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**Datasheet for the decision
of 5 October 2006**

Case Number: T 0839/05 - 3.2.06

Application Number: 99953078.5

Publication Number: 1123173

IPC: B23C 5/22

Language of the proceedings: EN

Title of invention:

Anti-rotation mounting mechanism for round cutting insert

Patentee:

KENNAMETAL INC.

Opponent:

Sandvik AB

Headword:

-

Relevant legal provisions:

EPC Art. 54(2), 56, 84, 111(1), 112(1)(a)

Keyword:

"Novelty (no) - main and auxiliary requests II, VI"
"Remittal (no)"
"Inventive step (no) - auxiliary request III, V"
"Late filed request (inadmissible) - auxiliary request IV"
"Referral of a question to the Enlarged Board of appeal (no)"
"Clarity (yes) - auxiliary request VII"
"Inventive step (yes) - auxiliary request VII"

Decisions cited:

T 0133/87, T 0557/94, T 0092/93, T 0367/96

Catchword:

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Case Number: T 0839/05 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 5 October 2006

Appellant: Sandvik AB
(Opponent) S-81 181 Sandviken (SE)

Representative: Stein, Jan Anders Lennart
Groth & Co. KB
P.O. Box 6107
S-102 32 Stockholm (SE)

Respondent: KENNAMETAL INC.
(Patent Proprietor) 1600 Technology Way
Latrobe, PA 15650-0231 (US)

Representative: Sties, Jochen
Prinz & Partner, GbR
Rundfunkplatz 2
D-80335 München (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 16 June 2005
rejecting the opposition filed against European
patent No. 1123173 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: W. Sekretaruk
Members: G. Pricolo
M. Harrison

Summary of Facts and Submissions

I. The appeal is from the decision of the Opposition Division posted on 16 June 2005 rejecting the opposition filed against European patent No. 1 123 173, granted in respect of European patent application No. 99 953 078.5.

The independent claims 1 and 10 of the patent as granted read as follows:

"1. An anti-rotation mounting mechanism between an indexable insert (3) and an insert-receiving pocket (5) in a tool body (7), said insert including an upper surface (13) that terminates in a cutting edge (15), a lower surface (11), and a circular side surface (21) between said upper and lower surfaces, comprising: a plurality of stop surfaces (35) disposed around said insert side surface (21), a portion of which is obliquely oriented with respect to said side surface of said insert; and at least one anti-rotation surface (36) in said pocket (5) of said tool body for engaging said obliquely oriented portion of said curved stop surfaces (35) forming an interference joint, characterized in that said stop surfaces (35) are curved and both said surfaces (35) and anti-rotation surface (36) are substantially defined by a partial radius curve, such that said stop surfaces (35) and said anti-rotation surface (36) engage in at least line contact in forming said interference joint."

"10. An anti-rotation mounting mechanism between an indexable insert (3) and an insert-receiving pocket (5) in a tool body (7), said insert including an upper

surface (13) that terminates in a rounded cutting edge (15), a lower surface (17), and a side surface (21) between said upper and lower surfaces, comprising: a plurality of stop surfaces (35) disposed around said insert side surface (21), a portion of which is obliquely oriented with respect to said side surface (21) of said insert; and at least one anti-rotation surface (36) in a sidewall (50) of said pocket of said tool body (7) for engaging said obliquely oriented portion of said stop surfaces (35) and forming an interference joint, characterized in that said stop surfaces (35) are curved and said anti-rotation surface (36) being substantially complementary to said curve of said stop surfaces (35), and engaging said stop surface (35) in at least line contact, wherein said rounded stop surfaces (35) are concave and said anti-rotation surface (36) is convex, and said stop surface (35) and anti-rotation surface (36) are substantially defined by a partial-radius curve."

II. The Opposition Division came to the conclusion that the grounds of opposition under Article 100(a) EPC did not prejudice the maintenance of the European patent as granted. In coming to this conclusion, the Opposition Division considered that the most relevant prior art was represented by a milling tool of the company Walter AG made available to the public by use. The indexable insert and the insert-receiving pocket surface in accordance with the prior use, generally referred to as D1, were particularly shown in the technical drawings:

D1e: Drawing entitled "Plattensitz", type "P2200-2-C", dated 12 June 1995; and

D1f: Drawing entitled "Wendeplatte", type "P2200-2", dated 24 May 1991.

