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**Datasheet for the decision
of 2 February 2010**

Case Number: T 1150/08 - 3.2.06

Application Number: 03704971.5

Publication Number: 1476266

IPC: B23B 27/08

Language of the proceedings: EN

Title of invention:

Metal cutting tool

Patentee:

Iscar Ltd.

Opponent:

Sandvik Intellectual Property AB

Headword:

-

Relevant legal provisions:

EPC Art. 123(2), 84, 56

Relevant legal provisions (EPC 1973):

-

Keyword:

"Amendments - intermediate generalisation (no)"

"Clarity (yes)"

"Inventive step - main request (no), auxiliary request (yes)"

Decisions cited:

T 0301/87, T 0201/83, T 0714/00

Catchword:

-



Case Number: T 1150/08 - 3.2.06

D E C I S I O N
of the Technical Board of Appeal 3.2.06
of 2 February 2010

Appellant: Sandvik Intellectual Property AB
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
15 May 2008 concerning maintenance of European
patent No. 1476266 in amended form.

Composition of the Board:

Chairman: P. Alting Van Geusau
Members: G. Pricolo
R. Menapace

Summary of Facts and Submissions

- I. The appeal lies against the interlocutory decision of the Opposition Division posted on 15 May 2008 maintaining European patent No. 1 476 266 in amended form on the basis of the patent proprietor's first auxiliary request.
- II. The Opposition Division came to the conclusion that the European patent as amended did not contain subject-matter extending beyond the content of the application as filed, and that the claimed subject-matter involved an inventive step over the cited prior art, including:

D1 : WO-A-98/01249;

D5 : DE-A-69 117 544;

D6 : EP-A-0 232 692.

In coming to its decision, the Opposition Division disregarded the documents D9a to D9d filed by the opponent during the oral proceedings in support of the alleged public prior use of a tool having the denomination Arno® Clip-Groove.

- III. The patentee and the opponent each lodged an appeal against this decision. The notices of appeal were received at the EPO on 20 June and 11 July 2008, respectively, and the appeal fees were duly paid. The statements setting out the grounds of appeal were received at the EPO on 25 and 15 September 2009, respectively.

With its statement of grounds of appeal, the appellant (opponent) requested that the patent be revoked and the reimbursement of the appeal fee on the basis that there had been procedural violations. It moreover filed documents D9e to D9g in support of the alleged public prior use of the Arno® Clip-Groove tool.

Conversely, the appellant (patentee) requested that the patent be maintained as granted or on the basis of a number of auxiliary requests.

- IV. In the communication accompanying the summons to oral proceedings, the Board expressed, *inter alia*, the preliminary opinion that the Opposition Division did not commit the alleged procedural violations.
- V. Oral proceedings, at the end of which the decision of the Board was announced, took place on 2 February 2010.

The appellant (patentee) requested that the decision under appeal be set aside and the patent be maintained on the basis of claim 1 as (re-)submitted during the oral proceedings (main request) or with the amended description and claims 1-13, both filed at the oral proceedings, and figures 1-4 as granted (auxiliary request).

The appellant (opponent) withdrew the request for reimbursement of the appeal fee. It requested that the decision under appeal be set aside and that the European patent be revoked.

- VI. Independent claim 1 according to the main request reads as follows:

