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Datasheet for the decision of 2 February 2017

Case Number: T 0863/14 - 3.2.08

Application Number: 06765199.2

Publication Number: 1926567

IPC: B23B51/02

Language of the proceedings: EN

Title of invention:
TWIST DRILL

Patent Proprietor:
Dormer Tools Limited

Opponent:
Iscar Ltd.

Headword:

Relevant legal provisions:
EPC Art. 56, 84
RPBA Art. 13(3)

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It can be changed at any time and without notice.

Keyword:
Inventive step - main request (no) - auxiliary request 3 (yes)
Claims - clarity (yes)
Late-filed request - adjournment of oral proceedings would have been required (yes)

Decisions cited:

Catchword:

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Case Number: T 0863/14 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 2 February 2017

Appellant: (Opponent)	Iscar Ltd. P.O. Box 11 24959 Tefen (IL)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstrasse 3 81675 München (DE)
Respondent: (Patent Proprietor)	Dormer Tools Limited Advanced Manufacturing Park Morse Way Waverley Sheffield S60 5BJ (GB)
Representative:	Webster, Jeremy Mark Mewburn Ellis LLP City Tower 40 Basinghall Street London EC2V 5DE (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 10 March 2014 rejecting the opposition filed against European patent No. 1926567 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chair	P. Acton
Members:	M. Foulger
	Y. Podbielski

Summary of Facts and Submissions

I. With the decision dated 10 March 2014, the opposition division rejected the opposition against the European patent no. 1 926 567.

II. The appellant (opponent) filed an appeal against this decision. The notice of appeal and the statement setting out the grounds of appeal were filed in the correct form and within the given time limits.

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

IV. The respondent requested that the appeal be dismissed, or in the alternative that the patent be maintained in amended form on the basis of one of the sets of claims filed as auxiliary requests 1-5 with the letter dated 5 December 2014, or auxiliary request 6 filed with the letter dated 7 November 2016, or auxiliary request 3A filed during the oral proceedings.

V. Oral proceedings took place before the Board on 2 February 2017.

VI. Claim 1 of the main request reads as follows:

"A twist drill having
a shank,
an axis of rotation about which the twist drill rotates during use, and
a cutting tip (51), the cutting tip having a cutting edge, wherein an inner cutting portion (55, 57) of the cutting edge forms a point (18), a radially outer part of the cutting edge including
an outer cutting portion (59, 61) that is inclined in

the opposite axial direction to the inner cutting portion at an angle (B) of from 2° to 8° with respect to a plane normal to the axis of rotation,
wherein the cutting edge is continuous and the point and the cutting portion are joined such that a V-shaped valley or trough is formed between the point and the outer cutting portion; and a cylindrical land (13) wherein the outer cutting portion extends to the outermost edge of the cylindrical land, **characterised in that** the point angle (A) is in the range of 128° to 160°."

Auxiliary request 1:

The final feature of the preamble of claim 1 has been modified as follows (additions underlined):

"wherein the outer cutting portion that is inclined in the opposite axial direction to the inner cutting portion extends at said angle (B) of from 2° to 8° with respect to a plane normal to the axis of rotation to the outermost edge of the cylindrical land,"

Auxiliary request 2:

The following feature has been added with respect to the main request:

"wherein the twist drill is made of tungsten carbide, or wherein the twist drill comprises polycrystalline diamond mounted on a metal substrate."

Auxiliary request 3A

The feature "suitable for drilling laminate material comprising a fibre-containing layer and a metal

containing layer" has been added after "twist drill" in the first line of claim 1 according to the main request.

Auxiliary request 3:

The following feature has been added with respect to the main request:

"wherein when the cutting tip is viewed axially the outer cutting portion forms an angle, in the radial direction, with the inner cutting portion such that the outer cutting portion extends in front of the inner cutting portion in the cutting direction of the twist drill."

The remaining auxiliary requests are not relevant for this decision.

