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**Datasheet for the decision
of 13 September 2022**

Case Number: T 0687/20 - 3.2.01

Application Number: 09004045.2

Publication Number: 2106870

IPC: B23C5/20

Language of the proceedings: EN

Title of invention:

Indexable insert with nick

Patent Proprietor:

Sumitomo Electric Hardmetal Corp.

Opponent:

Iscar Ltd.

Headword:

Relevant legal provisions:

EPC Art. 83, 84, 52(1), 54, 56, 123(2)

RPBA 2020 Art. 12(2), 12(6)

Keyword:

Amendments Main Request - allowable (no) - Amendments derivable from the drawings (no)
Sufficiency of disclosure - (yes)
Claims - clarity (yes)
Auxiliary Request unadmissible - no longer maintained in first-instance proceedings (yes)
Late-filed admissibility objection - should have been submitted in first-instance proceedings (yes)
Late-filed evidence - admitted in first-instance proceedings (no) - error in use of discretion at first instance (no)
Inventive step auxiliary request - non-obvious combination of known features

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0687/20 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 13 September 2022

Appellant: Sumitomo Electric Hardmetal Corp.
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Appellant: Iscar Ltd.
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Representative: Stellbrink & Partner Patentanwälte mbB
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted on
7 January 2020 concerning maintenance of the
European Patent No. 2106870 in amended form.

Composition of the Board:

Chairman G. Pricolo
Members: V. Vinci
A. Jimenez

Summary of Facts and Submissions

- I. The appeals filed by the appellant (patent proprietor) and the appellant (opponent) are directed against the interlocutory decision of the opposition to maintain the European patent No. 2 106 870 in amended form.

In its decision the opposition division held that the ground for opposition under Article 100(c) EPC in combination with Article 123(2) EPC was prejudicial to the maintenance of the patent as granted, that the subject-matter of independent claim 1 of the auxiliary requests 1 and 2 did not meet the requirements of Articles 52(1) and 56 EPC and decided to maintain the patent in amended form according to the second version of auxiliary 3 filed as annex 6 at the oral proceedings. Novelty and inventive step were positively assessed, among others, in view of the following prior art:

E1: US-A-4 573 831

E2: US-A-4 140 431

In the course of the opposition proceedings the following prior art documents introduced by the appellant (opponent) were disregarded by the opposition division as late filed:

E7: GB-A-2054 427

E8: US-A-4 531 864

E9: GB-A-1 237 538

E10: EP-A-1 782 902

- II. With the communication according to Article 15(1) RPBA dated 18 June 2021 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 13 September 2022.

- III. The appellant (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained as granted (main request), or alternatively that the patent be maintained according to one of the auxiliary requests 1 to 4 filed with the statement of the grounds of appeal or to the auxiliary requests 5 and 6 filed with the reply to the statement of the grounds of appeal of the appellant (opponent), auxiliary requests 1-6 in appeal corresponding respectively to auxiliary requests 1 and 2, to the first version of auxiliary request 3, to the second version of auxiliary request 3 and to auxiliary requests 4 and 5 as filed during the oral proceedings before the opposition division.

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked. The appellant (opponent) mentioned that the request for reimbursement of the appeal fee in view of an alleged substantial procedural violation was withdrawn.

- IV. Independent claim 1 as granted reads as follows (labelling introduced by the Board):

(a) *"A vertical indexable insert (10) with nicks (8) for a rotary tool, which comprises:*

(b) side surfaces (3) serving as a rake faces;

(c) an upper surface (1) serving as a flank face;

(d) cutting edges provided by a left ridge line (SL) at a position in which a left side surface (3) intersects with the upper surface (1) at a left side of the upper surface and by

(e) a right ridge line (SR) at a position in which a right side surface (3) intersects with the upper surface (1) at a right side; and

(f) a plurality of nicks (8) that divide the left and right ridge lines into a plurality of cutting edge sections,

(g) each nick (8) having an end (Se) in the upper surface (1), each nick (8) having a width (W) gradually increasing toward the end (Se), **characterized in that**

(h) positions of said nicks (8) dividing on the left ridge line (SL) are shifted from positions of nicks (8) dividing on the right ridge line (SR) in a direction so as to provide a step arrangement of cutting edge sections for complementary turning without phases of insert mount positions with respect to a tool body being changed in a tool-axis direction"

Dependent claim 2 as granted reads as follows:

"The vertical indexable insert (10) according to claim 1, wherein the left ridge line (5L) is divided by a different amount of nicks (8) than the right ridge line (5R), in particular the left ridge line (5L) is divided by three nicks (8) and the right ridge line (5R) is divided by four nicks (8)."

Independent claim 1 according to the auxiliary request

1 is based on claim 1 as granted, wherein feature (h) is amended as follows (amendments underlined by the Board):

(h) "positions of said nicks (8) dividing on the left ridge line (5L) in a longitudinal direction are shifted from positions of nicks (8) dividing on the right ridge line (5R) in a longitudinal direction so as to provide a step arrangement of cutting edge sections for complementary turning without phases of insert mount positions with respect to a tool body being changed in a tool axis direction."