"1. A metal cutting tool (10) comprising an indexable cutting insert (12), comprising two opposing side surfaces (24), and a peripheral edge surface (26) extending therebetween and having an insert axis (A) of rotational symmetry passing through the side surfaces (24); the peripheral edge surface (26) having a plurality of abutment sections (28, 28', 28''), each abutment section (28, 28', 28'') lying on a portion of a side wall (34) of an imaginary regular polygon (36) having a plurality of side walls (34), a plurality of cutting portions (32) extending outwardly from the imaginary polygon (36), the plurality of cutting portions (32) being equal in number to the number of side walls (34) of the imaginary polygon (36), each cutting portion (32) having a cutting edge (38), wherein the cutting edge (38) is formed at the intersection of a rake surface (40) and a relief surface (42), and wherein the rake and relief surfaces (40, 42) are located on the peripheral edge surface (26), each abutment section (28, 28', 28'') being located between two cutting portions (32); and an insert holder (14) comprising an insert pocket (16, 16', 16'') comprising a base surface (18), the cutting insert (12) is retained with the peripheral edge surface (26) being abutted at two abutment sections (28', 28'') only, the insert pocket (16, 16', 16'') comprising a lower support wall (20) abutting a first abutment section (28'), and an upper support wall (22) abutting a second abutment section (28''); the lower support wall (20) and the upper support wall (22) each being fixed and integral parts of the insert holder (14), characterized in that the upper support wall (22) and the lower support wall (20) are straight, and define an acute

angle (α) between them, and wherein lower support wall (20) extends generally uprightly from the base surface (18), and wherein upper support wall (22) also extends generally uprightly from the base surface (18)."

Independent claim 1 according to the auxiliary request reads as follows:

"1. A metal cutting tool (10) comprising an indexable cutting insert (12), comprising two opposing side surfaces (24), and a peripheral edge surface (26) extending therebetween and having an insert axis (A) of rotational symmetry passing through the side surfaces (24); the peripheral edge surface (26) having a plurality of abutment sections (28, 28', 28''), each abutment section (28, 28', 28'') lying on a portion of a side wall (34) of an imaginary regular polygon (36) having a plurality of side walls (34), a plurality of cutting portions (32) extending outwardly from the imaginary polygon (36), the plurality of cutting portions (32) being equal in number to the number of side walls (34) of the imaginary polygon (36), each cutting portion (32) having a cutting edge (38), wherein the cutting edge (38) is formed at the intersection of a rake surface (40) and a relief surface (42), and wherein the rake and relief surfaces (40, 42) are located on the peripheral edge surface (26), each abutment section (28, 28', 28'') being located between two cutting portions (32); and an insert holder (14) comprising an insert pocket (16, 16', 16'') comprising a base surface (18), the insert pocket (16, 16', 16'') comprising a lower support wall (20) abutting a first abutment section (28'), and an upper support wall (22) abutting a second abutment section

(28"); the lower support wall (20) and the upper support wall (22) each being fixed and integral parts of the insert holder (14), the upper support wall (22) and the lower support wall (20) are straight, and wherein the lower support wall (20) extends generally uprightly from the base surface (18), and wherein the upper support wall (22) also extends generally uprightly from the base surface (18), characterized in that, the cutting insert (12) is retained with the peripheral edge surface (26) being abutted at two abutment sections (28', 28") only, wherein the upper support wall (22) and the lower support wall (20) define an acute angle (α) of 36° between them."

VII. The arguments of the appellant (patentee) in support of its requests can be summarized as follows:

The feature of claim 1 as granted according to which the upper and lower support walls were straight was clearly and unambiguously derivable from the application as filed. Basis for this feature were the figures and the disclosure of the abutment sections of the insert lying on a portion of a side wall of an imaginary regular pentagon. Since these abutment sections contacted the upper and lower support walls of the insert pocket, the support walls also had to be straight. Compared to claim 1 as granted, claim 1 according to the main request included the additional limitation of originally filed claim 13 that the upper and lower support walls extended generally uprightly from the base surface. With this amendment it was clear that claim 1 was limited to planar upper and lower walls, and that these walls were essentially perpendicular to the base surface. Originally filed

claim 13 comprised the further feature that the base surface was abutted by a given protruding polygon of the cutting insert. It was clear for the skilled person that this feature was not functionally or structurally linked to the feature that the upper and lower support walls extended generally uprightly from the base surface. Accordingly, the latter feature could be isolated from the combination of originally filed claim 13 without contravening the requirements of Article 123(2) EPC. Claim 1 according to the main request was amended over claim 1 as granted also by reciting that the cutting edge was formed at the intersection of a rake surface and a relief surface that were both located on the peripheral edge surface of the insert. This wording referred to a structural feature of the tool: it specified that the cutting edge extended over the peripheral edge surface of the insert. Although describing in detail a grooving tool having a cutting edge parallel to the axis of the insert, the application as filed was not so limited. It disclosed that the invention could be applied to suit various applications such as turning and threading operations. Cutting inserts used for these operations had cutting edges that were not parallel to the axis of the insert. Therefore, the amendments made to claim 1 in accordance with the main request met the requirements of Article 123(2) and 84 EPC.