VII. The following documents are referred to in this decision:

E2: US 6,113,321 A
E5: DE 101 06 035 A1
E31A: R.H.Todd, D.K.Allen, L.Alting, "Manufacturing Processes Reference Guide", Industrial Press Inc., p.46
E31: US 5,078,554 A
E32: E.Oberg, F.D.Jones, H.L.Horton, H.H.Ryffel, "Machinery's handbook 25th Edition", Industrial Press Inc., 1996, p.825

VIII. The appellant argued essentially the following:

a) Admittance of E31A and E32 into the proceedings

E31A and E32 should be admitted into the proceedings

because they merely reflected the common general knowledge of the skilled person.

b) Main request

E2 disclosed at least the features of the preamble of claim 1. Moreover, E2, col. 1, l. 44-46, explicitly disclosed a point angle range of between about 121° and about 127°. The use of "about" indicated clearly that the range was intended to extend past 127° by a certain amount and thus encompassed the claimed 128°. Furthermore, when manufacturing tolerances of +/- 2° were applied to this disclosure then this would fall within the ambit of the claimed range, i.e. 128° to 160°.

There was no disclosure in the patent of any synergetic effect between the various features of claim 1. There was moreover no indication of why the claimed range of point angles should be preferred and no disclosure of what advantage the claimed range of point angles should offer. It was also to be noted that the claim did not specify which material was to be drilled.

Therefore the problem to be solved was merely to provide an appropriate point angle for the material to be drilled.

E31A showed that the claimed point angles were in the ranges commonly used. E2 moreover taught using flatter angles compared with the prior art (see E2, col. 1, l. 46-48), the skilled person would therefore have been motivated to further modify the teaching of E2 and to arrive at the subject-matter of claim 1 with a reasonable expectation of success.

c) Auxiliary request 1

The above arguments also applied to auxiliary request 1.

d) Admissibility of auxiliary requests 2 and 3

The subject-matter of claim 1 of auxiliary request 2 and, indeed, auxiliary request 3 diverged from that of the previous requests. Thus these requests should not be admitted into the proceedings.

e) Auxiliary request 2 - inventive step

The subject-matter of claim 1 differed from the twist drill disclosed in E2 in that:
- the point angle was in the range of 128° to 160°,
- the twist drill was made of tungsten carbide, or comprises polycrystalline diamond mounted on a metal substrate.

This was merely a juxtaposition of features without any synergetic effect.

As discussed above the first feature did not involve an inventive step. The second feature provided a harder drill and thus contributed to improve the drill life. It was however generally known that a harder material would have the desired effect of improving drill life. The use of a known material to achieve a known and foreseeable effect would have been obvious for the skilled person.

f) Auxiliary request 3A

This request was filed at an extremely late stage of

the appeal proceedings, i.e. during the oral proceedings. It involved features taken from the description which raised new issues regarding clarity and added subject-matter. Moreover these features had not been searched and should this request be admitted into the proceedings, then the proceedings should be adjourned. This request should not, therefore, be admitted into the proceedings.

g) Auxiliary request 3

i) Clarity

The claim did not specify where the angle was formed. The claim was therefore ambiguous.

ii) Inventive step - E2 as closest prior art

The subject-matter of claim 1 differed from the twist drill disclosed in E2 in that:
- the point angle was in the range of 128° to 160°
and in that:
- when the cutting tip was viewed axially the outer cutting portion formed an angle, in the radial direction, with the inner cutting portion such that the outer cutting portion extended in front of the inner cutting portion in the cutting direction of the twist drill.

As discussed above, the first of these characterising features did not involve an inventive step. There was no synergy between the two features - these features amounted to a mere juxtaposition. Moreover the second characterising feature was made obvious by the teaching of E31, E5 or common general knowledge.

Hence, the subject-matter of claim 1 did not involve an inventive step in view of E2 as closest prior art.

iii) Inventive step - E5 as closest prior art

The subject-matter of claim 1 differed from the twist drill disclosed in E5 merely in that the outer cutting portion was inclined at angle of 2° to 8° with respect to a plane normal to the axis of rotation.

The problem to be solved was therefore to select an appropriate angle of inclination for the outer cutting portion.

The skilled person would have selected an appropriate angle of inclination of the outer cutting portion in accordance with the material to be drilled. In this respect E2 already provided a hint to choose this angle.

The skilled person would not, therefore, have had to use inventive activity in order to arrive at the subject-matter of claim 1. Hence, the subject-matter of claim 1 did not involve an inventive step in view of E5 as closest prior art.

iv) Independent claims 13 and 15

The above arguments applied equally to these claims.

IX. The respondent argued essentially the following:

a) Admittance of E31A and E32 into the proceedings

E31A and E32 were filed late and thus should not be admitted into the proceedings.

b) Main request

E2 disclosed the preamble of claim 1. The characterising feature of claim 1 was not known from E2 because E2 disclosed a preferred value of 124° within a range 121°-127°. Thus, a maximum value of 127° was disclosed which differed from the claimed range. Although E2 disclosed "about 127°" this could not be taken as allowing values as high as 128°.

The claimed shape and specific range of point angles of the drill provided a synergetic effect. Hence, the problem to be solved was to provide a drill showing minimum metal burr height and low levels of fraying and crown burring for composite materials whilst minimising delamination and providing good tool life.

There was no hint in either E2 itself, or the common general knowledge that would lead the skilled person to the subject-matter of claim 1. Moreover, E31A did not mention laminates and although E2 may well be structurally the closest to the claimed drill, this document did not make any mention of laminates either.

Thus, the subject-matter of claim 1 involved an inventive step.

c) Auxiliary request 1

The above arguments also applied to auxiliary request 1.

d) Admissibility of auxiliary requests 2 and 3

It was true that the requests were diverging. However

the requests were limited in number and were filed at the earliest possible moment in appeal proceedings, i.e. with the reply to the appeal. The requests should therefore be admitted into the proceedings.

e) Auxiliary request 2 - Inventive step

The subject-matter of claim 1 was further limited over the disclosure of E2 in that the twist drill was made of tungsten carbide, or in that the twist drill comprised polycrystalline diamond mounted on a metal substrate.

The added feature had the technical effect of extending drill life. Thus, it contributed in a synergetic way to the problem to be solved identified for the main request.

Given that E2 related to a drill intended for the lower end of the market there was no indication for the skilled person to use relatively expensive materials for the drill. Moreover E2 did not suggest that drill life was a problem.

Thus, the subject-matter of claim 1 involved an inventive step.

f) Auxiliary request 3A

This request was filed to take account of comments made by the Board during the oral proceedings. It merely reflected the overall thrust of the invention disclosed in the patent and as such did not necessitate any further search.

g) Auxiliary request 3

i) Clarity

The angle was formed by the inner cutting edge and the outer cutting edge. Thus the position of the angle was unambiguously defined in the claim. The terms radial direction and cutting direction were well known in the art and did not therefore introduce any unclarity.

Thus, the claims fulfilled the requirements of Article 84 EPC.

ii) Inventive step - E2 as closest prior art

The subject-matter of claim 1 differed from the twist drill of E2 in that:

- the point angle was in the range of 128° to 160°
- when the cutting tip was viewed axially the outer cutting portion formed an angle, in the radial direction, with the inner cutting portion such that the outer cutting portion extended in front of the inner cutting portion in the cutting direction of the twist drill.

The technical effect of the second of these features was to reduce burr height.

E31 did not disclose inner and outer cutting portions as defined in the claim. Therefore there was no disclosure of an angle between the two cutting portions. Consequently even taking E31 into consideration, the skilled person would not have arrived at the subject-matter of claim 1. Moreover,

this second characterising feature could not be regarded as being part of the common general knowledge because there was no evidence of this. E5 taught away from the claimed subject-matter, see below, and although it may show the feature it did not attribute any advantageous effect to it.

Thus, the subject-matter of claim 1 involved an inventive step considering E1 as closest prior art.

iii) Inventive step - E5 as closest prior art

The subject-matter of claim 1 differed from the twist drill disclosed in E5 in that the outer cutting portion was inclined at an angle of 2° to 8° with respect to a plane normal to the axis of rotation. E5 taught however that the above angle should be 11° which was advantageous because it provided a more aggressive cutting performance (paragraph [0004]) and entered easily into the material to be machined (paragraph [0007]). A flatter angle as presently claimed would run against this teaching and hence would not have been obvious for the skilled person.

Thus, the subject-matter of claim 1 involved an inventive step considering E5 as closest prior art.

iv) Independent claims 13 and 15

The above arguments applied equally to these claims.

Reasons for the Decision

1. Admittance of E31A and E32 into the proceedings

The admittance of documents E31A and E32 lies within the Board's discretion (Art. 114 EPC). These documents were extracts from textbooks illustrating the skilled person's common general knowledge about twist drills; an issue that was at dispute between the parties. The documents were thus relevant. The documents were presented at a relatively early point in the proceedings with the appellant's submissions dated 5 November 2015. The introduction of these documents would also not have caused procedural complications or delays. The Board thus decided to admit documents E31A and E32 into the proceedings.

2. Main request

It is common ground that E2 discloses a twist drill with at least the features of the preamble of claim 1. The drill bit disclosed in E2 has a point angle of up to 127° (col. 1, l. 45). E2 does not disclose that manufacturing tolerances should be used to extend this end point but rather specifies a preferred value of 124° (col. 1, l. 46) and then a range about this value - 121° to 127°. There is no disclosure of any values outside this range. Moreover the term "about" cannot be taken as an extension of the disclosed range up to 128°. Thus the feature of the characterising part of claim 1 is not known from E2.

The subject-matter of claim 1 therefore differs from the drill bit disclosed in E2 in that the point angle is in the range of 128° to 160°.

The difference between the end points of the ranges of the prior art E2 and that claimed is merely 1°.

The following objective technical problem was proposed by the respondent: to provide a drill bit showing minimum burr height and low levels of fraying and crown burring for composite materials whilst minimising delamination and providing good tool life.

The Board is not, however, persuaded that this problem is justified by the 1° difference in the point angle compared with the prior art. For example, the problem of fraying is related to the form of the outer cutting portion rather than the point angle.

The objective problem to be solved is therefore to select an appropriate point angle for the material to be drilled.

The skilled person knows from their common general knowledge that, for different materials, different point angles are necessary. For example E31A discloses various ranges such as 90° to 135° for aluminium or 118° to 135° for stainless steel. It would therefore be an obvious design choice for the skilled person to adapt the point geometry of the drill bit of E2 in accordance with the material to be drilled.

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

3. Auxiliary request 1

It is common ground that the same arguments as for the

main request apply to this request which is, therefore, also not allowable for the reasons set out above.

4. Admissibility of auxiliary requests 2 to 5

It is true that the requests were diverging. However, the requests are limited in number and were filed as a legitimate attempt to overcome the objections raised by the appellant. They were filed at the earliest possible moment in appeal proceedings, i.e. with the reply to the appeal. Hence, auxiliary requests 2 to 5 were admitted into the proceedings.

5. Auxiliary request 2 - Inventive step

E2 is considered to represent the closest prior art. It has not been disputed that this document discloses the features of the preamble of claim 1.

The subject-matter of claim 1 therefore differs from this known drill bit in that:
- the point angle is in the range of 128° to 160°,
- the twist drill is made of tungsten carbide, or comprises polycrystalline diamond mounted on a metal substrate.
There is no evidence that the characterising features mutually influence each other to achieve any effect that goes beyond that of the features acting alone. Thus these features are to be regarded as a mere juxtaposition and may be treated separately.

The first distinguishing feature has been discussed above with relation to the main request.

The latter feature solves the technical problem of improving drill life.

It is true that E2 concerns roll-forged drill bits which tend to be from the "lower end of the market" (col. 1, l. 1-9). However, E2, col. 2, l. 60 also mentions that life expectancy of the drills is an issue. Thus, the skilled person would still seek to improve drill life.

The skilled person knows that harder materials would lead to longer drill life. Moreover, from their common general knowledge, the skilled person is aware of materials such as tungsten carbide or polycrystalline diamond mounted on a metal substrate.

In order to extend the drill life the skilled person would have, with a reasonable expectation of success and without the exercise of inventive activity, chosen a harder material, such as tungsten carbide or polycrystalline diamond mounted on a metal substrate.

Hence, the subject-matter of claim 1 does not involve an inventive step.

6. Auxiliary request 3A

This request was filed during the oral proceedings before the Board. According to Article 13(1) RPBA its admission into the proceedings is at the discretion of the Board. The request is based on claim 1 as granted together with the feature, taken from the description, "suitable for drilling laminate material comprising a fibre-containing layer and a metal containing layer".

This request raises new issues with respect to Articles 56, 84 and 123(2) EPC. To deal with these new issues, the Board and the appellant would have required an

adjournment of the oral proceedings. Therefore this request was not admitted into the proceedings (Article 13(3) RPBA).

7. Auxiliary request 3

7.1 Clarity

Claim 1 is unambiguous because it clearly requires that the angle is formed by the outer cutting portion and the inner cutting portion. The references in the claim to the radial direction and the cutting direction are clear to the skilled person in the field of machine tools.

Hence, claim 1 meets the requirements of Article 84 EPC.

7.2 Starting from E2 as closest prior art:

It is undisputed that the subject-matter of claim 1 differs from the drill bit disclosed in E2 in that:
- the point angle is in the range of 128° to 160°
and in that:
- when the cutting tip is viewed axially the outer cutting portion forms an angle, in the radial direction, with the inner cutting portion such that the outer cutting portion extends in front of the inner cutting portion in the cutting direction of the twist drill.

The problem to be solved by the second distinguishing feature is to reduce fraying of the sides of the hole.

It is true that E31 seeks to solve the above problem by providing an angle in the cutting edge. However E31

contains no indication that the angle should be located between the inner cutting portion and the outer cutting portion as defined in the claim.

Thus even considering E31 would not lead the skilled person to the subject-matter of claim 1 without an inventive step being involved.

It is true that E5 discloses the second distinguishing feature - see Fig. 3, parts 12 and 14. However, E5 does not attribute any technical effect to this arrangement and therefore the skilled person would not have had any motivation to apply this to the drill known from E2. Moreover, as discussed below, E5 teaches away from the claimed invention because it teaches that the outer cutting portion should be at an angle of 10° to 15°. Thus the skilled person would not select a feature from E5 which has no advantageous effect ascribed to it and ignore the feature which is described as advantageous. Hence, considering the teaching of E5 in combination with that of E2 would not lead to the subject-matter of claim 1 without an inventive step being involved.

There was no evidence presented that the second distinguishing feature belonged to the common general knowledge. Therefore even considering the common general knowledge would not have lead the skilled person to the subject-matter of claim 1 without an inventive step being involved.

7.3 Starting from E5 as closest prior art:

It is common ground that the subject-matter of claim 1 differed from this document in that the outer cutting portion is inclined at an angle of 2° to 8°.

The effect of the outer cutting portion shown in E5 ("Schulter" 14 - see paragraph [0004]) is that an aggressive cutting performance of the drill can be achieved (col. 1, l. 33-34). Thus reducing the angle of the outer cutting portion from the 10° to 15° disclosed in E5 would run contrary to the teaching of this document, as exemplified in [0004], because it would result in a less aggressive cutting performance. The skilled person would therefore not carry out this modification without an inventive step being involved.

7.4 For the same reasons independent claims 13 and 15 also involve an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent in amended form on the basis of the following documents:

   - Claims 1 to 18 according to auxiliary request 3 filed with the reply to the statement of grounds of appeal;

   - Description: columns 1,2,3,4,9,10 and 12 of the patent specification as granted and columns 5,6,7,8 and 11 as filed during the oral proceedings on 2 February 2017;

   - Drawings 1A-5B of the patent specification as granted.

The Registrar: The Chair:

C. Moser P. Acton

Decision electronically authenticated