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**Datasheet for the decision  
of 29 January 2008**

**Case Number:** T 1332/06 - 3.2.07

**Application Number:** 97921065.5

**Publication Number:** 0904417

**IPC:** C21D 9/22

**Language of the proceedings:** EN

**Title of invention:**

Method for the manufacturing of cutting tools

**Patentee:**

SANDVIK AKTIEBOLAG

**Opponent:**

Kennametal Inc.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Late filed request - admitted"  
"Late filed document - admitted"  
"Inventive step - no"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 1332/06 - 3.2.07

**DECISION**  
of the Technical Board of Appeal 3.2.07  
of 29 January 2008

**Appellant:** Kennametal Inc.  
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**Respondent:** SANDVIK AKTIEBOLAG  
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**Representative:** Lieke, Winfried  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
29 June 2006 concerning maintenance of European  
patent No. 0904417 in amended form.

**Composition of the Board:**

**Chairman:** H. Meinders  
**Members:** P. O'Reilly  
E. Dufrasne

## Summary of Facts and Submissions

- I. Opposition was filed against European patent No. 0 904 417 as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step).

The opposition division decided to maintain the patent in amended form. It held that the subject-matter of claim 1 of the main request was novel and involved an inventive step.

- II. The appellant (opponent) filed an appeal against that decision.

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

The respondent (patent proprietor) requested that the decision under appeal be set aside and the patent be maintained in amended form in accordance with the main request filed during the oral proceedings before the Board on 29 January 2008, or alternatively, in accordance with the first auxiliary request also filed during those oral proceedings.

- IV. The independent claim of the patent as main request reads as follows:

"1. Method for the manufacturing of cutting tools comprising a rotating holder with a plurality of insert seats, which are intended to accommodate an indexable cutting insert of a hard material, the holder being made of steel, wherein the holder is hardened in the regions of the holder in which the insert seats are to be

disposed before the manufacturing of said insert seats in order to reduce the axial and/or radial throws between the insert seats in said cutting tool, wherein the holder is through-hardened to a hardness between 43 and 47 H<sub>R</sub>C and thereafter each insert seat comprising a bottom support surface (7) and at least two support or abutment surfaces (13, 14) is manufactured and a threaded hole (8) is tapped into the bottom support surface, which hole is intended to accommodate a locking screw for the fastening of a cutting insert (3) or a shim screw for the fastening of a shim (4)."

As part of the main request the respondent proposed to delete the passage: "Preferably the support surfaces are rough-formed prior to the hardening step and are finish-formed after the hardening step." from column 2, lines 47 to 50 of the patent in suit.

The independent claim of the first auxiliary request reads as follows (amendments when compared to claim 1 of the main request are depicted in bold):

"1. Method for the manufacturing of cutting tools comprising a rotating holder with a plurality of insert seats, which are intended to accommodate an indexable cutting insert of a hard material, the holder being made of steel, wherein the holder is hardened in the regions of the holder in which the insert seats are to be disposed before the manufacturing of said insert seats in order to reduce the axial and/or radial throws between the insert seats in said cutting tool, **wherein the rotating holder is a milling cutter body,** ~~characterized in that~~ **wherein** the holder is through-hardened to a hardness between 43 and 47 H<sub>R</sub>C and

thereafter each insert seat comprising a bottom support surface (7) and at least two support or abutment surfaces (13, 14) is manufactured and a threaded hole (8) is tapped into the bottom support surface, which hole is intended to accommodate a locking screw for the fastening of a cutting insert (3) or a shim screw for the fastening of a shim (4), **said milling cutter body being manufactured starting off from a piece of bar of tool steel which is rough-turned to the desired shape of the intended milling cutter body before the hardening.**"

V. The documents cited in the present decision are the following:

D1: US-A-4 108 692

D6: EP-A-0 449 253

D7: Hartbearbeitung in der Praxis, Tonshott et. al.,  
WT Wissenschaft und Technik, Juni 1992, Springer-  
Verlag

VI. The arguments of the appellant may be summarised as follows:

(i) The new main request filed during the oral proceedings should not be admitted into the proceedings since it is late filed. No new arguments were produced in the oral proceedings during the discussion of the preceding main request which could have justified the late filing of the request.