Document D5 disclosed a cutting tool comprising an insert holder and a cutting insert held in an insert pocket of the insert holder. Two peripheral abutment sections of the cutting insert were abutted at two positioning surfaces of the insert pocket. The cutting insert was pressed against them by a clamp acting on a

third peripheral abutment section. Accordingly, D5 did not disclose the feature of claim 1 that the cutting insert was retained with the peripheral edge surface being abutted at two abutment sections only. There was no indication in the prior art that would prompt a person skilled in the art to dispense with the clamp. The clamp was described in D5 as essential for maintaining the precise positioning of the cutting insert. The skilled person would also not consider abandoning the feature relating to the clamp in the embodiment according to Fig. 11 where a triangular cutting insert was used. In this embodiment, the chips cut from the workpiece flowed along the abutment section of the insert on which acted the clamp. D5 taught that chip flow occurred only over a limited portion of the abutment section, and therefore the skilled person would provide a clamp of sufficiently small size such that it did not interfere with chip flow. Therefore, the subject-matter of claim 1 according to the main request was not rendered obvious by the available prior art.

Claim 1 according to the auxiliary request was further limited by reciting that the angle between the upper and lower support walls was of 36° . In combination with the other features of claim 1, this feature implied that the cutting insert had the shape of a regular pentagon. D5 disclosed that the insert was of polygonal shape and specifically disclosed triangular, square and hexagonal shapes. It did not disclose a pentagonal cutting insert. Furthermore, claim 1 required that the pentagonal cutting insert be retained in the insert pocket at two non-adjacent sides. There was no indication in D5 suggesting this arrangement, which was

advantageous in terms of stability of the cutting insert during the cutting operation.

The allegedly prior used Arno® Clip-Groove tool related exclusively to a triangular cutting insert and was as such irrelevant to the subject-matter of claim 1 according to the auxiliary request.

VIII. The submissions of the appellant (opponent) can be summarized as follows:

Claim 1 according to the main request introduced subject-matter extending beyond the content of the application as filed because the latter did not mention that the upper and lower support walls were straight. Nor did it disclose that these walls were planar. Furthermore, the feature added to claim 1, according to which the lower and upper support walls extended generally uprightly from the base surface, was only disclosed in combination with the feature that the base surface was abutted by a protruding polygon of the cutting insert. Also, the other feature added to claim 1, according to which the cutting edge was formed at the intersection of a rake surface and a relief surface located on the peripheral edge surface of the cutting insert, was only disclosed in combination with a specific orientation of the cutting edge, parallel to the insert axis, which was not recited in claim 1. This feature also introduced a lack of clarity because it did not define structural features of the insert but related to a possible use thereof. In fact, whether an edge was a cutting edge or not depended on the direction of feed of the tool. Furthermore, it was not

clear what was meant by a wall extending "generally" uprightly.

The subject-matter of claim 1 was not novel over the disclosure of documents D5 and D6. In any case, it did not involve an inventive step when starting from document D5, assuming that this document did not disclose the feature of claim 1 according to which the cutting insert was retained in the insert pocket with the peripheral edge surface being abutted at two abutment sections only. According to the teaching of D5, the insert was located at a precise location by means of two abutment sections contacting two flat positioning surfaces of the pocket of the tool holder. A clamp was then pressed against a further abutment section to press the insert against the positioning surfaces. A fastening screw passing through a central hole of the insert was threadably joined to a hole in the tool holder to hold a side surface of the insert against the base surface of the insert pocket. The skilled person would realize that in the embodiment of Fig. 11, in which a triangular insert was used, chips flowed over the abutment surface on which acted the clamp, and that this would affect chip formation. The skilled person would therefore consider using a clamp that did not act onto the abutment surface. A generally known clamp of this type was an eccentric screw, such as disclosed e.g. by D1. Accordingly, the skilled person would omit the clamp in the embodiment of Fig. 11 of D5, and replace the fastening screw by an eccentric screw, thereby arriving at the subject-matter of claim 1 according to the main request without exercising any inventive skill.

