R≤5µm and h1=7 µm) falling within the range of feature 1i of claim 1 as granted. The appellant (opponent) thus concluded that it would be obvious for the person skilled in the art to apply these parameters suggested in D2, namely h2=0 and R≤5µm to the tool disclosed in D1/D1a thereby directly arriving without inventive step to a cutting tool according to claim 1 as granted. The same reasoning and conclusions applied to the subject-matter of independent claim 2 as granted.

3.2.1 These arguments are not convincing:

As stated in section 2.9 above, document D1/D1a fails to disclose features 1h and 1i of independent claim 1 and the corresponding features features 2h and 2i of independent claim 2 as granted. The appellant (opponent) correctly asserted that the hard coating cutting tool of document D2 satisfies the conditions expressed in these distinguishing features. In fact, this prior art document suggests to grind off the coating layer on the rake face, this operation resulting in the thickness of the coating being set to 0. Features 1h and 2h are thus verified. Furthermore, D2 suggests to adopt a R ≤ 5µm and as small as possible (see column 2, lines 1-3). This teaching combined with the suggested thickness of the hard coating on the flank face, i.e. 7µm, results in a radius meeting conditions 1i and 2i of claims 1 and 2 as granted respectively. However, the Board cannot see why the person skilled in the art is motivated to selectively extract only these parameters from document D2 in isolation and introduce them in the cutting tool of document D1/D1a. In this respect, the Board agrees with the opposition division and the respondent (patent

proprietor) that the person skilled in the art is rather taught away from modifying the geometry of the cutting tool of D1/D1a in the way suggested in D2. In fact this document suggests to grind off completely the coating from the rake face (see column 4, lines 38 to 41) while D1/D1a indicates that at least some hard coating must be kept on the rake face (see paragraphs [0018] and [0020]). The appellant (opponent) alleged that document D2 does not imperatively teaches to completely remove the coating from the rake face. However, the Board cannot find any passage in D2 clearly supporting this allegation. Consequently, the Board confirms the view of the opposition division that it is not obvious for a skilled person to fully remove the hard coating on the rake face of the cutting tool according to D1/D1a as suggested by the appellant (opponent).

D2 + D1/D1a and common general knowledge

3.3 The appellant (opponent) put forward that starting from D2 as closest prior art the person skilled in the art would adopt a hard coating thickness on the flank face of this known cutting tool in the range disclosed in claim 6 of D1/D1a, thereby arriving without inventive step to the claimed subject-matter. In the appellant's (opponent's) view, the same modification would be obvious also in view of common general knowledge.

3.3.1 This cannot be followed:

The reasoning of the appellant (opponent) is based on the assumption that the tip of the cutting tool according to D2 coincides with the cutting edge (2,3), whereby features 1f and 2f are also directly and unambiguously disclosed in D2. However, since this

cannot be followed for the reasons stated in section 2.12.1 above, the reasoning of the appellant (opponent) is moot. As convincingly explained by the opposition division and the respondent (patent proprietor), there is no hint in document D2 to partially remove and adjust the thickness of the hard coating on the flank and rake face to meet conditions 1g and 1h in the axial direction (see straight arrows in the figures of D2) till the tip of the tool of D2 which, as previously stated, is represented by the distal end labelled with reference (6) in the figures, and not by the cutting edge (2,3) as assumed by the appellant (opponent) in their reasoning. The same applies to feature 2f of claim 2 as granted.

D3 + D2 and reverse

3.4 The appellant (opponent) argued that starting from D3 as the closest prior art and in order to solve the above mentioned technical problem, it would be obvious to introduce the teaching of D2 in this known cutting tool, thereby arriving to a cutting tool with all the features of independent claims 1 and 2.

3.4.1 No further arguments in support of this inventive step attack were submitted during the oral proceedings. The Board has thus no reasons to deviate from the preliminary conclusions expressed with the communication pursuant to Article 15(1) RPBA dated 3 June 2024 which are herewith confirmed and read as follows:

A possible combination of D3 with D2 does not lead to the subject-matter of claims 1 and 2 at least because neither D2 nor D3 discloses feature 1g. Furthermore this combination is highly questionable because - as

correctly argued by the opposition division and the respondent (patent proprietor) - the complete removal of the coating from the rake face suggested in D2 is in contradiction with the teaching of D3 to only partially remove the coating on the same face (see paragraph [0029]). The appellant (opponent) alleged that document D2 does not imperatively teach to completely remove the coating from the rake face. However, the Board cannot find any passage in D2 clearly supporting this allegation. The line of attack starting from D2 which was nowhere substantiated in the written submissions and it is not convincing for the same reasons presented regarding the combination of D3 with D2.

Further inventive step attacks

4. During the oral proceedings the appellant (opponent) submitted several new lines of inventive step attack. Their admissibility into the appeal proceedings was contested by the respondent (patent proprietor). However, irrespective of the assessment of this admissibility issue, none of these new attacks is convincing:

D3 or D1/D1a in view of common general knowledge

4.1 The appellant (opponent) argued that starting from the cutting tool of D3, the person skilled in the art which always aimed to reduce manufacturing costs and time would obviously consider to reduce the relatively large range suggested in claim 7 of this prior art document for the thickness of the hard coating on the flank face to the narrower range claimed recited in features 1g and 2g of claims 1 and 2 as granted. Furthermore, based on common general knowledge (evidence T1-T7), the skilled reader of D3 implicitly recognized that at

least for specific values of the wedge angle ranging between 45° and 65° which were commonly adopted for cutting tools of the kind disclosed in D3 conditions 1i and 2i were satisfied. The same reasoning applied when starting from D1/D1a with the only difference that the alleged obvious modification concerned the value of the ratio h1/h2 which is not disclosed in this prior art document.

4.1.1 The Board is not convinced:

Firstly, it cannot be seen why the person skilled in the art wishing to reduce the large range suggested in D3 for the value of thickness of the hard coating on the flank face would mandatorily select a value falling in the range 8µm ≤ h1 ≤ 30µm. In fact also any value < 8µm would provide the alleged saving of manufacturing time and costs. Furthermore, as already put forward in section 2.5.2 above, document D3 does not specify the type of cutting tools and hence the wedge angle which applies. In order to inherently and mandatorily obtain a radius meeting conditions 1i and 2i, a further selection of the wedge angle in the range 45° to 65° where these conditions are always satisfied is thus required. In view of the above, the Board considers that the reasoning of the appellant (opponent) goes beyond what the skilled person would have objectively inferred from cited prior art documents without the benefit of hindsight knowledge of the invention. This *"ex post facto"* approach cannot be adopted for correctly assessing inventive step. The same reasons and conclusion applies to the line of attack starting from document D1/D1a.

D3 in view of D1/D1a and reverse

4.2 The appellant argued that starting from D3, it was obvious for the person skilled in the art aiming to improve the sharpness of the cutting tool disclosed therein and to reduce manufacturing time and costs to adopt a value for the thickness of the hard coating on the flank face within the range suggested in claim 6 of D1/D1a. Regarding feature 1i and 2i, it was argued that as explained for the previous lines of inventive step attack, the person skilled in the art would automatically achieve a radius meeting the conditions 1i and 2i of claims 1 and 2 as granted at least for values of the wedge angles between 45° and 65° which are inherent for cutting tools of the kind disclosed in D3. The same reasoning and conclusions applied when starting from D1/D1a.

4.2.1 The Board disagrees:

Firstly, as already discussed in respect of the combination of D1/D1a with D2, it cannot be seen why the person skilled in the art should be motivate to selectively extract the thickness of the hard coating on the flank face from document D1/D1a in isolation from other parameters and introduce it into the cutting tool of document D3. Furthermore, since document D3 does not further specify the type of cutting tool which may thus in principle have a wedge angle between 5° and 95°, a further restriction to wedge angles between 45° and 65° would be required in order to automatically obtain a radius meeting conditions 1i and 2i of claims 1 and 2 as granted. The same applies when starting from document D1/D1a. Therefore, also in this case, the reasoning of the appellant (opponent) suffers from an *"ex post facto"* approach which cannot convincingly

question inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairwoman:

M. Schalow S. Mangin

Decision electronically authenticated