The claims of the patent in suit required a *theoretical* line contact between the stop surfaces and the anti-rotation surface. Since in the prior used arrangement the theoretical contact between the corresponding surfaces was punctual, the claimed subject-matter was novel. It also involved an inventive step because the prior art, including documents:

D3: DE-A-4244316;

D4: WO-A-97/00750;

did not disclose or suggest the concept of "*a line contact in combination with a partial radius curve of the stop surfaces acting together*", which led to a reduction of local stresses in either the body of the insert or the pocket of the tool holder that received the insert.

III. On 30 June 2005 the appellant (opponent) lodged an appeal against this decision. The payment of the appeal fee was registered on the same day. The statement setting out the grounds of appeal was received at the EPO on 21 October 2005.

IV. In an annex to the summons for oral proceedings pursuant to Article 11(1) Rules of Procedure of the Boards of Appeal the Board expressed the preliminary

opinion that the view of the Opposition Division according to which the claims of the patent in suit implied a *theoretical* contact, could not be followed and that the claims should be understood as referring to the contact which occurred in practice, since in the embodiments of the patent in suit no theoretical line contact was disclosed, only point contact.

V. With its letter of 25 September 2006 in response to the communication of the Board, the respondent filed first to eighth auxiliary requests for maintenance of the patent in amended form. The respondent submitted that it could not agree with the opinion of the Board as stated in the communication, because it was based on the disclosure of Figure 5 of the patent in suit which was incorrect and in clear contradiction with the remainder of the disclosure. In fact, the anti-rotation surface 36 and the stop surface 35 were not inclined relative to each other, as shown in Figure 5, but extended parallel to one another.

VI. Oral proceedings took place on 5 October 2006.

The appellant requested that the decision under appeal be set aside and that the patent be revoked. It further requested the referral to the Enlarged Board of Appeal of the following question:

"According to Art 102(3), a patent can be maintained in amended form during opposition proceedings.

Furthermore, the amended claims must meet the requirements of the EPC. EPO practice of today allows a combination of an independent claim with a granted subclaim, without check whether the combination fulfils

the requirements of Art 84. In the present appeal case T 839/05-3206, some subclaims are unclear and are not supported by the description, causing that the Board has to interpret the new claim based on an independent claim and such an unclear subclaim (see Auxiliary request 7).

Can it be justified not to allow examination under Article 84 of requests containing a combination of granted subclaims, in particular with regard to the fact that in some technical areas, there is an "overflow" of subclaims, being impossible for the Examiner in the Examining Division to examine all subclaims?"

The respondent (patentee) requested that the appeal be dismissed as a main request or that the patent be maintained on the basis of auxiliary requests II or III, filed 25 September 2006, or on the basis of auxiliary request IV, filed 5 October 2006, or on the basis of auxiliary requests V or VI filed 25 September 2006 as auxiliary requests IV and V or on the basis of the text of auxiliary request VII, filed 5 October 2006 together with Figures 1 to 7 as granted.

VII. Claim 1 according to auxiliary request II differs from claim 1 as granted in that it includes, in the characterizing portion, the following additional feature:

"said anti-rotation surface (36) is substantially complementary to said curve of said stop surfaces (35)".

Claim 1 according to auxiliary request III differs from claim 1 as granted by the addition of the following feature at the end of the characterizing portion:

"wherein said anti-rotation surface (36) is an integral part of a lower side surface (52) of said pocket".

Claim 1 according to auxiliary request IV differs from claim 1 as granted by the addition of the following feature at the end of the characterizing portion:

"resulting in broad line or lenticular contact".

Claim 1 according to auxiliary request V (corresponding to auxiliary requests IV filed with letter dated 25 September 2005) differs from claim 1 as granted by the addition of the following feature at the end of the characterizing portion:

"wherein said anti-rotation mounting mechanism comprises at least two anti-rotation surfaces (36) spaced apart in said insert-receiving pocket (5) for engaging two different stop surfaces (35) of said insert (3)".

Claim 1 according to auxiliary request VI (corresponding to auxiliary request V filed with letter dated 25 September 2005) differs from claim 1 as granted by the addition of the following feature at the end of the characterizing portion:

"a line (C1, C2) drawn tangent to portions of engagement between said stop surface (35) and said anti-rotation surface (36) traversing the outer circumference of the insert at an angle which is non-orthogonal to the outer circumference of the insert".