Claim 1 according to the auxiliary request suffered from the same formal deficiencies as claim 1 according to the main request and also lacked an inventive step in the light of D5. This document disclosed that the insert's shape was that of a regular polygon and specifically disclosed triangular, square and hexagonal shapes. D5 did not specifically disclose a pentagon, but the selection of a pentagon was an obvious and arbitrary one. Once the shape of a pentagon was selected, there were only two possibilities for positioning the insert within the pocket: it could only be abutted at two adjacent abutment sections or at two non-adjacent abutment sections. Clearly, the second option was preferable in terms of stability of the cutting insert. This modification of the tool of D5 did not provide any combinatory effect with the modification consisting in omitting the clamp and therefore the two aspects could be examined independently. The sole function of the clamp was to press the insert against the positioning surfaces provided in the pocket. The skilled person would consider it as obvious, in order to solve the problem of allowing faster replacement of the insert, to replace the clamp and the fastening screw in the tool according to D5 by a single means performing both functions. Such means, e.g. an eccentric screw, were generally known. Accordingly, the skilled person would also arrive at the subject-matter of claim 1 according to the auxiliary request without exercising any inventive skill.

The claimed subject-matter also lacked an inventive step having regard to the prior art represented by the allegedly prior used Arno® Clip-Groove tool. It would

be obvious for a skilled person to modify the essentially triangular cutting insert of this tool in view of the teaching of D5 to use other polygonal shapes. As already explained, the skilled person would regard it as obvious to select the shape of a pentagon for the insert, and to retain it in the insert pocket at two non-adjacent sides.

Reasons for the Decision

1. The appeals are admissible.

2. *Main request*

2.1 *Amendments*

2.1.1 Claim 1 of the application as filed discloses that the cutting insert has a peripheral edge surface, that the peripheral edge surface has a plurality of abutment sections, and that each abutment section lies on a portion of a side wall of an imaginary regular polygon. Accordingly, since the side walls of an imaginary polygon are straight, claim 1 as originally filed discloses that the abutment sections are straight. The claim further recites that the cutting insert is retained in an insert pocket having lower and upper support walls, and that these walls abut first and second abutment sections of the insert. Taken in combination with claim 2 as originally filed, defining that the upper and lower support wall define an acute angle between them, i.e. that the upper and lower support walls are, at least in a side view, linear, these features clearly and unambiguously imply that the

sides of the support walls are straight. This is moreover corroborated by the drawings, in particular Fig. 3.

- 2.1.2 Claim 1 is further amended by addition of the feature of claim 12 as granted, which corresponds to claim 13 of the application as filed, according to which the insert pocket comprises a base surface from which the lower and upper support walls extend generally uprightly from the base surface. Since the walls are straight in side view, as explained above, this feature implies that the lower and upper support walls are generally planar.

The appellant (opponent) raised an objection of lack of clarity under Article 84 in respect of this feature due to the presence of the term "generally". Although this feature was already present in claim 12 as granted, and, in principle, Article 102(3) does not allow objections to be based upon Article 84 if they do not arise out of the amendments made (see e.g. T 301/87, OJ 1990, 335), the Board considers that in the present context the term "generally" is sufficiently clear in that it indicates that the support walls are to a great extent perpendicular to the base surface, i.e. excluding portions at their boundaries where deviations may be present due e.g. to a radius of curvature or a chamfer.