Independent claim 1 according to the auxiliary request 2 is based on claim 1 according to the auxiliary request 1 and contains the following additional features:

".. a lower surface (2) having an identical structure to that of the upper surface (1) so that the indexable insert is invertible and usable upside down;" and

".. a mounting hole (7) penetrating through the centers of the upper surface (1) and the lower surface (2);"

Independent claim 1 of the patent as maintained by the opposition division according to the second version of the auxiliary request 3 filed as annexe 6 at the oral proceedings corresponds to claim 1 of the auxiliary request 4 filed in appeal by the appellant (patent proprietor) and reads as follows (labelling introduced by the Board):

(a) "A vertical indexable insert (10) with nicks (8) for a rotary tool, which comprises:

(b) *side surfaces (3) serving as a rake faces;*

(c) *an upper surface (1) serving as a flank face;*

(d) *a lower surface (2) having an identical structure to that of the upper surface (1) so that the indexable insert is invertible and usable upside down;*

(e) *cutting edges provided by a left ridge line (5L) at a position in which a left side surface (3) intersects with the upper surface (1) at a left side of the upper surface and by*

(f) *a right ridge line (5R) at a position in which a right side surface (3) intersects with the upper surface (1) at a right side; and*

(g) *a plurality of nicks (8) that divide the left and right ridge lines into a plurality of cutting edge sections,*

(h) *each nick (8) having an end (8e) in the upper surface (1), each nick (8) having a width (W) gradually increasing toward the end (8e),*

(i) *a mounting hole (7) penetrating through the centers of the upper surface (1) and the lower surface (2);*

characterized in that

(j) *the side surfaces (3) are concavely curved, and the ridge lines (5L, 5R) are inwardly curved, and*

(k) *positions of said nicks (8) dividing on the left ridge line (5L) in a longitudinal direction are shifted from positions of nicks (8) dividing on the right ridge*

line (5R) in a longitudinal direction so as to provide a step arrangement of cutting edge sections for complementary turning without phases of insert mount positions with respect to a tool body being changed in a tool-axis direction."

Independent claim 6 of the patent as maintained by the opposition division corresponds to claim 6 of the auxiliary request 4 filed in appeal by the appellant (patent proprietor) and reads as follows:

"A face milling cutter (20) comprising a tool body (21), a plurality of chip pockets (23), a plurality of insert bases (22) and indexable inserts (10) according to one of the claims 1 to 5 which are received in the insert bases (22), wherein the inserts (10) which use the left ridge line (5L) as a cutting edge and the inserts (10) which use the right ridge line (5R) as a cutting edge are alternately mounted on the insert bases (22).

wherein the inserts are mounted such that the left ridge line (5L) cuts a cut region of a workpiece in a divided manner and the right ridge line (5R) cuts the remaining cut region of the workpiece which is not cut by the left ridge line."

Reasons for the Decision

APPEAL OF THE PATENT PROPRIETOR

Main Request: Patent as granted

Amendments: Article 123(2) EPC

1. The main request does not meet the requirements of Article 123(2) EPC as correctly stated by the opposition division in the decision under appeal.
- 1.1 The appellant (patent proprietor) contested the view of the opposition division that the feature of dependent claim 2 as granted reading:

"the left ridge line (5L) is divided by a different amount of nicks (8) than the right ridge line (5R) "

was based on an unallowable intermediate generalisation of the embodiment in figures 1 and 2 of the originally filed application which, as such, infringed Article 123(2) EPC. By referring to paragraph [0025] of the originally filed application it was essentially argued that a complementary cutting process, as the one addressed by the contested patent, inherently implied shifting of the positions of the nicks on one ridge line of the cutting insert with respect to their positions on the other ridge line. In the appellant's (patent proprietor's) view, the presence of a shift did not only directly and unambiguously imply for the person skilled in the art that the number of nicks on the right and left ridge lines had to be different, but also, as a mandatory condition, that this number had to differ by only 1 nick, as directly and unambiguously

derivable from the embodiment in figures 1 and 2 of the originally filed application. Therefore, the appellant (patent proprietor) concluded that the broad interpretation of claim 2 proposed by the opposition division and the appellant (opponent) on which the reasoning and the conclusions of the opposition division under Article 123(2) EPC were based and according to which the claimed number of nicks on the left and right ridge lines of the insert may differ by more than one nick, does not make technically sense for a person skilled in the art who would thus read the claim as meaning that the number on nicks on the left and right ridge line differed only by one as directly and unambiguously disclosed in figures 1 and 2.

- 1.2 The arguments submitted by the appellant (patent proprietor) are not convincing for the following reasons:

It is uncontested that the formulation of the mandatory feature expressed in claim 2 and presented above is not wordily supported by the application as filed. From the specific embodiment shown in figures 1 and 2 a person skilled in the art can at the most derive the specific teaching consisting of providing 3 nicks on the left ridge line and 4 nicks on the right ridge line. However, as correctly argued by the opposition division and the (appellant) opponent, the contested wording of claim 2 as granted indisputably covers any combinations implying a different number of nicks on the right and left ridge lines including, for example and unlike the embodiment in figures 1 and 2, any combination which differs by one nick or more than one nick, thus covering any combination showing, unlike figures 1 and 2, more nicks on the left ridge line than on the right ridge line. All these possibilities covered by claim 2

are not explicitly disclosed in the application as filed. Furthermore, the assertion of the appellant (patent proprietor) that a person skilled in the art would implicitly infer from the technical context of the application, i.e. cutting inserts for complementary cutting, and on the basis of common general knowledge that a configuration suitable for complementary cutting mandatorily requires that the number of nicks on the right and left two ridge line differs only by one nick and no more, and therefore that the subject-matter defined by the contested wording of claim 2 can only be interpreted in this way, has not been substantiated by any evidence, as stressed by the appellant (opponent) and is thus not convincing. In this respect the Board notes that as not all the cutting edge portions provided on the ridge line of a cutting insert must be necessarily used during a complementary cutting operation, a configuration implying a number of nicks on the right and left ridge line differing by two or more nicks cannot be technically ruled out. Therefore, the subject-matter of claim 2 as granted is broader than the information presented in the originally filed application and in particular in the context of the specific embodiment shown in figures 1 and 2 which are indicated by the appellant (patent proprietor) as the only basis for the amendment in claim 2. This circumstance results in an unallowable intermediate generalisation infringing Article 123(2) EPC as correctly stated by the opposition division in the contested decision.