Claims 1 and 9 according to auxiliary request VII include the wording of claims 1 and 10 respectively as granted, with the expression "characterized in that" replaced by "wherein", and additionally including the following wording:

"characterized in that said side surface (21) of said insert includes a sinusoidal profile that defines said stop surfaces (35)."

VIII. The arguments of the appellant, in as far as they are relevant to this decision, can be summarized as follows:

Claim 1 of the patent in suit required the stop surfaces and the anti-rotation surface to engage in at least line contact. This wording could only be understood as referring to the contact which occurred in practice because there was no disclosure in the patent in suit of how to achieve a theoretical line contact. D1 related to a milling tool in which an indexable insert was mounted in an insert-receiving pocket. Rotation of the insert in use was prevented by means of a cylindrical pin, provided in the insert-receiving pocket, which engaged a corresponding recess in the insert. The pin and the recess thus provided the surfaces corresponding, respectively, to the stop surface and anti-rotation surface recited in the claims. Due to the relative inclination between the walls of the pin and of the recess, the contact occurred, in theory, at a point. In practice, however, due to the different hardness of the insert and the tool body, the contact was along a line. Accordingly, D1 was prejudicial to the novelty of the subject-matter of claim 1 of the patent as granted.

In the present case, remittal to the first instance was not justified if the main request were not allowed due to lack of novelty. Remittal would unduly lengthen the proceedings, in particular having regard to the fact that oral proceedings had taken place already twice before the Opposition Division.

Also, the subject-matter of claim 1 of auxiliary request II lacked novelty over the prior used arrangement. It was true that, as shown in D1e and D1f, the surface of the recess and the cylindrical surface of the pin were relatively inclined with respect to each other. However, the amount of inclination was minor and the two surfaces could be regarded as being substantially, i.e. with a certain degree of approximation, complementary.

In the arrangement of D1, the pin could not be removed from the tool body, since it was press fitted in a hole. Accordingly, it was an integral part of a lower side surface of the pocket. Therefore, the subject-matter of claim 1 according to auxiliary request III lacked novelty. In any case, forming the pin integrally with the tool body was an obvious modification of the arrangement of D1, in particular having regard to the disclosure in D3 and D4 of stop surfaces constructed integrally with the insert-receiving pocket of the tool body.

Auxiliary request IV was to be rejected as inadmissible because the claims of this request, which was filed late during the oral proceedings, included unclear features taken from the description.

D1 disclosed an insert having a plurality of stop surfaces. The skilled person would regard it as obvious to provide at least two anti-rotation surfaces in the arrangement of D1, i.e. at least two pins. This was an obvious design possibility, suggested by D3 and D4, for reducing the forces acting on the single pin of D1. Therefore, the subject-matter of claim 1 according to auxiliary request V lacked an inventive step.

Claim 1 according to auxiliary request VI included features taken from the description which were not clear and therefore the claim did not meet the requirements of Article 84 EPC.

It could not be understood what was meant by "*a sinusoidal profile that defines the stop surfaces*" in claim 1 according to auxiliary request VII. Moreover, there was no support in the description for such a profile. Although claim 1 combined the features of granted claims 1 and 6, it should be possible to object to it under Article 84 EPC, even if this was contrary to recent EPO practice. This was a legal issue that needed to be definitively resolved, and for this reason the question filed in writing during the oral proceedings should be referred to the Enlarged Board of Appeal. In any event, although the profile of the stop surfaces as seen in the side surface of the insert according to D1 was defined by portions of straight lines, it was very similar to a sinusoidal line. The skilled person would obviously consider smoothing the sharp transitions at the intersections of the straight lines in order to avoid localized stresses which could crack the insert body, thereby arriving in an obvious manner at the claimed mechanism.