D7 was filed with the appeal grounds in anticipation of an amendment introducing the range

of hardness values into the independent claim and should be admitted into the proceedings.

- (ii) The subject-matter of claim 1 of the main request does not involve an inventive step.

The prior art manufacturing of tool bodies discussed in D6 implicitly involves through-hardening. Through-hardening is the most normal way of hardening so that the skilled person when reading in D6 about the prior art would understand that through-hardening is implied as the hardening treatment. Even if through-hardening is not considered to be implicitly disclosed it is nevertheless the most normal form of hardening used by the skilled person so that the feature would be provided as a matter of course.

The feature of claim 1 of manufacturing the insert seats after the hardening treatment is disclosed in D6. The term "manufacturing" does exclude some prior working. The patent in suit itself refers to the support surfaces being "rough-formed prior to the hardening step" and "finish-formed after the hardening step" (see column 2, lines 48 to 52). This is consistent with the statement in D6 that the tools are "machine-finished" after hardening. This step in D6 corresponds to the meaning of the term "manufacturing" as used in claim 1 of the patent in suit.

Although the respondent argues that the claimed range of hardness values produces good fatigue

resistance it has not backed up this assertion with evidence.

(iii) The subject-matter of claim 1 of the first auxiliary request lacks an inventive step. It is standard practice to manufacture cutting tools starting from a bar of tool steel and to rough turn this as is indicated in the patent itself in column 1, line 49 to column 2, line 3. Therefore the extra feature of this claim compared to claim 1 of the main request is a standard measure for the skilled person.

VIII. The arguments of the respondent may be summarised as follows:

(i) The amendment to claim 1 of the main request is based on an existing dependent claim. It was not made earlier as the representative of the respondent was not aware that the specified range of hardness values was one in which the respondent was commercially active. The amendment does not raise any complicated matter and is not surprising since it has already been discussed. Moreover, there would be no delay in the proceedings.

D7 was late filed and should not be admitted into the proceedings.

(ii) The subject-matter of claim 1 of the main request involves an inventive step.

The prior art discussed in D6 does not disclose through-hardening as required by claim 1 of this

request. Hardening is mentioned but it is not stated to be through-hardening. The hardening would not normally be through-hardening.

It is not disclosed in D6 that the seats and threaded holes are "manufactured" after the hardening step. Manufacturing implies the complete formation of the seat without any prior working. This is clear from the patent since the only reference to rough working is the disclosure of turning the initial steel bar. However, turning by its nature cannot form the insert seats or the threaded hole. It is true that the description of the patent in suit refers to the seat support surfaces being "rough-formed". The skilled person would realise that this reference is inconsistent with the wording of claim 1 as granted and disregard it, which is why it is proposed to delete the reference in the amended description which is filed as part of the request. Since D6 refers to the seats being "machine-finished" after the hardening step there must have been some prior working of the seats so that the seats were not "manufactured" after the hardening step.

The claimed range of hardness values leads to good fatigue resistance which is a desirable feature.

- (iii) The subject-matter of claim 1 of the first auxiliary request involves an inventive step. Rough-turning is known but by its nature cannot result in, i.e. manufacture, seats. D6 does not indicate the manufacture of seats after hardening to a value in the claimed range.



## **Reasons for the Decision**

### *Main request*

#### 1. *Admissibility of the request*

1.1 The main request was filed during the oral proceedings before the Board. The request differs from the preceding main request, which was pending at the start of the oral proceedings, in that the range of hardness values between 43 and 47 H<sub>R</sub>C has been added to claim 1. This range was disclosed in claim 3 as granted as a preferred range. The appellant objected to the admittance of the request on the basis that it was late filed and in its opinion the need to file it did not arise out of the discussions during the oral proceedings concerning the preceding main request. The representative of the respondent indicated that the request was filed because of the views expressed by the Board regarding the preceding main request and had not been filed earlier because he had not realised that the respondent had a commercial interest in the specified hardness range. It noted that it would be no surprise and cause no delay in the proceedings.