1.3 The main request is thus not allowable.

Auxiliary Requests 1 and 2

2. The auxiliary requests 1 and 2 filed with the statement of grounds of appeal of the appellant (patent proprietor) correspond to the auxiliary requests 1 and 2 underlying the decision under appeal.

Inventive Step: Articles 52(1) and 56 EPC

- 2.1 The subject-matter of independent claim 1 of these auxiliary requests does not involve an inventive step in the meaning of Articles 52(1) and 56 EPC as correctly concluded by the opposition division in the decision under appeal.

Auxiliary Request 1

- 2.2 It is uncontested that the subject-matter of claim 1 of this auxiliary request differs from the teaching of E1, which is considered by all the parties as the closest prior art, in the claimed shifted positioning of the nicks dividing the right and left ridge lines (see feature (h) as amended).
- 2.3 The appellant (patent proprietor) contested the conclusion of the opposition division that the subject-matter of claim 1 of the auxiliary request 1 was rendered obvious by document E1 in view of the teaching of document E2. In support of this view it was pointed out that starting from E1 as closest prior art, the only technical problem underlying the contested patent which can be inferred from the above mentioned distinguishing feature could only be seen in providing a more versatile vertical indexable nicked cutting insert for complementary cutting. The appellant (patent proprietor) explained that the cutting insert of E1 was

conceived for being vertically mounted on the toolholder of a rotary cutting tool used in heavy cutting operations, while the cutting insert disclosed in E2 - unlike the cutting insert disclosed in E1 and in the contested patent - was conceived for being horizontally mounted on the toolholder of a different kind of rotary cutting tool used under very different cutting conditions and in any case unsuitable for heavy cutting operations. The appellant (patent proprietor) asserted that due to these clear structural and operational differences reflected in the different mounting (vertical vs. horizontal) and the geometry/dimensioning (large flank surface vs. narrow flank surface) of the cutting inserts at stake, the person skilled in the art, contrary to the view of the opposition division, was not motivated to consider the teaching of E2 when trying to implement the cutting insert of E1. It was also observed that a replacement of the cutting insert of E1 with that of E2 did not directly lead to a cutting insert according to claim 1 of the auxiliary request 1 because feature (g) of claim 1 was not fulfilled by the insert of E2. The appellant (patent proprietor) further asserted that, contrary to the view of the opposition division and the appellant (opponent), the person skilled in the art had no motivation to isolate the specific teaching disclosed in E2, i.e. the provision of staggered cutting edges portions on the opposite ridge lines of the horizontal cutting insert described therein, and to apply it to the vertical cutting insert of document E1 without modifying any other feature of the latter. In this respect it was argued that the person skilled in the art would have realized that the staggered arrangement of the nicks suggested in E2 was merely imposed by the presence of a very narrow flank surface not allowing for a non-staggered arrangement as the one proposed in

E1. The appellant (patent proprietor) thus concluded that the person skilled in the art, even by considering E2, could not find in this prior art document any hint that the suggested staggered arrangement of the cutting edge portions, if applied to the insert of E1, could have improved the versatility of the resulting cutting insert, thereby solving the technical problem addressed by the contested patent.

- 2.4 The arguments submitted by the appellant (patent proprietor) in support of inventive step of the subject-matter of claim 1 of the auxiliary request 1 are not convincing for the following reasons:

The Board concurs with the opposition division and with the appellant (opponent) that the person skilled in the art under consideration is an expert in the technical field of milling processes, milling tools and cutting inserts therefor, including cutting inserts for complementary cutting. Contrary to the appellant's (patent proprietor's) view, such an expert, starting from E1 and aiming at an implementation of this known cutting insert for complementary cutting in the sense of achieving a higher versatility in use, would definitely consider document E2 because, regardless of the different mounting orientation on the toolholder compared to the orientation adopted in E1, this prior art also deals with an indexable cutting insert for milling cutters (see column 1, lines 1-3) suitable for complementary cutting (see column 1, lines 48-62). In this regard the Board shares the view of the appellant (opponent) that document E1 already points to the possible alternative of using staggered cutting edge portions instead of the proposed aligned cutting edge portions (see E1, column 1, lines 67-68). Furthermore, as correctly noted by the appellant (opponent), the

cutting insert of E2 is also perfectly suitable for heavy cutting applications (see E2, column 1, lines 4-5) as the insert of E1 or according to the contested patent. Therefore the Board, in accordance with the view of the opposition division, does not see any reason why the person skilled in the art would disregard the teaching of E2, as asserted by the appellant (patent proprietor), when trying to implement the cutting insert of E1.

2.5 The Board is also convinced that the person skilled in the art, when considering the design of the insert of E2, would immediately realize that the staggered positioning of the nicks achieves higher versatility in the sense that a special toolholder as the one required for mounting the insert of E1, i.e. a toolholder having insert pockets located thereon with an axial offset (see figure 3 of E1), is no longer necessary and that a standard toolholder having pockets circumferentially aligned (see figure 1 of E2) can be used instead to perform complementary cutting.

2.6 Therefore the Board concurs with the opposition division and with the appellant (opponent) that the person skilled in the art starting from E1 and aiming at an alternative and more versatile solution, i.e. a cutting insert for complementary cutting which does not require a special toolholder, would definitely consider to apply the staggered arrangement of the cutting edge sections suggested in E2 (see figures 4 to 6) to the insert disclosed in E1, thereby arriving without inventive step to the subject-matter of claim 1 of the auxiliary request 1.

2.7 The appellant (patent proprietor) objected to the isolation of a single feature from the cutting insert

of E2, i.e. the staggered arrangement. However, the Board, in agreement with the opposition division, cannot see any reason why the person skilled in the art would be prevented from isolating and applying only the staggered arrangement of the nicks of the cutting insert of E2 to the cutting insert disclosed in E1 without modifying any other structural feature thereof. In fact, the disclosed staggered arrangement does not depend on and is neither functionally and inextricably interrelated to other structural features of the insert of E2 (for example the reduced dimension of the flank face cited by the appellant (patent proprietor)). The staggered arrangement is also not linked to any particular type of milling cutter or cutting operation or to the adopted mounting orientation of the inserts on the toolholder (the insert of E2 is indeed also suitable for vertical mounting). Therefore, an isolation of the staggered arrangement from the cutting insert of E2 does not require any inventive consideration. Finally, the Board observes that the reasons and the conclusion of the opposition division do not presuppose the idea of entirely replacing the geometry of the cutting insert of E1 by those of E2, what was objected to by the appellant (patent proprietor) with the reason that such a replacement would require further and non obvious modifications to fulfill the subject-matter of claim 1, but the application of the pure concept of the staggered arrangement of the nicks proposed in E2 to the insert of E1 as it is. Therefore the opposition division is correct in concluding that the subject-matter of claim 1 of the auxiliary request 1 is rendered obvious by E1 and E2 in combination.

Auxiliary Request 2

- 2.8 The Board concurs with the opposition division that the additional features introduced in claim 1 of the auxiliary request 2 are also provided in the cutting insert of E1. Although this was not contested, the appellant (patent proprietor) explained in their written submissions that the proposed amendments served to even more clearly characterize the insert according to the contested patent as a vertical indexable insert thereby further differentiating it from the horizontal cutting insert of E2. In the appellant's (patent proprietor's) view the amendments introduced further supported the assertion that a combination of E1 with E2 will not be contemplated at all by a person skilled in the art. The Board notes that no further arguments were proposed at the oral proceedings in respect of this auxiliary request.
- 2.9 However, as explained regarding the auxiliary request 1, the alleged structural/operational differences between the cutting inserts of E1 and E2 do not prevent the person skilled in the art from considering the staggered arrangement of the nicks of the insert of E2 as suitable for solving the technical problem underlying the contested patent and hence from applying it to the insert of E1 irrespective of the presence of other distinguishing but not interrelated structural features.
- 2.10 The auxiliary request 1 and 2 are thus also not allowable.

Auxiliary Request 3

Admissibility

3. The auxiliary request 3 filed with the statement of grounds of appeal of the appellant (patent proprietor) corresponds to the first version of the amended auxiliary request 3 filed at the opposition oral proceedings as annex 3. The admissibility of this auxiliary requested is objected by the appellant (opponent) under Article 12(6) RPBA with the argument that this request was withdrawn in the course of the first instance oral proceedings. The appellant (patent proprietor) replied that the request at stake was not explicitly withdrawn as demonstrated by the fact that it was negatively assessed by the opposition division under Article 123(2) EPC in the minutes (see page 9, second paragraph). Even in the event that the Board was inclined to consider that the request was withdrawn at the oral proceedings, the appellant (patent proprietor) considered that its reintroduction was justified by the objection raised by the appellant (opponent) against the admissibility of auxiliary request 4 filed in appeal.
- 3.1 The Board considers that the minutes states on page 9, 4th paragraph onwards, that the first version of the auxiliary request 3 previously filed as annex 3 was replaced in the course of the oral proceedings (together with the first version of the auxiliary requests 4 and 5) by a second version of the auxiliary request 3 filed as annex 6. Replacing a previously filed request by a new version results "*de facto*" in the withdrawal of the previous one, whereby the Board follows the view of the appellant (opponent) that the first version of the auxiliary request 3 was not

maintained in the first instance proceedings. The statement of the opposition division in the minutes mentioned by the appellant (patent proprietor) expresses a mere preliminary opinion regarding compliance with Article 123(2) EPC of the first version of the auxiliary request 3 to which the appellant (patent proprietor) reacted by replacing this request by a new one in an attempt to overcome the potential issue indicated by the opposition division. By replacing the first version of the auxiliary request 3 the appellant (patent proprietor) "*de facto*" deprived the first instance department to rule thereon, as is confirmed by the circumstance that the contested decision does not deal with this request. The circumstance invoked by the appellant (patent proprietor) that the appellant (opponent) with their statement of grounds of appeal objected to the admissibility of auxiliary request 4 (corresponding to the second version of the auxiliary request 3 filed as annex 6 at the oral proceedings on which basis the patent was maintained) cannot justify the reintroduction of the first version of auxiliary request 3 into the appeal proceedings. In this respect the Board first notes that the first version of auxiliary request 3 was reintroduced in appeal with the statement of grounds of the appellant (patent proprietor) and not in response to any objection by the appellant (opponent). The Board also considers that the appellant (patent proprietor) took the decision to replace the first version of the auxiliary request 3 at the first instance oral proceedings before any discussion on admissibility and/or allowability of the second version of the auxiliary request 3 took place. In order to face a possible dismissal of the second version of the auxiliary request 3 by the opposition division, the appellant (patent proprietor) could and

should have, as a precautionary measure, maintained the first version of the auxiliary request 3 instead of withdrawing it in front of the first instance and then requesting the reintroduction of this previously abandoned version in appeal by invoking precautionary reasons.

- 3.2 In view of the above the Board decided not to admit the auxiliary request 3 into the appeal proceedings under Article 12(6) RPBA, second sentence.
- 3.3 As for the reasons given above neither the main request nor the auxiliary requests 1 and 2 are allowable and in view of the fact that the auxiliary request 3 is not admissible, the appeal of the patent proprietor is to be dismissed.

APPEAL OF THE OPPONENT: Patent as Maintained

Auxiliary request 4

4. This request corresponds to the second version of the auxiliary request 3 filed at the first instance oral proceedings as annex 6 and considered allowable by the opposition division. This request is the object of the appeal of the appellant (opponent) which is dealt with below.
5. The appellant (opponent) contested the decision of the opposition to maintain the patent in amended form according to the auxiliary request 3, second version submitted at the first instance oral proceedings.

Admissibility

6. The appellant (opponent) objected to the decision of the opposition division to admit the second version of the auxiliary request 3 with the reason that it was late filed at the oral proceedings and comprised not only unsearched matter taken from the description, but also features derived from the figures. The appellant (opponent) also criticized the behaviour of the opposition division that allegedly applied an excessive and unjustified amount of discretion towards the patent proprietor as demonstrated by the fact that document E10 submitted by the appellant (opponent) as reaction to the admittance of the late filed second version of the auxiliary request 3 was not admitted.
- 6.1 The Board, in agreement with the appellant (patent proprietor) observes that the admissibility of the second version of the auxiliary request 3 was not objected by the appellant (opponent) before the first instance department as proven by the relevant passages of the minutes of the oral proceedings (see page 9, 4th paragraph onwards) which have never been contested. Both the minutes and the decision are silent regarding any objection of the appellant (opponent) to the admittance of this request. It is uncontestable that the appellant (opponent) should and could have objected to the admittance of the auxiliary request 3, second version upon its submission at the oral proceedings if it was of the opinion that the amendments introduced at such a late stage of the discussion would have negatively affected its position in the opposition proceedings. However, the opponent failed to do so. Therefore, the objection of the appellant (opponent) against the admittance of auxiliary request 4, corresponding to the second version of the auxiliary

request 3 in opposition is not admitted into the appeal proceedings under Article 12(6) RPBA 2020. Furthermore, as stressed by the appellant (patent proprietor), the decision under appeal is based on said second version of the auxiliary request 3 which is thus part of the appeal proceedings (Article 12(2) RPBA 2020).

Article 123(2) EPC

7. The patent as maintained by the opposition division fulfils the requirements of Article 123(2) EPC.

7.1 The appellant (opponent) objected to the compliance with Article 123(2) EPC of the following features of claim 1 of the auxiliary request 3, second version.

Feature (j): *"the side surfaces are concavely curved, and the ridge lines are inwardly curved"*

7.2 It is uncontested that there is no literal support in the application as originally filed for the above features. In fact paragraph [0023], lines 9-12 only states that the side surfaces and the ridge lines are curved. The appellant (opponent) objected that the only basis for the contested amendment indicated by the appellant (patent proprietor) and by the opposition division was the specific embodiment shown in figure 1 from which, in their view, the features that the side surfaces and the ridges lines are respectively "concavely curved" and "inwardly curved" could not be directly and unambiguously derived, thereby infringing Article 123(2) EPC. Furthermore, it was alleged that the amendment under discussion resulted in any case in an unallowable intermediate generalisation of this specific embodiment also infringing Article 123(2) EPC. It was essentially argued that the broader expression

"*concavely curved*" introduced in claim 1 was silent regarding the intended direction of the concavity of the side surface of the claimed insert, whereby this broad definition could not be supported by the specific embodiment in figure 1. The appellant (opponent) also observed that figures 1 and 4 in combination suggested that each side surface was embodied as a twisted side surface and that the angle of view of figure 1 did not allow to directly and unambiguously derive whether a continuous concave curvature was provided. In the appellant's (opponent's) view this had the consequence that the person skilled in the art could not exclude, only on the basis of the information provided by figures 1 and 4, that the side surfaces according to this specific embodiment consisted of concave-convex or mixed curvature regions that, as such, did not fall within the broader meaning of the expression "*concavely curved*" side surfaces. Concrete examples of these allegedly undisclosed possibilities were sketched on the flip chart and discussed at the appeal oral proceedings. Furthermore, even in the event that the contested features "*concavely curved*" and "*inwardly curved*" could be directly and unambiguously derived as such from figure 1, they were isolated from this specific embodiment of the cutting insert which comprised further features which were omitted in claim 1, this also resulting in an unallowable intermediate generalisation infringing Article 123(2) EPC.

- 7.3 The arguments of the appellant (opponent) are not convincing for the following reasons:

The appellant (patent proprietor) correctly observed that paragraph [0023], lines 9-12 of the originally filed application wordily discloses that the side

surfaces and the ridge lines are curved. The point under discussion is thus whether the application as originally filed directly and unambiguously discloses "concavely curved" side surfaces and "inwardly curved" ridge lines as now recited in feature (j). From the feature stated in claim 1 that the right and left inwardly curved ridge lines are located at a position in which the right and left side surfaces intersect with the upper surface at the right and left side of the upper surface, the person skilled in the art derives that each side surface at its intersection with the respective upper surface must be concave in the sense that it follows the inward curvature of the ridge lines. That said, the Board concurs with the assessment of the opposition division that a person skilled in the art, in view of the representation offered by figure 1, would directly and unambiguously realize that the whole side surface is shaped accordingly, i.e. as a concavely curved and inwardly shaped surface. The uncontested fact resulting from figures 1 and 4 that the side surfaces are twisted, as objected by the appellant (opponent), is fully geometrically compatible with such a shape. Regarding the objection of the appellant (opponent) that from the point of view of figure 1 it cannot be excluded that the side surfaces, between the ridge lines, present concave-convex or mixed curvature portions, the Board concurs with the appellant (patent proprietor) that although this may be theoretically possible, the person skilled in the art, in view of the fact that the side surfaces are functionally rake surfaces which - as it is well known - must vary smoothly in order to reduce the cutting resistance, would exclude a mixed concave-convex shape which cannot fulfil such design requirement. Finally, the Board concurs with the appellant (patent proprietor) that the structural features of the embodiment in figure 1

omitted in claim 1 as maintained are not functionally and inextricably interrelated with the essential features of the cutting insert according to the contested patent, namely the staggered arrangement of the cutting edge portions and the concavely and inwardly curved shape of the side surfaces and of the ridge lines respectively, and as such can thus be omitted without infringing Article 123(2) EPC.

7.4 Regarding the further features objected under Article 123(2) EPC by the appellant (opponent) with their written submissions, no further arguments were presented at the oral proceedings, whereby the Board has no reason to deviate from its preliminary conclusions which are hereby confirmed and read as follows:

7.5 The appellant (opponent) argued that there was no basis in the originally filed application for the wording of feature (k) reading *"to provide a step arrangement of cutting edge sections"*. In addition, it was alleged that the feature (k) as a whole was based on an unallowable intermediate generalisation of the disclosed preferred embodiment indicated as basis for this amendment in claim 1 as granted.

7.6 The Board does not agree and follows the conclusion of the opposition division:

Paragraph [0025] of the originally filed application wordily states that *"Accordingly, a step arrangement of cutting edges is provided"*. Furthermore, as correctly pointed out by the appellant (patent proprietor), claim 1 as filed contains the wording *"a plurality of nicks that divide the cutting edge into a plurality of sections"*. Therefrom, the person skilled

in the art directly and unambiguously derives that at the end a step arrangement of cutting edge sections is provided on the left and right ridge lines according to the wording of feature (k) and as further supported by figures 1 and 2. The same applies to the contested feature *"in a longitudinal direction"* which is interpreted as longitudinal direction of the cutting edge and is supported by paragraphs [0024] and [0025] of the originally filed application in combination with figures 1 and 2. Regarding the alleged intermediate generalisation, the Board shares the view of the opposition division and of the appellant (patent proprietor) that the person skilled in the art would recognize that the features which have been omitted in claim 1 (see point 5.2 of the statement of the grounds of appeal of the appellant (opponent)) are not functionally and inextricably linked to the step arrangement of the cutting edge sections as now defined in feature (k), this step arrangement being the only essential features required to solve the technical problem addressed by the contested patent. Therefore, the omission of these features in claim 1 as maintained does not result in an intermediate generalisation infringing Article 123(2) EPC.

- 7.7 The same conclusions apply with the same arguments to claim 6 which is directed to a face milling cutter comprising indexable inserts according to claim 1. The Board concurs with the opposition division and with the appellant (patent proprietor) that none of the features disclosed in paragraphs [0028] to [0030] of the originally filed application in the context of the claimed milling cutter and omitted in claim 6 as maintained can be considered to be functionally and inextricably linked to the features introduced in claim 6. Therefore, also in this case, no unallowable

intermediate generalisation arises.

Article 83 EPC

8. The patent as maintained by the opposition division fulfils the requirements of Article 83 EPC.

8.1 The appellant (opponent) argued that feature (j) reading *"the side surfaces are concavely curved, and the ridge lines are inwardly curved"* was presented by the appellant (patent proprietor) as being suitable, in combination with a positive rake angle, for achieving reduction of cutting forces, and this was presented as a decisive technical effect provided by the cutting insert according to the contested patent. However, in the appellant's (opponent's) view, the contested patent, contrary to the requirements of Rule 42 (1) c) EPC, did not provide the person skilled in the art with sufficient information as to how concavely curved side surfaces contributed to the claimed reduction of the cutting forces, thereby rendering impossible to carry out the invention in such a way to achieve the claimed technical effects. The appellant (opponent) further pointed out that an inwardly curved ridge line did not always result in operation in a positive rake angle and hence in reduced cutting forces because this advantageous setting also depended on the actual mounting orientation of the insert into the insert pocket of the toolholder. An inconsistency between figures 1 and 2 was also alleged which in the appellant's (opponent's) view prevented the person skilled in the art from carrying out the invention without undue burden. The appellant (opponent) concluded that the invention could not be successfully enabled over the whole scope of the claim and was thus

insufficiently disclosed.

8.2 These arguments are not convincing:

The Board concurs with the patent proprietor that claim 1 is directed to a cutting insert "per se" and therefore the question at stake is whether the person skilled in the art would be able to manufacture a cutting insert as defined in claim 1. The Board is convinced that the person skilled in the art, by referring to the figures, would experience no difficulties in manufacturing a cutting insert with side surfaces and ridge lines respectively concavely and inwardly curved according to feature (j). As correctly stated by the appellant (patent proprietor), the question of whether any kind of technical effect is achieved by the proposed cutting insert geometry eventually impacts on the assessment of inventive step rather than on the assessment of compliance with Article 83 EPC. In any case, it can be reasonably expected that a person skilled in the art will be able to mount the insert in the pocket of the toolholder in the correct orientation enabling in operation a positive rake angle and thus the desired reduction of cutting forces and the consequent smooth cutting results.

8.3 Regarding the further issues raised by the appellant (opponent) under Article 83 EPC in their written submissions, no further arguments were presented at the oral proceedings, whereby the Board has no reason to deviate from its preliminary conclusions which are hereby confirmed and read as follows:

"a plurality of cutting edge sections"

8.4 The appellant (opponent) merely alleged that this feature is neither supported by nor further detailed in the opposed patent, and therefore not sufficiently disclosed in the meaning of Article 83 EPC, without however convincingly substantiating this allegation. The Board does not thus see any reason for deviating from the reasoning and conclusion of the opposition division. As correctly put forward by the appellant (patent proprietor), it is clear from the features (d) and (e) that each cutting edge is formed by the respective ridge line, and from feature (g) that each cutting edge is divided by successive nicks into a plurality of cutting edges sections. The person skilled in the art, also in view of the embodiment shown in figures 1 and 2 of the contested patent, would not experience any difficulty when trying to realize a plurality of cutting edges sections on the ridge lines.

"positioning/dividing .. said nicks in a longitudinal direction"

8.5 The appellant (opponent) argued that due to the ambiguity of the expression of *"longitudinal direction"*, the shifted arrangement of the nicks according to feature (k) of claim 1 could not be realized by the person skilled in the art without undue burden.

9. The Board disagrees and concurs with the opposition division and with the appellant (patent proprietor) that the person skilled in the art constructing the claim with a mind willing to understand and supported by the embodiment in figures 1 and 2, would have no doubt that the longitudinal direction is a direction along the cutting edge sections and will thus be able to manufacture the insert accordingly without any

burden. The arguments submitted by the appellant (opponent) in support of their allegation appear to be directed to an alleged lack of clarity under Article 84 EPC rather than to an issue under Article 83 EPC.

Article 84 EPC

10. The patent as maintained by the opposition division fulfils the requirements of Article 84 EPC.
- 10.1 The opponent objected that the expressions "*concavely curved*", "*inwardly curved*" and "*longitudinal direction*" are vague and unclear, in particular regarding the intended direction of the curvature.
- 10.2 However, the Board concurs with the opposition division and with the appellant (patent proprietor) that every person skilled in the art knows the general meaning of the expression "*concavely curved*", and therefore, when constructing the claim with a mind willing to understand, the intended limitation would be clear even without relying on a reference system or on the drawings, i.e. a concavity directed towards the center of the upper surface and lower surface. Regarding the expression "*inwardly curved*", the Board has no doubt, as pointed out by the appellant (patent proprietor), that in the case of a physical object extending in 3 dimensions, as the cutting insert at stake, this expression has to be understood as meaning curved towards the interior the insert. The same applies to the term "*longitudinal direction*" that in context of the claim clearly indicates a direction extending along the ridge lines/cutting edge of the cutting insert. Furthermore, all these interpretations of the contested expressions above are fully supported by the

description and the figures.

10.3 At the oral proceedings the appellant (opponent) objected to an alleged inconsistency between the representation in figure 1 and the cross-section X-X presented in figure 4 and argued that this inconsistency also resulted in a lack of clarity affecting the claimed subject-matter. Furthermore it was argued that the fact that a negative rake angle was not excluded in claim 1 also implied an inconsistency with the possibility of achieving the claimed technical effect also leading to a lack of clarity.

10.4 The Board disagrees:

Firstly the Board cannot detect any major inconsistency between figures 1 and 4. Secondly the Board, in accordance with the appellant (patent proprietor), cannot see how an eventual mismatch between these figures, which have anyway a schematic character, could be detrimental to clarity of the subject-matter of claim 1. Regarding the exclusion of a rake negative angle, the Board observes that in operation the resulting rake angle depends on the mounting orientation of the cutting insert on the toolholder. However, claim 1 is directed to cutting insert "*per se*", whereby an indication of the rake angle would not make any technical sense in the context of the claim. Furthermore, no passage of the description presents the use of a positive rake angle as an essential feature of the contested patent which rather focuses on the staggered arrangement of the cutting edge portions on the respective ridge line.

Inventive Step: Articles 52(1) and 56 EPC

E1 in view of E2 and common general knowledge

11. The subject-matter of claim 1 and 6 of the patent as maintained by the opposition involves an inventive step in the meaning of Articles 52(1) and 56 EPC.
- 11.1 The opponent (appellant) essentially argued that starting from E1 as closest prior art, the uncontested distinguished features (j) and (k) identified by the opposition division solved two unrelated technical problems, namely to provide a positive rake angle which as it is well known reduces cutting forces (feature (j)) and to provide a more versatile cutting insert suitable for complementary cutting operations (feature (k)). It follows that these technical features cannot be considered functionally and inextricably interrelated they should thus have been evaluated separately when assessing inventive step. It was further pointed out that an inventive contribution of feature (k) in itself was denied by the opposition division in view of the teaching of E2 in the context of the assessment of inventive step of the auxiliary requests 1 and 2 and that this view was confirmed by the Board both in its preliminary opinion and in the course of the oral proceedings. The appellant (opponent) also asserted that the use of concavely curved side surfaces with inwardly curved ridge lines allowing for a positive rake angle and thus for a reduction of the cutting forces involved represented a measure falling within customary practice followed by a person skilled in the art. Therefore it was concluded that the idea of replacing the flat side surfaces and the straight ridge lines of the cutting insert resulting from the combination of E1 and E2 by

concavely curved side surface and inwardly curved ridge lines to improve the smoothness of a cutting process could not involve an inventive step in view of common general knowledge. The appellant (opponent) supported this conclusion by stressing that no synergistic effect between features (j) and (k) or achieved unexpected technical effect was presented in the contested patent or demonstrated by the appellant (patent proprietor), whereby the introduction of curved cutting edges in the cutting insert resulting from the obvious combination of E1 and E2 represented an arbitrary choice deprived of any inventive contribution.

11.2 The Board is not convinced and shares the arguments of the opposition division and the appellant (patent proprietor) for the following reasons:

11.3 The Board concurs with the appellant (patent proprietor) that the fact that both the distinguishing features (j) and (k) significantly determine the geometry of the cutting edge, which is in turn decisive for the performance of the cutting process, leads to conclude that both features are somehow functionally interrelated in such a way to contribute to the cutting results. Therefore the opposition division is correct in assessing these distinguishing features in combination when deciding inventive step. The Board concurs with the appellant (opponent) that the teaching of providing a cutting insert with concavely curved side/rake faces and inwardly curved cutting edges with the purpose to determine in operation a positive rake angle and hence to reduce cutting forces is well known in the state of the art. However, the Board follows the view of the opposition division and of the appellant (patent proprietor) that the claimed step of interrupting a continuous and curved cutting edge by

providing nicks according to feature (k) is not immediately evident. The Board observes that the cutting edge of a cutting insert is a very sensitive region in respect of the cutting results, whereby any even minor modification to its geometry might substantially impact on the cutting performances thereon and therefore must be considered carefully. The Board, in agreement with the opposition division and with the appellant (patent proprietor), cannot find in the cited state of the art any clear hint that interrupting a continuous curved cutting edge according to features (k) would lead to even better cutting results rather than the contrary. Therefore, in the Board's view, regardless of whether a decisive improvement is achieved by the solution of claim 1 in terms of smoothness of the cut by providing curved and discontinuous cutting edge portions, the Board does not consider obvious to introduce in the already complex geometry of the cutting edges resulting from the combination of E1 and E2 a further modification consisting in curved cutting edge portions.

- 11.4 The same conclusions apply with the same arguments to the subject-matter of claim 6 which is directed to a face milling cutter comprising the cutting inserts of claim 1.

Admissibility of document E10

12. Document E10 was filed during the opposition oral proceedings upon submission of the second version of the auxiliary request 3 by the appellant (patent proprietor). The appellant (opponent) contested the discretionary decision of the opposition division not to admit this evidence. It was argued that E10 was filed in reaction to the late submission of the second

version of the auxiliary request 3 at the oral proceeding which was based on features extracted from the description and drawings.

12.1 The appellant (patent proprietor) replied that the opposition division took its discretionary decision on the basis of the correct principle of the "*prima facie*" relevance. It was also observed that this document, in the appellant's (opponent's) intention had the purpose to show that curved cutting edges were well known in the relevant prior art, what was not contested anyway. Furthermore "curved side surfaces" and "curved ridge lines" were already claimed in claim 1 of the auxiliary request 3 filed 2 month before the date of the oral proceedings.

12.2 The Board recalls that a decision on the admissibility of a late filed evidence is taken by the first instance in exercise of its own discretion as provided by Article 114(2) EPC and that, according to established Case Law of the Boards of Appeal, the review of this decision by the Board should be generally restricted to the question whether the first instance has exercised its discretion properly and according to the correct criteria. As the opposition division applied the correct criterion of the "*prima facie*" relevance this is the case here. Therefore the Board does not see any reason for superseding the discretionary decision of the opposition division and to admit document E10 in the appeal proceedings. Regarding the criticism expressed by the appellant (opponent) regarding the behaviour of the opposition division that allegedly applied an excessive and unjustified amount of discretion towards the patent proprietor when it decided to admit the second version of the auxiliary request 3 but rejected at the same time document E10,

the Board considers this argument moot because as explained under point 6.1 above, the admittance of the second version of auxiliary request 3 was not objected to by the appellant (opponent) in front of the first instance.

Documents E7 to E9

13. With their written submissions the appellant (opponent) reiterated the request to admit the late filed documents E7 to E9 which according to the preliminary opinion issued by the opposition division in preparation for oral proceedings were not considered "prima facie" relevant. No further arguments were submitted in this respect at the oral proceedings.
- 13.1 The Board observes that no lines of inventive step attack using these documents were submitted in appeal and therefore does not see any need to decide on the admissibility of these documents.

Order

For these reasons it is decided that:

The appeals are dismissed.

The Registrar:

The Chairman:



A. Voyé

G. Pricolo

Decision electronically authenticated