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**D E C I S I O N**  
**of 23 October 2001**

**Case Number:** T 0124/98 - 3.2.6

**Application Number:** 90303590.5

**Publication Number:** 0392730

**IPC:** B23C 5/22

**Language of the proceedings:** EN

**Title of invention:**

A cutting insert for a milling cutting tool

**Patentee:**

ISCAR LTD

**Opponents:**

Widia GmbH  
Seco Tools AB  
Walter AG  
TRIBO Hartmetall GmbH

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 52(1), 54(1), 56, 123(2),(3)  
EPC R. 57a, 88

**Keyword:**

"Admissibility of amendments - yes"  
"Novelty - yes"  
"Inventive step - yes"

**Decisions cited:**

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**Catchword:**

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Case Number: T 0124/98 - 3.2.6

**D E C I S I O N**  
**of the Technical Board of Appeal 3.2.6**  
**of 23 October 2001**

**Appellant:**  
(Opponent 01)

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted 8 December 1997  
rejecting the opposition filed against European  
patent No. 0 392 730 pursuant to Article 102(2)  
EPC.**

**Composition of the Board:**

**Chairman:** P. Alting van Geusau

**Members:** G. C. Kadner

J. C. M. De Preter

## Summary of Facts and Submissions

I. The mention of grant of European patent No. 0 392 730 in respect of European patent application No. 90 303 590.5 claiming a GB-priority from 12 April 1989 and filed on 4 April 1990 was published on 11 August 1993.

II. Four notices of opposition were filed against this patent with requests for revocation based on the grounds of Article 100(a) EPC (lack of novelty by opponents 03 and 04, lack of inventive step by all opponents). By decision announced on 17 October 1997 and posted on 8 December 1997 the Opposition Division rejected the oppositions.

The Opposition Division was of the opinion that the relevant prior art did not contain any suggestion towards the combination of features of the claimed cutting insert for a milling cutting tool.

III. Notices of appeal were lodged against this decision by Opponent 03 on 30 January 1998 and on 5 February 1998 by Opponent 01, each of them together with payment of the appeal fee.

The statements of grounds of appeal were filed on 8 April 1998 (Opponent 01) and on 20 April 1998 (Opponent 03).

Opponent 03 withdrew its appeal on 18 July 2000.

IV. In a communication pursuant to Article 11(2) of the Rules of Procedure of the Boards of Appeal dated 18 October 2000 sent together with the summons to oral

proceedings the Board expressed doubts as to whether the subject matter of claim 1 was novel when compared to the disclosure of D10 (US-A-2 212 012). In the oral proceedings discussion also would be necessary on the issue of inventive step when considering documents D1 (EP-A-0 239 045), D2 (DE-A-36 18 574) and D5 (DE-A-37 14 533).

V. Oral proceedings were held on 22 October 2001.

The Appellant (Opponent 01) had informed the Board that it would not be represented at the oral proceedings. In writing it had requested that the decision under appeal be set aside and that the European patent 0 392 730 be revoked.

The Respondent (Patentee) requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 4 and of the description (pages 1 to 6) as submitted at the oral proceedings, and Figures 1 to 17 as granted.

Amended claim 1 reads as follows:

"Cutting insert for use in a peripheral rotary milling cutter having a cylindrical holder (20a) and at least one replaceable, peripherally disposed cutting insert (21), the cutting insert (21) being formed with at least one cutting edge (22) defined between a cutting rake surface (25) and a relief flank surface (24) of the insert (21) disposed on the holder so as to present a non-zero axial rake angle, the cutting rake and relief flank surfaces (25, 24) being continuously curved so that the insert rake and relief angles ( $\hat{\alpha}$ ,  $\tilde{\alpha}$ ) as defined with respect to the cylindrical holder (20a)

remaining invariant along the length of the cutting edge (22), characterised in that said cutting edge (22) is inclined with respect to the corresponding edge (21a) of the insert base by an angle which remains invariant along the length of the cutting edge so as to impart to the insert an axial rake angle of relatively increased magnitude."

The further parties to the proceedings, Opponents 02, 03 and 04 also were not present at the oral proceedings. Opponents 02 and 04, and Opponent 03 after its withdrawal of appeal, did not file any requests.

VI. In support of its requests the Appellant essentially relied upon the following submissions:

The subject-matter of granted claim 1 was at least obvious by a combination of the teachings of D1 or D2 with those of D5. The precharacterising features were disclosed in D1 as well as in D2. Particularly cutting edges following an elliptical curve were shown in Figure 26 of D2. Constant or nearly constant angles between the cutting edge and the corresponding edge of the insert base were known from Figures 28 and 31 of D2 or from Figures 12 and 13 of D5.

Since the Appellant was not present at the oral proceedings no arguments were put forward with respect to the new claim 1 in which the terms "substantially" were deleted.

VII. The arguments of the Respondent are summarised as follows:

Document D1 was younger than D10 and mentioned firstly

constant relief and rake angles in connection with a cutting plate. Therefore a skilled person would not understand the disclosure of D10 as including a constant relief angle since expressis verbis only a constant rake angle was mentioned. Both documents dealt with helical cutting edges, and in these cases the angle between the cutting edge and the base edge of the cutting inserts could not remain constant. None of the prior art documents contained any hint to use a cutting edge of elliptical shape and therefore the subject-matter of claim 1 was novel and inventive.

### **Reasons for the Decision**

1. The appeal of Opponent 01 is admissible.
  
2. *Amendments*
  - 2.1. Amended claim 1 differs from claim 1 as granted in that the term "substantially" was deleted in two places (patent specification, page 7, lines 1 and 3) thereby restricting the claimed subject-matter to the cutting edge being part of an ellipsoid formed by the intersection of a cylinder whose radius corresponds to the cutting envelope with a plane positioned at an angle corresponding to the axial rake angle and consequently avoiding anticipation by a cutting insert with a helical cutting edge (e.g. as disclosed in D10) which, considering the scale of measurement involved, might also be considered to have a cutting edge with a "substantially" invariant angle in its length of (limited) extension as defined in claim 1. It is to be noted that the deletion of "substantially" does not mean a restriction to exact theoretically geometrical



relation of the angles concerned but is interpreted to include those deviations resulting from production tolerances.

The description was adapted to the subject-matter claimed and further includes a correction in the mathematical relationship shown on page 6 of the patent specification which is the correction of an obvious error in the denominator of this formula.

- 2.2. In view of the above assessments the amendments are admissible under Article 123(2), (3) and Rules 57a and 88 EPC.

3. *Novelty*

In view of the limitation of the subject-matter of claim 1 to exclude helical cutting edges, the Board concurs with the Opposition Division's conclusion with respect to novelty in that none of the cited documents discloses a cutting insert with the claimed relation of angles of the cutting edge, rake and relief angles and insert base.

Lack of novelty was not contested by the Appellant nor raised by the other parties to the appeal proceedings.

4. *Inventive step*

- 4.1. The closest prior art is represented by D1. This document discloses a cutting insert for a milling cutting tool having a cylindrical holder 1 and two replaceable, peripherally disposed cutting inserts 6,7, the cutting inserts 6,7 being formed with cutting edges 10 defined between a cutting rake surface and a relief

flank surface of the insert 6,7 disposed on the holder so as to present a non-zero axial rake angle, the cutting rake and relief flank surfaces being continuously curved so that the insert rake and relief angles ( $\hat{\alpha}$ ,  $\acute{\alpha}$ ) as defined with respect to the cylindrical holder 1 remaining invariant along the length of the cutting edge 10.

- 4.2. Starting from this known milling cutter with indexable inserts the problem underlying the patent is to provide a new and improved peripheral rotary milling cutter having cutting inserts in which the disadvantages of the prior art are reduced or overcome. Particularly it is desired to increase the tool life by preventing structural weakening of the cutting edge of the tool accompanied by the danger of insert breakage, to reduce cutting forces and to achieve a smooth milled surface (see page 2, line 39 to page 3, line 5 of the patent in suit).
- 4.3. These problems are solved by a cutting insert for use in a peripheral rotary milling cutter according to the precharacterising portion of claim 1 by providing a cutting edge (22) which is inclined with respect to the corresponding edge (21a) of the insert base by an angle which remains invariant along the length of the cutting edge so as to impart to the insert an axial rake angle of relatively increased magnitude.
- 4.4. The prior art milling cutter according to D1 has the usual insert pockets the basis of which are helically positioned in the longitudinal direction of the tool (see abstract) and the cutting edges of the cutting plates are generally parallel with the corresponding base edge (see Figures 4, 5). No suggestion whatsoever

is derivable from D1 to change the position of the insert itself or of the cutting edge with respect to the base plane.

- 4.5. A combination with the teachings of D10 also cannot lead to the claimed subject-matter because this document again relates to an insert with a helical form of the cutting edge, and therefore fails to suggest the elliptical shape of the cutting edge and furthermore lacks any incentive to increase the axial rake angle.
- 4.6. The cutting plates disclosed in D2 and D5 do not come closer to the claimed subject-matter than those of D1 and D10 and therefore cannot give any suggestion towards the claimed subject matter either. Consequently the cutting plate according to claim 1 involves an inventive step (Article 56 EPC).
5. In view of the above findings the Board comes to the conclusion that the proposed solution of the technical problem underlying the patent in suit defined in the independent claim 1 is novel and inventive and that this claim as well as its dependent claims 2 to 4 relating to particular embodiments of the invention comply with the criteria of patentability (Article 52[1] EPC).

## **Order**

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

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent on the basis of claims 1 to 4 and of the description (pages 1 to 6) as submitted at the oral proceedings, and Figures 1 to 17 as granted.

The Registrar:

The Chairman:

M. Patin

P. Alting van Geusau