1.2 The Board notes that the amendment is based on a granted claim, of which there were only three, that the appellant had attacked the claim in its notice of opposition, and that in its appeal grounds it had filed a document (D7) in anticipation of the possible amendment. Taking into consideration these points and also that the content of the amendment was easy to deal

with and led to a convergence of the debate the Board decided to admit the request.

2. *Admissibility of late-filed document*

D7 was filed by the appellant along with the appeal grounds in anticipation of a possible amendment to the independent claim to include the range in hardness values. Since such an amendment was made in a request filed during the oral proceedings (see above) the Board considered it equitable to admit the document which was already filed in anticipation of such an amendment, taking into account that the document had been filed at the start of the appeal proceedings, so that the respondent could not be surprised by it.

3. *Inventive step*

- 3.1 The appellant argued lack of an inventive step in the subject-matter of claim 1 starting from D6. D6 contains a discussion of the prior art in which there are described two different prior art methods of making a cutting tool. The appellant based its arguments on the method that is disclosed in column 2, line 54 to column 3, line 16 of D6. In that passage a method of manufacturing a cutting tool is described wherein the tool body is heat treated to 30-40 Rockwell C hardness. The two abutment faces are then "machine-finished" and the threaded hole is formed. It is stated that such a prior art method produces a tool body with insufficient hardness. However, bodies having a higher hardness value could apparently not be worked at that time.

3.2 The respondent argued that there was no disclosure in this statement of prior art in D6 of a through-hardening as required by claim 1 of the main request. The appellant argued that through-hardening was the most normal manner of hardening so that this feature was implicit to the skilled person.

The Board agrees with the respondent that through-hardening is not disclosed in the prior art method described in D6. For an implicit disclosure of a feature it is necessary that the skilled person reads the feature into the disclosure without its explicit mention because nothing else was possible. If, however, there is more than one possibility for the non-mentioned feature, as was admitted by the appellant, then none of these possibilities is disclosed. The Board concludes therefore that the feature of through-hardening is not disclosed in D6.

3.3 Although the feature of through-hardening is not disclosed in the prior art method described in D6 the Board considers that its provision is obvious to the skilled person. Through-hardening is a standard procedure in the treatment of steel. The patent in suit itself mentions through-hardening in its discussion of the prior art as reflected in D1 (see column 2, lines 4 to 7 of the patent in suit). Since D6 does not mention the type of hardening which results from the heat treatment the skilled person would have to decide whether or not to through-harden. In considering this the skilled person would know that the machine finishing mentioned in D6 would remove material so that it would be necessary that after this machining the exposed surface was of hardened material which hints towards

through-hardening. It has not been shown that any surprising effect results from the use of through-hardening. The Board therefore considers this as a standard practice which the skilled person would use without employing an inventive step.

3.4 The respondent argued that D6 did not disclose "manufacturing" of the seats after the hardening step. In the view of the respondent "manufacturing" meant that the seat in its entirety was formed after the heat treatment, i.e. there was no prior working towards forming the seats before the hardening step. The Board, however, does not consider that this term can be interpreted so narrowly. The description of the patent in suit in column 2, lines 47 to 50 (which has a counterpart in the application as filed on page 3, lines 8 to 9) indicates that preferably the support surfaces are "rough-formed" prior to the hardening step and then "finish-formed" after the hardening step. The skilled person considering claim 1 in the light of the description would conclude that the manufacturing of the seats after hardening did not exclude a preceding rough forming of the seats.

3.5 Along with the amended claims for the main request the respondent filed an amended description in which the above-mentioned passage in column 2, lines 47 to 50 was deleted, arguing that it was clear to the skilled person that this passage contradicted the independent claim. The Board cannot agree with the respondent in this respect. The passage was not in disagreement with the claim since the claim did not indicate the extent of forming of the seat that took place during the "manufacturing". The skilled person would have

understood that it was preferable to first carry out a rough-forming since that would allow a large amount of the work to be carried out on the tool in a non-hardened state when it was easier to work. The skilled person when considering the term "manufacturing" would interpret the term in the light of the description as originally filed which contained the passage presently proposed for deletion. A subsequent deletion of the passage cannot lead to a different interpretation of the claim as such a change of meaning of the claim could lead to an unallowable increase in the disclosure content of the patent.

- 3.6 This view is also consistent with the presence of claim 2 in the patent (which has a counter-part in claim 3 of the application as originally filed) which refers to rough-turning a bar of tool steel before the hardening. Whilst turning may imply only rotary cutting this step does not exclude a further rough-forming step for the support surfaces.

When interpreting the term "manufacturing" in the light of the description as originally filed the conclusion reached by the Board is that "manufacturing" of the seat after the hardening does not exclude that there has been a preceding rough-forming.

- 3.7 This means that the statement in D6, column 3, lines 2 to 3 that the abutment surfaces are "machine finished" is also consistent with claim 1 as interpreted by the Board so that the feature of manufacturing the seats after the hardening is disclosed in D6.

3.8 The feature of claim 1 that the tool holder is through-hardened to a hardness of between 43 and 47 H<sub>R</sub>C, i.e. Rockwell C hardness, is not disclosed in D6 and the appellant did not seek to argue that this was the case. D6 indicates a hardness of 30-40 H<sub>R</sub>C (see column 2, line 57 to column 3, line 2) as being the limit. It indicates that this does not form a satisfactory tool (see column 3, lines 12 to 16). There was thus a desire expressed in D6 that the hardness should be increased though at that time it was not possible due to inadequate cutting tools. It is also explained in the description of the prior art in the patent in suit in column 2, lines 3 to 18 that when a cutter body is shaped before hardening it is hardened to preferably 43 to 47 H<sub>R</sub>C which means that there was a desire to have this hardness in the finished product. In the description of the embodiments in column 3, line 55 to column 4, line 14 it is explained that modern cutting tools can cut hardened steel of 45 H<sub>R</sub>C.

3.9 The respondent argued that there was a prejudice against using cutting tools on steel that was hardened to a hardness in the claimed range. The respondent based this argument on the fact that such tools were known, arguing that despite this they were not used to carry out the claimed method. The respondent, however, produced no evidence for such a prejudice.

The Board considers that when tools become available to carry out a task for which a desire already existed then the skilled person would use these tools and carry out that task so that it was obvious to harden the steel to a hardness in the claimed range of hardness values and only then to produce the insert seats by milling.

- 3.10 The respondent further argued that the claimed range of hardness values produced good fatigue resistance. The application as originally filed gives no indication of such an effect and no evidence has been presented that it was actually obtained. Even if there were such an effect it would not affect the question of inventive step since it was known to be desirable to manufacture tools having a hardness value in this range as indicated in column 2, lines 6 to 14 of the patent in suit.
- 3.11 As explained above the features of claim 1 of the request which the respondent argues are not known or obvious are in the view of the Board known or obvious to the skilled person.

The Board concludes therefore that the subject-matter of claim 1 of the main request does not involve an inventive step in the sense of Article 56 EPC.

*First auxiliary request*

4. *Inventive step*

- 4.1 Claim 1 of this request, compared with claim 1 of the main request, contains in addition the feature of claim 2 as granted that the rotating holder is a milling cutting body that is manufactured from a bar of tool steel and rough-turned before the hardening.

According to column 1, line 49 to column 2, line 3 of the patent in suit it is known to manufacture a milling cutter body from a bar of tool steel. The shape and form are established by turning the basic shape and milling

out the seats. The skilled person would apply this general teaching to the prior art as described in D6. This is particularly the case since D6 refers to the seats being "machine-finished" after the hardening step which hints towards a rough-forming before the hardening step.

- 4.2 Therefore, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

## **Order**

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

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders