

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

Aktenzeichen / Case Number / N^o du recours : T 334/87 - 3.2.2

Anmeldenummer / Filing No / N^o de la demande : 81 850 195.9

Veröffentlichungs-Nr. / Publication No / N^o de la publication : 0 052 585

Bezeichnung der Erfindung: Cutting tool

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : B23B 27/16

ENTSCHEIDUNG / DECISION

vom / of / du 1 August 1989

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Santrade Ltd.

Einsprechender / Opponent / Opposant :

Montanwerke Walter GmbH
Metallwerk Plansee GmbH

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Articles 54, 56, 123

Schlagwort / Keyword / Mot clé :

"allowable amendments"
"novelty (yes)"
"inventive step (yes)"

Leitsatz / Headnote / Sommaire



Case Number : T 334/87 - 3.2.2

Beglaubigte Abschrift
Certified Copy
Copie certifiée conforme

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 1 August 1989

Appellant :
(Proprietor of the patent)

Santrade Ltd.
Alpenquai 12
P.O. Box 321
CH-6002 Luzern

Representative :

Seiffert, Klaus
Gustav-Freytag-Strasse 25
Postfach 6145
D-6200 Wiesbaden 1

Respondent 01 :
(Opponent)

Montanwerke Walter GmbH
Derendinger Straße 53
D-7400 Tübingen

Representative :

Rüger, Rudolf, Dr.-Ing.
Patentanwälte
Dr.-Ing. R. Rüger
Dipl.-Ing. H.P. Barthelt
Webergasse 3
Postfach 348
D-7300 Esslingen/Neckar

Respondent 02 :
(Opponent)

Metallwerk Plansee GmbH
A-6600 Reutte
Tirol

Decision under appeal :

Decision of the Opposition Division of the European
Patent Office dated 11 August 1987 revoking
European patent No. 52585 pursuant to
Article 102(1) EPC.

Composition of the Board :

Chairman : G. Szabo

Members : H. Seidenschwarz
W. Moser

Summary of Facts and Submissions

- I. European patent No. 52 585 comprising seven claims was granted on 16 January 1985 in response to European patent application No. 81 850 195.9 filed on 22 October 1981.
- II. Oppositions were filed against the European patent requesting that it be revoked on the grounds of lack of novelty and/or inventive step.
- III. The Opposition Division revoked the European patent No. 52585 by its decision dated 11 August 1987 on the grounds that the subject-matter of Claim 1 as granted did not involve an inventive step in view of the teaching disclosed in US-A-3 341 923 and the document "Draft Proposal ISO/DP 6987 E", dated August 1979, ISO/TC 29 (Secr.-1403) 1811.
- IV. The Appellant (Proprietor of the patent) lodged an appeal against the decision on 7 October 1987, paying the appeal fee on the same date. The Statement of Grounds, including a new Claim 1, was received on 30 November 1987.

In response to the Communication of the Board of Appeal of 26 April 1989, the Appellant filed a main request and auxiliary requests concerning Claim 1 and the description of the patent in suit with his letters respectively dated 30 May and 25 July 1989.
- V. During the oral proceedings held on 1 August 1989, the Appellant withdrew his auxiliary requests. He argued that Claim 1 according to the main request complied with Article 123 EPC and that its subject-matter was sufficiently clear and complete as well as novel and inventive.

This Claim 1 reads now as follows:

"Cutting tool comprising a cutting insert holder (10) having an insert-receiving site which includes a base surface (13), a side support (15) and a threaded bore (11) in the base surface (13), a positive cutting insert (12) seated within the insert-receiving site in contact with the base surface (13) and the side support (15), the insert (12) having a hole (14) therethrough which includes a first contact surface (22) decreasing in cross-sectional area in a direction towards the base surface (13), a locking screw (16) extending through the hole (14) and threadedly mounted in the bore (11), said screw (16) including a head (17) at one end thereof, a threaded portion at another end thereof and a waist situated therebetween, said head (17) being disposed within the hole (14) and including a second contact surface (19) engaging the first contact surface (22) and imposing a clamping force thereagainst to clamp the insert (12) to the holder (10), the head (17) being arranged eccentrically relative to a longitudinal axis of the screw (16), the largest cross section of the head (17) being less than the smallest cross section of the hole (14), such that upon loosening of the screw (16) by about one-half turn the insert (12) is slidably removable over the head (17), c h a r a c t e r i z e d in that one of the first and second contact surfaces (22 and 19, resp.) is of convex configuration, and the other is of conical configuration to produce point contact (23) therebetween, the conical surface being oriented at an acute angle relative to the base surface (13) so that the clamping force has directional components (A, B) extending towards the base surface (13) and the side support (15), and in that the head (17) of the screw is bent such that it is

eccentrically positioned relative to the waist and the threaded portion of the locking screw (16), towards the contact point (23), when mounted, and has an unsymmetrical cross-section, taken along a plane including the center axis (C_1) of the bore (11) and said contact point (23)."

VI. The Respondents (Opponents) were of the opinion that

- (i) from the application as filed and the description as granted, the shape of the locking screw and in particular the feature concerning the "waist" of that screw as specified in the new Claim 1 could not be derived as essential to the invention, and
- (ii) the limitation in the new Claim 1 "... towards the contact point, when mounted, and ... taken along a plane including the center axis of the bore and said contact point" was unclear, because the position of the contact point was arbitrarily provided on the wall of the insert hole, e.g. within the sector 8 as shown in Figure 2 as granted, and depended on the position of the beginning of the thread of the screw in the insert hole.

VII. The Respondent I (Opponent I) also argued that the subject-matter of Claim 1 was not novel with respect to DE-A-2 164 496 or its corresponding US-A-3 805 351, which had not only disclosed the same technical problem to be solved but also the same solution (cf. in addition DE-A-2 164 496, page 4, lines 11 to 19, line 30 to page 5, line 1; page 5, lines 19 to 29; page 9, lines 17 to 22; page 11, lines 10 to 32; page 12, lines 1 to 9 and 15 to 23; and Claims 1, 13 and 16 as well as US-A-3 805 351, column 2, lines 42 to 53; column 6, line 50 to column 7, line 17; line 53 to column 8 and line 1 (Claim 1)).

He also submitted with respect to DE-A-2 164 496 that

- this document did not differentiate between a positive and a negative cutting insert and, therefore, the known cutting tool was not limited to a tool comprising only a negative cutting insert;
 - the expressions "Druckstelle" and "flächenmässig eng umgrenzt" would stand for "small area" within the meaning of "point contact";
 - the unsymmetric cross-section of the head results from the description of the head ("Spannkopf 19") described on page 11, last sentence;
 - according to page 12, from which three equivalent modifications of the known cutting tool could be derived, namely
 - (a) a locking screw with a head having a spheroidal contact surface,
 - (b) a locking screw with and without a waist and
 - (c) a cutting insert having holes countersunk on one or both sides, or conical or biconical holes,
- the invention of the patent in suit would also be comprised by said document.

VIII. The Respondent II (Opponent II) added, with regard to the inventive step, that

- the eccentric clamping of cutting inserts was known from both US-A-3 341 923 and DE-A-2 164 496;

- the expression "the head is bent" included each deviation from an embodiment of a screw's head which was symmetrical to its centerline;
- such screw's head having an unsymmetrical shape was, however, known: cf. e.g. DE-A-2 359 059.

Therefore, in view of this prior art in combination with the teaching disclosed in the document "Draft Proposal ISO/DP 6987 E" the subject-matter of the new Claim 1 would also not involve an inventive step.

IX. The Appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the following documents:

- Claim 1 filed on 26 July 1989
- Claims 2 to 7 as granted
- description and drawing as granted.

The Respondents requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.
2. Amendments
 - 2.1 Claim 1 comprises a combination of the features mentioned in Claim 1, the description (cf. column 1, lines 20 to 24; column 2, lines 4 to 16 in combination with the lines 49 to 61) and Figure 2 as granted.

From the description and Figure 2 it is clear that

- the "essential part" of the invention is the "end part" of the locking screw, and
- the rest of the locking screw consists of a waist and a threaded portion.

As the feature "waist" means an embodiment of a locking screw mentioned in US-A-3 341 923, which is cited in the description of the patent in suit and forms the basis of the further development according to the present invention, the inclusion of this feature in Claim 1 is, therefore, allowed (cf. T 288/84, "Activated support/Stamicarbon" OJ EPO, 1986, 128, Point 6.5 of the Reasons and Headnote).

Consequently, there is no formal objection to the current version of Claim 1, since this is also adequately supported by the description as filed and represents a restriction in scope.

Amended Claim 1 therefore complies with Article 123(2) and (3) EPC.

- 2.2 According to the Respondents, Claim 1 contains a substantive amendment which they believe to be unclear (see Point VI(ii)).

After exercising its power to deal with grounds and issues arising from the substantive amendment (following T 227/88, "Detergent compositions/UNILEVER", 15 December 1988, Point 3 of the Reasons and Headnote (II); to be published in the OJ EPO), the Board takes the view that this amendment is also clear and allows an

examination of Claim 1 on the grounds of Article 100(a) EPC. This is because it is evident from the Figures 1 and 2 of the patent in suit that the position of the contact point (23) between the contact surfaces is the point where the tangent at the convex hole wall (22) has the same gradient as the conical contact surface (19). Therefore, the plane including the centre axis (1) and the contact point (23) must not exactly correspond to that plane II-II, which is shown in the Figures and which represents the optimal conditions. The contact point may be positioned in a sector ϕ as defined in the description (see EP-B-0 052 585, column 3, lines 53 to 55). Furthermore, the beginning of the threads of the screw determines only the point where these engage in the threads of the cutting insert holder.

3. Novelty

- 3.1 In the opinion of the Respondent I DE-A-2 164 496 represents the most relevant state of the art which also anticipates the novelty of the subject-matter of Claim 1.

According to the findings of the Board, a cutting tool known from this document is actually the closest prior art with respect to the subject-matter of Claim 1. In the description of the known cutting tool, namely, it is mentioned that an embodiment is also conceivable, in which the contact surface of the head of the locking screw might have a spheroidal ("ballige") form. Furthermore, the cutting insert might have a conical hole (cf. DE-A-2 164 496, page 12). From these a point contact between both contact surfaces and an acute angle of the conical surface relative to the base surface results.

The cited document, however, leaves it undecided whether a positive cutting insert or a negative cutting insert is

used in the known cutting tool. It is accepted that a generic disclosure does not take away the novelty of a specific example falling within the terms of that disclosure (cf. also Guidelines, Part C, Chapter IV-7.4). Therefore, a cutting tool comprising a positive cutting insert is not disclosed in this prior art document.

Furthermore, it is shown in the Figures 1, 4 and 5 of the aforementioned document that the head of the locking screw is eccentric as its longitudinal axis is parallel off-centre from the longitudinal axis of the waist and threaded portion of the locking screw. With respect to this parallelism of both axes it is clear that a head being bent away from the longitudinal axis is not intended in either case.

In addition, Figures 1, 4 and 5 also show that the head is symmetrical with respect to its longitudinal axis. This embodiment is not in contradiction to the description of these Figures on page 11, last sentence, of DE-A-2 164 496. The description only discloses to provide a limited segment of a conical surface for the head's contact surface, which conical surface is shortened in the "circumferential direction". Such a modification of the conical surface, however, does not affect the symmetry of the head relative to its longitudinal axis.

It is, however, characteristic for these designs that a small component of clamping force in the direction towards the base surface is maintained in order to enable the cutting insert to be removed from around the head, as the removal is restricted by the size of the inclination angle, which the conical shaped contact surface forms with the base surface.

3.2 Consequently, the subject-matter of Claim 1 of the patent in suit differs from the known cutting tool in the sense that

- the cutting insert is a positive one,
and
- the head of the locking screw is bent, such that it is eccentrically positioned relative to the rest of the locking screw and that it has an unsymmetrical cross-section.

3.3 None of the other documents cited in the proceedings before the European Patent Office discloses a cutting tool according to Claim 1. To give reasons in detail is unnecessary since the Respondents did not dispute the novelty with respect to this state of the art.

3.4 Hence, the subject-matter of Claim 1 is novel within the meaning of Article 54 EPC.

4. Inventive step

4.1 It follows from the discussions during the oral proceedings of the above-mentioned prior art that the problem to be solved by the invention in respect to said closest prior art was to increase the component of the clamping force for the cutting insert in direction towards the base surface in the insert-receiving side of the cutting insert holder, maintaining the advantage of the known cutting tool of quick removal of the cutting insert without removing the locking screw from the cutting insert holder.

4.2 According to the teaching of Claim 1, this problem is solved by bending the screw's head relative to the longitudinal axis of the locking screw, by providing at the

same time an unsymmetrical cross-section of the screw's head with respect to its own longitudinal axis and by inclination towards the contact point, when the locking screw is mounted. This enables the constructor to widen the inclination angle of the cone considerably and thereby to increase the component of the clamping force towards the base surface without losing the quick removal capability.

- 4.3 The question is whether the modifications are suggested anywhere in the cited art:

The document "Draft Proposal ISO/DP 6987 E" concerns cutting inserts with partly cylindrical fixation hole dimensions. The purpose of this document is the standardisation of these cutting inserts. The skilled person only learns from it to give the hole a certain curviligned profile in order to be fitted with countersunk screws having head taper angles between 40° and 60°. As it can be seen from Figure 1, the longitudinal axes of the head and the rest of the countersunk screw coincide. From this results a centric positioned head with a symmetrical cross-section and, therefore, a circumferential line contact (cf. also page 4, first paragraph) between the contact surfaces of the hole and the head.

Consequently, the aforementioned document does not give any hint to the skilled person to concentrate the clamping force component, which is directed towards the base surface, in a contact point by bending the head in such a manner that the component is increased which, in turn, serves to improve the seating of the positive cutting insert on the base surface of the cutting insert holder. It cannot be seen, therefore, any reason to combine the device as shown in Figure 1 of the aforementioned document with the cutting insert holder in a cutting tool according

to DE-A-2 164 496 if the problem to be solved is to increase the clamping force directed towards the base surface.

- 4.4 Figure 3 of US-A-3 341 923 discloses, in combination, the features mentioned in the first part of Claim 1 (cf. EP-B-0 052 585, column 2, lines 4 to 32). However, the absence of joint contact in this document, in addition to the missing bent head and unsymmetric cross-section render the document less relevant than DE-A-2 164 496 as a starting point, and also unsuitable to find the feature which modified the latter state of the art.
- 4.5 From the Figures 2 to 4 of the DE-A-2 359 059, the skilled person learns to provide only a bent lever to clamp a cutting insert on a cutting insert holder.

This document as well as the other documents cited in the proceedings before the European Patent Office, to which the Respondents did not refer during the proceedings before the Board of Appeal, give likewise no hint of the subject-matter of Claim 1. Their teaching could, therefore, neither per se nor in combination with the teachings of the documents discussed in the foregoing paragraphs lead the skilled person to the cutting tool according to Claim 1.

- 4.6 The subject-matter of Claim 1 involves also an inventive step within the meaning of Article 56 EPC.
5. Hence, the patent can be maintained with Claim 1 in the wording as amended together with the Claims 2 to 7 as granted, which are directed to special embodiments of Claim 1.

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 European patent on the basis of the following documents:
 - Claim 1 filed on 26 July 1989
 - Claims 2 to 7, description and drawing as granted.

The Registrar:

The Chairman:

S. Fabiani

S. Fabiani

G. Szabo
G. Szabo

HS 13.09.89

W Moser 13.9.89

03257