The appellant (opponent) also argued that this feature was only disclosed in the specific combination of claim 13 of the application as filed, which includes the feature that the base surface is abutted by a given protruding polygon of the cutting insert. According to the case law of the Boards of Appeal of the EPO, the

isolated extraction of a feature from a set of features is justified on the basis of the specific condition that the skilled person could have readily recognised the absence of any functional or structural relationship among said features (see e.g. T 201/83 OJ EPO 1984, 481 or T 714/00). According to the teaching of the application as filed, whilst the lower support wall, the upper support wall and the base surface of the insert holder have the function of positively locking the cutting insert in the insert pocket (see page 8, last paragraph), the provision of a protruding pentagon on the side surface of the cutting insert is not related to the locking of the cutting insert. Indeed the protruding pentagon provides a suitable shape of the side surface that allows a given side wall thereof to be coplanar with the end surface of the insert holder, thereby maximizing the contact area between the insert and the insert holder without reducing the depth of cut (see the paragraph bridging pages 7 and 8 of the application as filed). The skilled person would therefore readily recognize that there is no teaching implying the presence of a functional or structural relationship between the feature relating to the upper and lower support wall extending generally uprightly from the base surface and the feature relating to the presence of a protruding pentagon.

In this respect it is noted that in a mechanical device such as the metal cutting tool described in detail in the application as filed, it could be speculated that some kind of functional and/or structural link can always be found between the various features of the device (for instance because a feature related to the shape of the insert might e.g. affect the overall

mechanical rigidity of the tool). However, the assessment of whether an amendment consisting in extracting a feature from a disclosed combination of features introduces subject-matter extending beyond the content of the application as filed presupposes determining whether the link forms part of a technical teaching given by the application as filed in respect of the disclosed combination. If, as discussed above, this is not the case, then the extraction of a feature from a set of features disclosed in combination does not provide a new technical teaching.

2.1.3 The appellant (opponent) further argued that the feature added to claim 1, according to which the cutting edge was formed at the intersection of a rake surface and a relief surface located on the peripheral edge surface of the cutting insert, was only disclosed in combination with a specific orientation of the cutting edge, parallel to the insert axis, which was not recited in claim 1. The tool according to the specific embodiment described in the application as filed is, in fact (see in particular Fig. 4), a grooving tool that has a (main) cutting edge (38) parallel to the axis (A) of the insert. However, the application as filed is not limited to this kind of tools: as mentioned on page 1, first paragraph, the invention generally contemplates metal cutting tools for use in turning, grooving, parting and threading operations. For threading operations (see also page 9, lines 11, 12), but also usually for turning operations, the cutting edge is not parallel to the axis of the insert.

The appellant (opponent) further objected that this feature introduced a lack of clarity, as it did not define a clear structural feature of the tool. The Board cannot follow this view. It is true that, generally, a cutting insert has various edges, and that whether an edge acts as a cutting edge depends on the direction of feed. This notwithstanding, it is clear for a skilled person that an edge must be suited for performing a cutting operation in order to designate it as a cutting edge. Furthermore, claim 1 defines that the indexable cutting insert has two opposing side surfaces, a peripheral edge surface, and an axis of rotational symmetry passing through the side surfaces. By reciting that a cutting edge is formed at the intersection of a rake surface and a relief surface that are both located on the peripheral surface, claim 1 makes clear that a cutting edge is provided onto and extends over the peripheral surface (i.e. it is not at the intersection of the side surface and the peripheral edge surface). Therefore, the added feature defines a specific location of a cutting edge, which is certainly a structural feature of a cutting insert.

- 2.1.4 From the above it follows that the modifications over claim 1 as granted, consisting in adding the feature that the support walls extend generally uprightly from the base surface (which must be read in combination with the feature already present in claim 1 as granted - which was objected under Article 100(c) by the opponent - that the upper and lower support walls are straight), and adding the feature that the cutting edge is formed at the intersection of a rake surface and a relief surface that are located on the peripheral edge surface, leads to subject-matter that neither extends

beyond the content of the application as filed (Article 123(2)) nor gives raise to lack of clarity (Article 84 EPC). Since furthermore the amendments restrict the scope of granted claim 1, no objections under Article 123(3) EPC arise either.