IX. During the oral proceedings the respondent withdrew its previous argument according to which Fig. 5 of the patent in suit was incorrect, and submitted that the stop surfaces and the anti-rotation surface extended in parallel on those portions where they contacted each other, thereby creating a line contact, but, due to the sinusoidal tapered shape of the stop surfaces, were inclined relative to each other in the remaining portions. Accordingly, since Fig. 5 represented a cross-sectional view taken at a distance from the line of contact, the stop surface and the anti-rotation surface were correctly represented as being inclined to one another. There could be no doubt that the patent in suit implied the line contact which occurred in theory, as a result of the geometry of the stop surfaces and the anti-rotation surface. In fact, a clear distinction was made in the patent in suit between the definition in the claims and the result in practice which, as explained in the description, was either a broad line-type or a lenticular-surface type contact. Since in D1 the contact between the cylindrical pin in the insert-receiving pocket and the recess in the insert type was, in theory, a point contact, the claimed subject-matter was novel over the prior used arrangement. Furthermore, in D1 it was the edge of the pin that contacted the stop surface of the insert. Since an edge was not a surface, D1 did not disclose that it was a stop surface that engaged the anti-rotation surface.

The respondent requested that the case be remitted to the Opposition Division if the main request were not allowed due to lack of novelty, in order not to be

deprived, in respect of the auxiliary requests, of an examination of inventive step by two instances.

The respondent's arguments in respect of the auxiliary requests can be summarized as follows:

The subject-matter of claim 1 of auxiliary request II was novel over D1 because in the known arrangement the surface of the recess was inclined relative to the cylindrical surface of the pin. Accordingly, in D1 the anti-rotation surface was not substantially complementary to the stop surface.

Since in D1 the pin was a separate component fitted in a hole in the pocket of the tool body, D1 did not disclose the feature of claim 1 of auxiliary request III according to which the anti-rotation surface was an integral part of a lower side surface of said pocket. This feature, which provided for a more accurate positioning of the insert in the pocket, was also not suggested by the prior art.

Auxiliary request IV was filed during the oral proceedings in response to the Board's objection that the claims referred to the contact which occurred in practice. Accordingly, auxiliary request IV was filed in due time. By defining that the contact was of a broad line or lenticular type, claim 1 clearly set out the shape of the contact which occurred in practice.

In the mechanism of D1 there was a single pin forming an anti-rotation surface. D1 therefore did not disclose the provision of at least two anti-rotation surfaces as required by claim 1 according to auxiliary request V.

This distinguishing feature resulted in the cutting insert having an increased resistance to rotation. D3 did not disclose a plurality of pins acting as anti-rotation surfaces. D4 related to an arrangement of a different kind than that of D1, because the insert of D3 was provided with planar rather than curved stop surfaces. Accordingly, the subject-matter of claim 1 according to auxiliary request V was not rendered obvious by a combination of D1 with either D3 or D4.

In the arrangement of D1, a line drawn tangent to portions of engagement between the recess of the insert and the pin of the tool body was orthogonal to the outer circumference of the insert, and therefore the subject-matter of claim 1 according to auxiliary request VI was novel over D1.

The skilled person giving the term "profile" its ordinary meaning would have no difficulties in understanding the definition in claim 1 according to auxiliary request VII. Since the description referred to a continuous sinusoidal curve around the circumference of the sidewall of the insert, claim 1 was supported by the description. There was no indication in the prior art suggesting the provision of stop surfaces having a sinusoidal profile for reducing localized stresses and thus avoiding cracks of the insert in use.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request - patent as granted*

2.1 The state of the art in accordance with Article 54(2) EPC comprises the arrangement, generally referred to as D1, of a tool body as shown in document D1e (Plattensitz P2200-2-C) in combination with an insert as shown in document D1f (Wendeplatte P 22215-2), which was made available to the public by undisputed prior use.

2.2 Using the wording of claim 1 of the patent in suit, this arrangement comprises an anti-rotation mounting mechanism between an indexable insert and an insert-receiving pocket in a tool body, said insert including (see D1f) an upper surface that terminates in a cutting edge, a lower surface, and a circular side surface between said upper and lower surfaces, comprising: a plurality of stop surfaces disposed around said insert side surface, a portion of which is obliquely oriented with respect to said side surface of said insert (see D1f, lowest drawing); at least one anti-rotation *means* (see the pin designated "Zylinderstift" in D1e) in said pocket of said tool body for engaging said obliquely oriented portion of said curved stop surfaces forming an interference joint; wherein said stop surfaces are curved and both said surfaces and anti-rotation *means* are substantially defined by a partial radius curve.

In the known arrangement, each stop surface is provided by a recess defined by a portion of a circle (see the front view of the insert in D1f) and the anti-rotation *means* is provided by a cylindrical pin (see D1e) which has a radius slightly smaller than that of the recess.

It is undisputed that, since it is an edge of the pin that contacts the recess, the contact between the pin and the recess occurs, in theory, at a point, and that in practice, due to the unavoidable deformation of the materials, the contact occurs along a line extending along the edge of the pin.

The appellant submitted that since an edge was not a surface, D1 did not disclose that it was a stop surface that engaged the anti-rotation surface. However, an edge created by the intersection of two surfaces is, by definition, a line common to both surfaces.

Accordingly, the edge of the pin is part of the cylindrical surface of the pin, and therefore the above mentioned anti-rotation *means* can effectively be regarded as an anti-rotation surface.

2.3 It follows from the above that the novelty of the subject-matter of claim 1 depends on whether the claim refers to the contact which occurs in theory or that which occurs in practice.

2.4 The patent in suit discloses that the curved stop surfaces and anti-rotation surfaces are "*relatively gently sloping*" (see col. 5, last three lines). Figs. 4 and 5 clearly and unambiguously disclose that these surfaces have different inclinations. The theoretical contact between such round surfaces having different inclinations as shown in Fig. 4 to 6 can, however, only be a point, not a line.

The appellant submitted that Figures 4 and 5 represented cross-sectional views taken at a distance

from where the contact between the stop surface and the anti-rotation surface occurred, and that at that location, these surfaces were parallel. This interpretation is neither corroborated by geometrical explanations nor finds any support in the description. In fact, either the curved surfaces are parallel along their entire extension, but then there would be no different inclinations in the cross-sectional views of Figs. 4 and 5, or at least one of them has a varying inclination such that parallelism is given at the contact location only. However, there is no indication in the disclosure of the patent in suit taken as a whole to support the latter specific construction of surfaces. Moreover, the statement in the description (col. 5, lines 50 to 56) according to which "*oblique contact refers to the fact that a line C_1 , C_2 drawn tangent to the engagement portions 37a, 58a traverses the outer circumference of the circular insert 15 at an angle which is non-orthogonal to the outer circumference of the circular insert 3*" rather suggests that the line contact does not occur in a substantially vertical direction (as seen in the view of Fig. 4) but rather along the horizontal oblique lines C_1 and C_2 , as shown in Fig. 6. However, even in the horizontal plane of Fig. 6 there is no theoretical line contact, since the curved lines representing the profile of the curved surfaces 35 and 36 can in theory only contact each other at a point (although in practice they are in contact along a line). Finally, the fact that appellant itself provided two different interpretations of Fig. 5, is an indication that the geometrical representation of Fig. 5 has a certain degree of ambiguity.

The appellant further submitted that a clear distinction was made in the patent in suit between the definition in the claims, stating that there was line contact, and the result in practice, which was described as a broad line or lenticular contact. However, the claims refer to "at least line contact" and the description does not mention a "line contact" but only discloses a "broad line or lenticular contact" (column 3, lines 4, 5 and 24, 25; column 6, lines 1,2). The latter type of contact falls under the generic definition of "at least line contact" and is, undisputedly, the type of contact that occurs in practice in the embodiments described in the patent in suit. Therefore, there is no basis in the patent in suit to conclude that the terminology in the claims refers to the theoretical contact whilst that of the description to the contact that occurs in practice.

It follows that the patent in suit does not clearly and unambiguously disclose a theoretical line contact, but only a line contact as the contact which occurs in practice.

Furthermore, by reciting that the stop surfaces and the anti-rotation surface "*engage in at least line contact in forming said interference joint*", claim 1 of the patent in suit (and analogously independent claim 10 as well) refers to the situation in which the surfaces are engaged and the interference joint is formed, hence to a situation in which each surface applies a force to the other. In an anti-rotation mounting mechanism of the kind claimed, the different situation in which an interference joint, in the sense of a positive locking of one surface respect to the other, exists without any

application of a force is rather hypothetical and certainly not maintained in use when external forces act on the insert. Accordingly, claim 1 taken alone can only be seen as relating to a situation which occurs in practice, not in theory.

- 2.5 It follows from the above that the information in the patent in suit only allows claim 1 to be understood as referring to the contact which occurs in practice. Since, as explained above, in D1 such contact is "at least along a line", the subject-matter of claim 1 lacks novelty and therefore the main request of the respondent cannot be allowed due to lack of novelty (Art. 54(2) EPC).

3. *The auxiliary requests*

The non-allowance of the main request implies that the decision of the Opposition Division according to which the claimed subject-matter was both novel and inventive must be set aside and the auxiliary requests taken into consideration.

The amendments according to the auxiliary requests consist principally in the inclusion, in the independent granted claims, of additional features which are different for each auxiliary request. This means that, assuming that novelty is present, the assessment of inventive step must be made on a substantially different basis for each auxiliary request.

It has been acknowledged in the jurisprudence of the Boards of Appeal that there is no absolute right of a

party to have every aspect of a case examined in two instances (see e.g. T 133/87, point 2. of the reasons), even if as a consequence the patent is revoked for the first time by the Board of Appeal (see e.g. T 557/94, point 1.3 of the reasons). Other criteria, e.g. the general interest that proceedings are brought to a close within an appropriate period of time, have also to be taken into account by the Board when deciding whether or not to remit a case. In the present case, since the amendments are of a different nature for each auxiliary request, a possible consequence of remittal could be further remittals on subsequent appeal proceedings, which would unduly lengthen the proceedings. Thus, with due consideration made for procedural economy and to avoid further delay, the Board decides not to remit the case but to decide on it itself in accordance with Article 111(1) EPC.

4. *Auxiliary request II*

4.1 Claim 1 of auxiliary request II includes all the features of granted claim 1 and, additionally, the feature of granted claim 6 according to which "*said anti-rotation surface is substantially complementary to said curve of said stop surfaces*".

4.2 As explained above (point 2.2), in the prior used arrangement each stop surface is provided by a recess defined by a portion of a circle and the anti-rotation surface is provided by a cylindrical pin which has a radius (2 mm: see the indication "Ø4" for the diameter of the pin in D1e) slightly smaller than that of the recess (the radius of the recess is about 2.1 mm, see the indication R2,1 in D1f, whereby the difference

between the radiuses is 0.1 mm). When comparing D1e and D1f, it is clear that the surface of the recess which contacts the pin is inclined at an angle of 7° with respect to the cylindrical surface of the pin. Accordingly, the surface of the recess and the cylindrical surface of the pin are not identical, and thus not perfectly complementary. However, the expression "*substantially complementary*" in claim 1 can only be regarded as requiring that the two surfaces are approximately complementary, since as shown in Fig. 6, they have different inclinations (see also point 2.3 above). Since the relevant surfaces of the pin and the recess in D1 only differ by a very small amount in radius and inclination, they are approximately complementary.

It follows that D1 discloses, in combination, all the features of claim 1 according to auxiliary request II.

4.3 Therefore, auxiliary request II is not allowable due to lack of novelty (Article 54(2) EPC).

5. *Auxiliary request III*

5.1 Claim 1 of auxiliary request III includes all the features of granted claim 1 and, additionally, the feature of granted claim 2 according to which "*said anti-rotation surface is an integral part of a lower side surface of said pocket*".

5.2 In D1, as is evident from D1e, the anti-rotation surface provided by the pin is *integrated* in a lower side surface of the insert-receiving pocket. However, since the pin is provided as a separate component, it

is not an *integral part* of a lower side surface of the pocket, whereby the expression "integral part" can only be understood in the context of the patent in suit (see e.g. Fig. 2A) as meaning that the anti-rotation surface is structurally formed as a unit with the pocket.

Therefore, the added feature confers novelty to the subject-matter of claim 1 with respect to the arrangement in D1.

- 5.3 The respondent submitted that the provision of the anti-rotation surface as an integral part of a lower side surface of said pocket allowed a more accurate positioning of the insert in the insert-receiving pocket. However, there is no disclosed basis in the patent in suit to support this alleged effect. Nor can it be said that, generally, better dimensional precision is achieved by integrally forming a curved surface in a tool body than by providing said curved surface as a separate part. Therefore, in the absence of any recognizable further technical effect, the distinguishing feature can only be regarded as an alternative construction of the anti-rotation surface.

The skilled person faced with the technical problem of finding an alternative construction to the press-fitted pin of D1 would obviously consider forming the pin as an integral part of the insert-receiving pocket. Indeed the design alternative of forming a pin element as an integral part of a base surface is known to the skilled person from common general knowledge and this also finds specific application in the present technical field, as shown by D3. In Fig. 3 of D3 the pin 13, which forms the anti-rotation surface of the tool body

for engaging a stop surface 19 of the insert, is represented as an integral part of the tool body 10.

Therefore, the skilled person would arrive at the subject-matter of claim 1 without exercising any inventive skill.

5.4 As a consequence, auxiliary request III is not allowable due to lack of inventive step (Article 56 EPC).

6. *Auxiliary request IV*

The claims according to auxiliary request IV were filed during the oral proceedings, after the discussion of the main request and auxiliary requests I to III. The appellant's submission that auxiliary request IV was filed in response to the Board's view that the claims of the patent in suit referred to the contact which occurred in practice does not justify the late filing, because this view was already set out in the communication accompanying the summons to oral proceedings and, therefore, the amendment could have been filed in advance of the oral proceedings.

Claim 1 of auxiliary request IV includes all the features of granted claim 1 and, additionally, the feature according to which the engagement between the stop surfaces and the anti-rotation surfaces is such that it results in "broad line or lenticular contact". The introduction of this feature, which is taken from the description of the patent in suit, is *prima facie* objectionable under Article 84 EPC in view of the presence of the vague terms "broad" and "lenticular".

Accordingly, since auxiliary request IV is considered late-filed and claim 1 is not clearly allowable, this request is rejected as inadmissible (see e.g. T 92/93, Reasons, point B.1).

7. *Auxiliary request V*

7.1 Claim 1 of auxiliary request V includes all the features of granted claim 1 and, additionally, the features of granted claim 9 according to which "*said anti-rotation mounting mechanism comprises at least two anti-rotation surfaces spaced apart in said insert-receiving pocket for engaging two different stop surfaces of said insert*".

The arrangement of D1 undisputedly comprises one pin and therefore, a single anti-rotation surface.

Thus, the added features confer novelty to the subject-matter of claim 1 with respect to the arrangement in D1.

7.2 The distinguishing features have the effect of reducing the forces between the anti-rotation surface in the insert-receiving pocket and its corresponding stop surface in the insert, and therefore solve the problem of improving the insert's resistance to rotation.

The skilled person faced with the problem of improving the insert's resistance to rotation in the arrangement of D1 would look for a more effective manner of securing the insert in the insert-receiving pocket. The insert of D1 is provided with a plurality of recesses,

i.e. of stop surfaces, around its circumference. D4 already discloses effectively preventing rotation of an insert by means of two surface portions (13b) of the insert abutting corresponding walls (37) in the insert-receiving pocket (a lower portion 37 is shown in Fig. 3; the presence of two such portions is clearly derivable from the right-hand portion of Fig. 6 which shows an insert-receiving pocket without the insert, and from the disclosure on page 6, line 3, that "at least one shoulder 33 has a lower portion 37). In other words, D4 discloses actively using more than one of the stop surfaces provided in the insert for preventing its rotation. Therefore, the skilled person would recognise that a manner of solving the above-mentioned technical problem is to actively use more than one of the recesses provided in the insert of D1. This requires the provision of at least a second pin in the arrangement of D1 such that the first and second pins engage two recesses of the insert, a modification that does not present any difficulty for the skilled person. In doing this, the skilled person would arrive at the subject-matter of claim 1 without exercising any inventive skill.

7.3 As a consequence, auxiliary request V is not allowable due to lack of inventive step (Article 56 EPC).

8. *Auxiliary request VI*

8.1 Claim 1 of auxiliary request VI includes all the features of granted claim 1 and, additionally, a feature taken from the description of the patent in suit (see par. [0014]), according to which "a line drawn tangent to portions of engagement between said

stop surface and said anti-rotation surface traversing the outer circumference of the insert at an angle which is non-orthogonal to the outer circumference of the insert".

8.2 The questions of whether this amendment meets the requirements of Article 123(2) or 84 EPC can be left aside, because it is immediately evident that the added feature does not establish novelty over D1. As explained by the Board during the oral proceedings, since the recesses of the circular insert of D1 are defined by portions of circles which centres lie outside the outer circumference of the insert, any line drawn tangent to a recess, i.e. to a stop surface, traverses the outer circumference of the insert at an angle which is non-orthogonal to the outer circumference of the insert.

8.3 Therefore, auxiliary request VI is not allowable due to lack of novelty (Article 54(2) EPC).

9. *Auxiliary request VII*

9.1 Independent claims 1 and 9 of auxiliary request VII combine the features of claims 1 and 6 and claims 10 and 14 respectively of the patent as granted, and find their basis in claims 1, 2 and 7 and claims 11, 12 and 16 respectively of the application as filed.

Dependent claims 2 to 8 and 10 to 13 correspond to granted claims 2 to 5, 7 to 9, 11, 13, 15 and 16, respectively.

The description is amended to be in conformity with the new claims, and to acknowledge the prior art according to D1. Furthermore, the expression "few thousandths of an inch (mm)" in col. 5 is replaced by "few thousandths of an inch (1 inch equals 25.4 millimeters)" to overcome an objection under Article 123(2) EPC (under Article 100(c) in the notice of opposition) raised by the appellant. The Figures are the same as those of the patent as granted.

Accordingly, the amendments do not give rise to objections under Article 123(2) and (3) EPC.

- 9.2 The appellant submitted that the feature of claims 1 and 9 according to which "said side surface of said insert includes a sinusoidal profile that defines said stop surfaces" was not clear and not supported by the description.

It is a fact that the wording of claims 1 and 9 was already present as such in the granted claims, and that case law exists (see e.g. T 367/96) according to which objections based upon Article 84 EPC against a claim resulting in substance from the combination of claims of the patent as granted should not be allowed. In the present case, however, the question of whether an objection under Article 84 is admissible against claims 1 and 9, which forms the basis for the appellant's request of referring a question to the Enlarged Board of Appeal, can be left aside, because it is readily apparent that the appellant's objections are unfounded. In fact, giving the term "profile" its ordinary meaning (i.e. outline or contour), it is clear that the above-mentioned feature can only refer to the sinusoidal

curve that forms the boundary or edge of the stop surface on the side surface of the insert. This reading is fully supported by the description, which discloses (see col. 5, lines 3 to 8) that the side edges of the stop surfaces create a continuous sinusoidal curve around the circumference of the sidewall of the insert (see also Fig. 3).

It follows from the above that, for the purposes of the present decision, there is no necessity to refer the appellant's question to the Enlarged Board of Appeal in application of Article 112(1)(a) EPC.

9.3 In the insert according to D1 (see D1f), the profile of the stop surfaces in the side surface of the insert is essentially defined by straight lines. Therefore, D1 does not disclose the feature of claims 1 and 9 according to which the side surface of said insert includes a sinusoidal profile that defines said stop surfaces. Since this feature is not disclosed by the other available prior art documents either, the subject-matter of the independent claims is novel.

9.4 Compared to the arrangement of D1, which is the closest prior art for both the mechanism of claim 1 and that of claim 9, the distinguishing features provide a smooth continuous profile in which there are no sharp transitions which could concentrate stresses in use and thus possibly generate cracks in the insert.

Therefore, the problem solved can be regarded as improving the insert's resistance to cracks.

Although it is generally known that stresses might concentrate where sharp transitions are present, there is no indication in the available prior art which would lead the skilled person to consider that the sharp transitions in the profile of the recesses (i.e. the stop surfaces) play a significant role in the generation of cracks in the insert, and therefore, that precisely those sharp transitions should be removed. In any event, even if the skilled person would consider removing the sharp transitions, there is no indication suggesting doing this by modifying the straight lines in the profile so as to provide a sinusoid. In fact, the skilled person, having regard to his general knowledge, would rather consider simply replacing the sharp transitions with curved portions. Therefore, the subject-matter of independent claims 1 and 9 is not suggested by the available prior art. It thus involves an inventive step (Articles 52(1), 56 EPC).

- 9.5 It follows that claims 1 and 9, together with dependent claims 2 to 8 and 10 to 13, the amended description filed at the oral proceedings, and the drawings as granted, form a suitable basis for maintenance of the patent in amended form.

Order

For these reasons it is decided that:

1. The request for referral of a question to the Enlarged Board of Appeal is rejected.
2. The decision under appeal is set aside.
3. The case is remitted to the first instance with the order to maintain the European patent on the basis of the following documents according to auxiliary request VII:

claims: 1 to 13 as filed during the oral proceedings of 5 October 2006;

description: columns 1 to 6 and insert page as filed during the oral proceedings of 5 October 2006;

drawings: Figures 1 to 7 as granted.

The Registrar:

The Chairman:

M. Patin

W. Sekretaruk