2.2 *Novelty*

The appellant (opponent) contested novelty of the subject-matter of claim 1 in accordance with the main request over D5 and D6. Whilst the Board considers that the subject-matter of claim 1 is novel, it is not necessary to discuss this issue in detail since the main request fails for lack of inventive step.

2.3 *Inventive step*

- 2.3.1 The Board agrees with the view of the appellant (patentee) that document D5 represents the closest prior art. Applying the wording of claim 1 of the patent in suit to the disclosure of D5, this document discloses (see Figs. 1 to 2) a metal cutting tool (10) comprising an indexable cutting insert (12), comprising two opposing side surfaces, and a peripheral edge surface extending therebetween and having an insert axis (26) of rotational symmetry passing through the side surfaces; the peripheral edge surface having a plurality of abutment sections (42, 44, 46, 48), each abutment section lying on a portion of a side wall of an imaginary regular polygon (see page 5, last paragraph and page 11, last paragraph) having a plurality of side walls, a plurality of cutting portions (34, 36, 38, 40) extending outwardly from the imaginary polygon, the plurality of cutting portions

being equal in number to the number of side walls of the imaginary polygon, each cutting portion having a cutting edge (58), wherein the cutting edge (58) is formed at the intersection of a rake surface and a relief surface, and wherein the rake and relief surfaces are located on the peripheral edge surface, each abutment section (42, 44, 46, 48) being located between two cutting portions (34, 36, 38, 40); and an insert holder (14) comprising an insert pocket (23) comprising a base surface, the insert pocket comprising a lower support wall (62) abutting a first abutment section (44), and an upper support wall (64) abutting a second abutment section (48); the lower support wall and the upper support wall each being fixed and integral parts of the insert holder (14), wherein the upper support wall (64) and the lower support wall (62) are straight (see page 6, where it is stated that the positioning surfaces 62, 64 are planar; see also Fig. 4A), and wherein (see Fig. 4A which shows a side view of the positioning surface 62) the lower support wall (42) extends generally uprightly from the base surface, and wherein the upper support wall (46) also extends generally uprightly from the base surface (18).

Although reference is made to the Figures 1 to 4A, since they show the complete tool consisting of the combination of tool holder and square cutting insert, this definition also applies to a tool according to D5 having a cutting insert of triangular shape as shown in Fig. 11. In this embodiment, the upper and lower support walls of the insert pocket must be at an angle corresponding to the angle between two abutment sections of the cutting insert, which is an acute angle (60°).

Furthermore, in the embodiment of Figures 1 to 4A, the cutting insert is retained within the insert pocket with the peripheral edge surface being abutted at two abutment sections (44, 46) against the lower and upper support walls (62, 64), and at a third abutment section (48) against the wall (66) of a clamp (70). Contrary to the view of the appellant (opponent), there is no disclosure in D5 that the insert could be abutted at two abutment sections only, even in case of the triangular insert according to Fig. 11. According to the teaching of D5, the lower and upper support walls (62, 64) have the function of positioning the cutting insert, and the clamp has the function of maintaining the cutting insert in position by pressing the abutment sections (44, 46) against said walls (see page 6, central paragraph). Therefore, the passage on page 12 referred to by the appellant (opponent), according to which the insert is positioned on *at least* two planar support surfaces, can only mean that two or more support walls are provided in the insert pocket for positioning the cutting insert. It does not imply that the clamp can be dispensed with.

2.3.2 Therefore, the subject-matter of claim 1 differs from the tool of the embodiment in accordance with Fig. 11 of D5 in that the cutting insert is retained with the peripheral edge surface being abutted at two abutment sections only.

As shown in Fig. 2 of D5 relating to a square insert, the support walls (62, 64) and the clamp (70) abut the insert's abutment sections (66) over most of their length. For the embodiment of Fig. 2, this does not

represent a problem because chip flow occurs onto the fourth abutment section (42). In case of a triangular insert as shown in Fig. 11, however, such arrangement would seriously affect chip formation or even render cutting impossible, since no abutment section is free to provide for unimpeded chip flow. Accordingly, starting from the embodiment in accordance with Fig. 11 of D5, the distinguishing feature solves the objective technical problem of allowing unimpeded chip flow.

- 2.3.3 The skilled person would recognize, on the one hand, that an obvious solution for allowing unimpeded chip flow would be to remove the clamp, and, on the other hand, that the clamp performs the essential function of maintaining the cutting insert in abutment with the positioning surfaces provided by the upper and lower support walls. The skilled person, being presumed to be an ordinary practitioner aware of what is common general knowledge in the art, is aware of means that perform this function without contacting the peripheral edge surface of a cutting insert. For instance, it is generally known in the art to use eccentric screws passing through a central hole of the insert, that not only press the insert against the base surface of the insert pocket but also against the side walls thereof. An example is found in D1, see page 3, lines 12-18. Therefore, in order to solve the above-mentioned objective technical problem, the skilled person would consider it as obvious to use, in the tool according to the embodiment of Fig. 11 of D5, such a means instead of the clamp (70), thereby arriving at the subject-matter of claim 1 without exercising inventive skill (Article 56 EPC).

2.3.4 The appellant (patentee) argued that the skilled person would not have dispensed with the clamp but would have rather used a clamp sufficiently small to allow for unimpeded chip flow over a portion of the abutment section. As a matter of fact, D5 disclosed, in relation to Fig. 5, that chip flow occurred over a very limited portion of the abutment section. In the Board's view it is however questionable whether the skilled person would consider this possibility, since cutting inserts normally used in industry are relatively small and the provision of a small clamp, with a corresponding small screw, would rather appear problematic in practice. In any case, the hypothetical presence of an alternative solution for solving the above-mentioned problem cannot confer inventiveness to a solution which, as explained above, is clearly within the reach of a skilled person.

3. *Auxiliary request*

3.1 *Amendments*

3.2 Claim 1 is amended over claim 1 according to the main request by specifying that the angle between the lower and upper support wall is of 36°. The introduction of this feature, which is found in claim 3 of the application as filed, which corresponds to claim 2 as granted, does not give rise to objections under Article 123(2) or (3) EPC.

3.3 The further amendments concern the dependent claims and the description. These amendments were made without going beyond those necessary to adapt the dependent claims and the description to the terms of the amended

independent claim. Thus, they comply with the provisions of Article 123(2) EPC.

3.4 *Novelty*

The appellant (opponent) did not dispute the novelty of the subject-matter of claim 1. By defining an angle of 36° and abutment sections lying each on a portion of a side wall of an imaginary regular polygon, claim 1 requires that the regular polygon is a pentagon and that the cutting insert is retained only at two non-adjacent abutment sections thereof (the non-adjacent sides of a pentagon form an angle of 36°). It was not contested that the available prior art does not disclose a metal cutting tool with a cutting insert having abutment sections lying on an imaginary pentagon, which is retained with two non-adjacent abutment sections only being abutted at upper and lower support walls of an insert pocket.

3.5 *Inventive step*

3.5.1 Document D5, which represents the closest prior art, discloses a metal cutting tool according to the preamble of claim 1 (cf. also point 2.3.1 above).

3.5.2 The subject-matter of claim 1 differs therefrom by the features according to the characterizing portion, namely that the cutting insert is retained with the peripheral edge surface being abutted at two abutment sections only, and that the upper support wall and the lower support wall define an acute angle of 36° between them.

As explained above, the distinguishing features essentially define that the cutting insert has the shape of a pentagon and is retained within the insert pocket with two non-adjacent abutment sections abutting the lower and upper support walls of the insert pocket.

These features result in the cutting insert being retained within the insert pocket in a manner favourably counteracting the cutting forces exerted on the operative cutting portion during cutting operations. In particular, as stated in the patent in suit (see par. [0034]), in case a screw is used for fastening the insert to the tool holder, the cutting forces are exerted primarily on the lower support wall and on the upper support wall and only minimally on the screw.

Accordingly, the objective technical problem solved by the distinguishing features consists in finding an arrangement of the cutting insert in the tool holder which is favourable for counteracting cutting forces.

- 3.6 Document D5 generally refers to polygonal inserts (page 11, last paragraph), and specifically discloses square (Fig. 3), triangular (Fig. 11) and hexagonal (Fig. 12) inserts. As already explained above (cf. point 2.2.1), according to the teaching of D5 (see Fig. 2), the cutting insert is retained within the insert pocket with two abutment sections (44, 46) being abutted at two support walls (62, 64) and a third abutment section (48) being abutted at the surface of a clamp (70). In the only example given in D5 of the relative arrangement of cutting insert and clamp, namely the embodiment of Figs. 1, 2, 6 and 7 in which the insert has the shape of a square, the cutting

forces exerted on the operative cutting portion (58) during cutting are also counteracted by the clamp (70). If an eccentric screw were provided instead of a clamp, as argued in respect of claim 1 according to the main request, the screw would likewise have to counteract the cutting forces. This is due to the fact that the lower and upper support walls (62, 64) act onto adjacent abutment sections of the cutting insert. This is also true for the embodiment of Fig. 11 in which the cutting insert is triangular and, therefore, is necessarily abutted at two adjacent abutment sections by the support walls. In fact, D5 is not primarily concerned with the problem of counteracting cutting forces but with the problem of quick and precise positioning of a cutting insert in the tool holder (see page 1, first paragraph). More importantly, there is no indication in D5 that would suggest that a configuration favourable in terms of counteracting forces could be achieved by selecting a shape for the insert and a manner of positioning it in the pocket of the tool holder that are both different from those specifically disclosed in D5. Therefore, the claimed solution to the above-mentioned objective technical problem is not rendered obvious by the disclosure of D5.

- 3.7 The appellant (opponent) argued starting from D5 that the skilled person would select an insert having the shape of a pentagon and that he would realize that using two non-adjacent abutment surfaces for its positioning in the tool holder was the most appropriate solution. This argument is not convincing because it is concerned with how the skilled person *could* arrive at the claimed subject-matter, but fails to explain why the skilled person *would* provide such modifications of

the tool of D5. It is therefore based on an *ex post facto* analysis.

3.8 The appellant (opponent) introduced a second line of argumentation taking the allegedly prior used Arno® Clip-Groove tool as the closest prior art. Such tool in accordance with documents D9a-D9g undisputedly includes a cutting insert of triangular shape, i.e. having three abutment sections on its peripheral edge surface. The appellant (opponent) submitted that the skilled person would arrive at the subject-matter of claim 1 in the light of the teaching of D5. D5 rendered obvious the modification of the Arno® Clip-Groove tool consisting in providing a cutting insert of pentagonal shape and positioning it in the pocket of the tool holder at two non-adjacent abutment surfaces. However, since, as explained above, this modification of the tool of D5 is not an obvious one, the modification of the tool with a triangular cutting insert in accordance with D9a-D9g is *a fortiori* not rendered obvious by the teaching of D5.

3.9 Therefore, the subject-matter of claim 1 involves an inventive step (Article 56 EPC) over the available prior art, even if the latter were to include the allegedly prior used Arno® Clip-Groove tool in accordance with documents D9a-D9g. It is accordingly not necessary to actually decide whether the alleged prior use was public.

4. *The alleged procedural violations*

As already indicated in the communication annexed to the summons to oral proceedings, in the Board's view no substantial procedural violation took place during the

opposition proceedings which would have justified the reimbursement of the appeal fee (Rule 67 EPC). The request for reimbursement of the appeal fee being withdrawn, it is not necessary to provide further reasons for this finding.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent with the following documents:
 - claims 1-13 and description columns 1-6, both filed at the oral proceedings before the Board;
 - Figures 1-4 as granted.

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau