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**Datasheet for the decision
of 22 September 2016**

Case Number: T 1696/12 - 3.2.08

Application Number: 02766718.7

Publication Number: 1383623

IPC: B23G5/06

Language of the proceedings: EN

Title of invention:

A THREAD CUTTING TAP AND A METHOD OF ITS MANUFACTURE

Patent Proprietor:

Sandvik Intellectual Property AB

Opponent:

Iscar Ltd

Headword:

Relevant legal provisions:

EPC Art. 54, 56

RPBA Art. 12(4), 13(1)

Keyword:

Novelty

Inventive step

Decisions cited:

Catchword:



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Case Number: T 1696/12 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 22 September 2016

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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on
15 May 2012 concerning maintenance of the
European Patent No. 1383623 in amended form.

Composition of the Board:

Chairwoman P. Acton
Members: M. Alvazzi Delfrate
D. T. Keeling

Summary of Facts and Submissions

- I. By its decision posted on 15 May 2012 the opposition division found that European patent No. 1 383 623, in amended form according to auxiliary request 2 then on file, and the invention to which it related met the requirements of the EPC.
- II. Both the patent proprietor (appellant 1) and the opponent (appellant 2) lodged an appeal against this decision in the prescribed form and within the prescribed time limit.
- III. Oral proceedings before the Board of Appeal were held on 22 September 2016.
- IV. Appellant 1 requested that the opponent's appeal be dismissed and that the decision under appeal be set aside and that the patent be maintained as granted or, in the alternative, that the patent be maintained on the basis of one of the first to fourth auxiliary request filed with letter of 14 February 2013 or the fifth auxiliary request filed at the oral proceedings.
- Appellant 2 requested that the decision under appeal be set aside and that the patent be revoked.
- V. Independent claims 1 and 13 of the **main request** read as follows:

"1. A thread cutting tap having an elongated body, comprising at a first end a connector portion (4) adapted to be connected to a tool and at a second end a threaded portion (6) for cutting out a thread in a wall of an opening into which said threaded portion is to be introduced, said threaded portion (6) being provided

with at least two cutting edges (15) in the circumferential direction of said body, each of said cutting edges (15) being an integral peripheral part of a flank portion (10) extending substantially radially from the longitudinal extension of said body, said flank portions (10) defining them between a chip removal flute (12, 13, 14) in the longitudinal extension of said body for removal of chips cut from said wall, wherein at least one of said flank portions (10) having a side-wall (17, 19, 21), is provided with a chip-breaking member (22), characterised in that said chip removal flutes (12, 13, 14) are at least partly helically shaped."

"13. A method of manufacturing a thread cutting tap including

- selecting an elongated blank having an elongated body with a first and a second end
- forming at least one thread having a cutting edge (15) at its circumferential periphery at an end portion of said blank
- forming at least two chip removal flutes (12, 13, 14) traversing said thread, such that a flank (9, 10, 11) portion having a side-wall is formed between two neighbouring flutes,
- forming in a side-wall (17, 19, 21) of said flank portions at least one chip-breaking member (22), characterised by forming said chip removal flutes to an at least partly helical shape."

The first auxiliary request comprises two independent product claims (1 and 2) and two independent process

claims (10 and 11). Claim 1 comprises the following additional features with respect to claim 1 as granted:

"wherein said chip removal flutes (12, 13, 14) are helically shaped over substantially their whole length, characterised in that the angle (α) between the axial extension of the body and the extension of each of said chip removal flutes is 10°- 25°."

Claim 10 has been amended correspondingly.

Claim 2 comprises the following additional features with respect to claim 1 as granted:

"wherein said chip removal flutes (12, 13, 14) are partly straight and partly helically shaped, said helically shaped flutes being arranged closest to the second end characterised in that the angle (α) between the axial extension of the body and the extension of each of chip removal flutes is 1°-15°."

Claim 11 has been amended correspondingly.

Each of independent claims 1, 2, 7 and 8 of the **second auxiliary request** comprises with respect to the corresponding claims 1, 2, 10 and 11 of the first auxiliary request the additional features according to which

"said side-wall (17, 19, 21) is divided into a pair of elongated concave surfaces separated by an elongated ridge (22) constituting a chip-breaking member (22), wherein the elongated ridge (22) is an edge formed by the immediate interconnection of said concave surfaces"

The third and the fourth auxiliary requests correspond to the first and second auxiliary requests limited to the first independent product and the first independent process claim.

The fifth auxiliary request correspond to the second auxiliary request limited to the second independent product and the second independent process claim.

VI. The following documents played a role for the present decision:

E0: JP -A- 2 100819 (together with abstract E0a and translation E0b);

E2: US -A- 3,328,814;

E3: EP -B- 0 641 620;

E4: US -A- 2,145,819;

E5: US -A- 2,121,380;

E22: CN 2202606Y (with abstract E22a and translation E22').

VII. The arguments of appellant 1 can be summarised as follows:

Introduction into the proceedings of E0b, E22

There was no reason to admit late-filed documents E0b and E22 into the proceedings. Neither of these documents was prima facie relevant. In particular, E22 did not clearly disclose a chip-breaking element and was thus no more relevant than E3, which was already in the proceedings. Hence, E0b and E22 were to be disregarded.

Main request

The subject-matter of claim 1 of the main request was novel, in particular in respect of E0. It was true that Figure 3 of E0 showed a change in the radius of curvature of the surface of the flute. However, there was no disclosure that this shape applied also in the case of helical flutes, given that E0 related to taps with straight flutes. Moreover, the change of radius of the flutes of E0 could not be considered a chip-breaking member, because the term "member" rather implied a distinct element, such as the ridge of the patent in suit. Therefore, E0 did not disclose all the features of claim 1 of the main request.

First auxiliary request

The subject-matter of claim 1 of the first auxiliary request was novel, in particular in view of E22. This document did not disclose that the change in curvature of the shape of the flutes shown in Figure 2 provided a chip-breaking effect. Hence, E22 did not disclose a chip-breaking member, as stipulated by claim 1 of the first auxiliary request.

Second auxiliary request

In addition to the features already discussed for the first auxiliary request, the subject-matter of claim 1 of the second auxiliary request was further distinguished from E22 by the provision of a ridge between the concave surfaces, a feature that neither the drawings nor the description of E22 disclosed. In particular, the straight line mentioned in the description was not described as representing such a

ridge. Accordingly, the subject-matter of claim 1 was novel.

Moreover, that subject-matter also involved an inventive step. Starting from the closest prior art E4 the problem solved by the claimed invention, by means of the helical-shaped flutes, was the provision of a thread cutting tap with improved transport of the chips.

E4 would have dissuaded the person skilled in the art from looking at taps with non-straight flutes, because this would have impaired the functioning of the chip-breaking member due to an unfavourable contact angle between the chips and said member.

Moreover, the problem of chip transport did not figure among the objects of the invention of E3, which were disclosed on column 1, lines 44 to 57. Hence, even when considering the helical flutes shown in E3, the person skilled in the art would not have considered that said flutes could be used to solve the given problem.

Third and fourth auxiliary request

The arguments made for claim 1 of the first and second auxiliary requests applied also to claim 1 of respectively the third and fourth auxiliary requests.

Fifth auxiliary request

The independent claims of the fifth auxiliary request were already present as independent claims in the second auxiliary request, such that appellant 2 had the possibility of objecting said independent claims in the

written procedure. Therefore, the fifth auxiliary should be admitted into the proceedings.

Moreover, the subject-matter of this request was novel, in particular in view of E5, and involved an inventive step, in particular starting from E4.

In the tap shown in E5 the flutes were not helically shaped as required by claim 1 and the condition on the angle (α) was also not satisfied. Thus, E5 could not be novelty-destroying.

Starting from the closest prior art E4 the problem solved by the claimed invention, by means of the geometry of the flutes, was the provision of a thread cutting tap with improved transport of the chips. The person skilled in the art would not consider E2 to solve this problem because the object discussed on column 1, lines 63 to 72 of this document was a different one. In any event the skew formation shown in E2 was not a helically shaped flute. Thus, the combination of E4 and E2 did not lead to the claimed tap. Therefore, the subject-matter of claim 1 involved an inventive step.

VIII. The arguments of appellant 2 can be summarised as follows:

Introduction into the proceedings of E0b, E22

E0b was merely the translation of document E0, which was already in the proceedings. E22 was *prima facie* relevant, as can be derived by the drawings and the abstract. Hence, both E0b and E22 should be admitted into the proceedings.

Main request

E0 disclosed a thread cutting tap with all the features of claim 1. In particular, the change of curvature radius of the wall of the flutes, which was clearly visible in Figure 3, acted as a chip-breaking member, as described on page 102 of E0b. Nothing more was required by claim 1, which did not define the geometry of said member. Finally it was apparent, *inter alia* from the reference numbers used in the drawings, that this change of curvature was to be applied both to the embodiments with straight and spiral flutes. As a consequence, the subject-matter of claim 1 of the main request lacked novelty in view of E0.

First auxiliary request

E22 disclosed all the features of claim 1 of the first auxiliary request. Even if not explicitly disclosed, the chip-breaking effect of the change of radius in the wall of the flute as shown in Figure 2 was an inherent result of this geometry. Hence, the subject-matter of claim 1 lacked novelty in view of E22.

Second auxiliary request

E22 disclosed also the features added in claim 1 of the second auxiliary request. On page 3, penultimate paragraph, this document described that the flute shape could exhibit two circular arcs and one straight line, i.e. a ridge. Accordingly, the subject-matter of claim 1 was not novel in view of E22.

In any event said subject-matter did not involve an inventive step when starting from E4. The problem solved by the claimed invention starting from this

document was the provision of a thread cutting tap with improved transport of the chips. The person skilled in the art would not have limited himself to documents concerning thread taps with straight flutes when looking for a solution for this problem. Therefore, he would have taken into consideration document E3, relating to threading taps and discussing, on column 3, lines 32 to 45, the most favourable geometries of the flutes for improving the transport of the chips. The fact that further objects to be achieved by the rake angle and the coating material were also described in this document was immaterial. E3 taught that helically shaped flutes, in particular with an angle as claimed, were advantageous for the removal of chips. Therefore, E3 rendered it obvious to arrive at the subject-matter of claim 1 starting from E4.

Third and fourth auxiliary request

The arguments submitted for the first and second auxiliary requests applied in respect of the third and fourth auxiliary requests as well.

Fifth auxiliary request

The fifth auxiliary request was filed at the oral proceedings before the Board, i.e. at a very late stage of the proceedings, without good reason. Hence, it should not be admitted into the proceedings.

In any event, its subject-matter lacked novelty in view of E5, which disclosed a tap with all the features of claim 1. In particular, in view of the tapered termination of the cutting edges of the teeth provided by the auxiliary grooves 15, the chip removal flutes of E5 were partly helically shaped, as required by claim

1. Moreover, since the angle of this taper varied from 0° to a given value at the end of the tap, which was certainly greater than 1°, at some point it assumed a value in accordance with the claim. That the termination of the flutes of E5 was to be regarded as helically shaped in the sense of the patent was clear when comparing Figure 1 of E5 with Figures 3A and 3B of the patent in suit, which showed flutes with a similar geometry.

Additionally, the claimed tap was also obvious starting from E4. The problem to be solved was the provision of a thread cutting tap with improved transport of the chips. Looking for a solution the person the person skilled in the art would have considered E2, which disclosed a tap with flutes exhibiting a skew formation, whose function was to break up and transport the chips. This skew formation, also called "spiral point" in column 1, line 16, and depicted in Figures 1 and 2, could be regarded as a partly helical flute, as defined in claim 1. Hence, the subject-matter of claim 1 did not involve an inventive step in view of the combination of E4 and E2.

Reasons for the Decision

1. Introduction into the proceedings of E0b, E22

Both E0b and E22 had been submitted in opposition proceedings and were not admitted by the opposition division.

E0b and E22 were re-submitted at the earliest possible moment in appeal together with the statement of grounds of appeal of appellant 2. Hence, their introduction in the appeal proceedings is within the discretionary power of the Board (Article 12(4) RPBA).

Moreover, E0b is not a new document but merely the translation of document E0, which is a document filed within the nine-month opposition period. As to E22, it clearly shows a tap with helically shaped flutes, i.e. the features according to the characterising portion of granted claim 1, and having an angle in accordance with the preferred range of the patent in suit, in order to provide an improved transport of the chips (see abstract). Hence, its relevance is *prima facie* apparent.

Under these circumstances, the Board decided to admit E0b and E22 (and its translation) into the proceedings.

2. Main request

It is undisputed that E0 (reference is made to the translation E0b) discloses a thread cutting tap having an elongated body, comprising at a first end a connector portion (6) adapted to be connected to a tool and at a second end a threaded portion for cutting out a thread in a wall of an opening into which said threaded portion is to be introduced, said threaded portion being provided with at least two cutting edges (1) in the circumferential direction of said body, each of said cutting edges being an integral peripheral part of a flank portion extending substantially radially from the longitudinal extension of said body, said flank portions defining them between a chip removal

flute (2) in the longitudinal extension of said body for removal of chips cut from said wall (see drawings).

The gist of the invention of E0 resides in the provision in the side-wall of the flank portions of a second arc surface with smaller curvature radius (see page 102 "Means to resolve issues"). Hence, it is clear that the change of curvature radius of the wall of the flutes, which is shown in detail in Figure 3, is to be applied to both the embodiments considered by E0: a tap with spiral flutes as shown in Figure 1 and a tap with straight flutes as shown in Figure 2. This is further corroborated by the fact that the reference numbers in Figure 3 refer to both the spiral flutes 2 of Figure 1 and the straight flutes 2a of Figure 2.

In the paragraph describing the "Operation" (see page 102) of the invention E0 states that pieces of cutting debris scraped out by biting tips of the tap are rapidly and forcibly curled by the second arc surface with a small curvature radius; as they curl, the pieces of cutting debris crack and break into small pieces. Hence, even if it is true that the flutes of a tap always break the chips to some extent, a specific chip-breaking action is provided by the adoption of two different radii of curvature.

The term "chip-breaking member" in present claim 1 merely defines a part of the side-wall that provides the chip-breaking effect and does not necessarily refer to a ridge as in the preferred embodiments of the patent. This is supported not only by the fact that only granted dependent claim 2 specifies that the member is constituted by said ridge, but also by the discussion of the prior art in paragraph [0004] of the patent specification, which considers also other

geometries, such as an indentation in the wall, as a chip-breaking member. Therefore, the change of radius is a feature of the side-wall which can be regarded as a "chip-breaking member".

Hence, the subject-matter of claim 1 of the main request lacks novelty in view of E0.

3. First auxiliary request

E22 discloses, in the abstract and the drawings, a thread cutting tap (abstract) having an elongated body, comprising at a first end a connector portion adapted to be connected to a tool (Figure 1) and at a second end a threaded portion for cutting out a thread in a wall of an opening into which said threaded portion is to be introduced, said threaded portion being provided with at least two cutting edges in the circumferential direction of said body, each of said cutting edges being an integral peripheral part of a flank portion extending substantially radially from the longitudinal extension of said body (see drawings), said flank portions defining them between a chip removal flute (4) in the longitudinal extension of said body for removal of chips cut from said wall. E22 also discloses that the chip removal flutes are helically shaped over substantially their whole length (see Figure 1) and that the angle (θ) between the axial extension of the body and the extension of each of said chip removal flutes is in the range between 10° and 25° (see abstract, disclosing an angle between 12° and 20°).

According to the description the shape of the flute can be one circular arc, two straight lines and one circular arc, or two circular arcs and one straight line (E22', page 3, penultimate paragraph). In Figure 2

an embodiment is shown wherein a change in the curvature radius is present, i.e. the flute has the shape of two circular arcs. It is true that E22 does not explicitly describe the effect of this shape. However, said change of radius inherently provides, as evidenced by E0 (see point 2 above), a chip-breaking effect. Hence, the part of the wall of the flutes of E22 wherein there is a change in radius inherently is a chip-breaking member.

Therefore, E22 discloses a tap with all the features of claim 1 of auxiliary request 1. Accordingly, the subject-matter of said claim lacks novelty.

4. Second auxiliary request

In respect of the second auxiliary request appellant 2 raised objections of lack of novelty (in view of E22) and inventive step (in view of the combination of E4 and E3) of the subject-matter of claim 1.

4.1 Novelty

Figure 2 of E22 does not show a ridge separating the two concave surfaces with the two different curvature radii. It is true that the description refers, as one of the possible shapes for the flute, to two circular arcs and one straight line (E22', page 3, penultimate paragraph). However, there is no clear and unambiguous disclosure that said straight line is a ridge separating the two circular arcs, since a straight line may represent a flat surface.

Therefore, E22 does not disclose that the side-wall is divided into a pair of elongated concave surfaces separated by an elongated ridge constituting a chip-

breaking member, as stipulated by claim 1 of the second auxiliary request. Accordingly, the subject-matter of said claim is novel.

4.2 Inventive step

4.2.1 E4 (which is cited in paragraph [0003] of the patent in suit) undisputedly represents the closest prior art for assessing the inventive step of claim 1 of the second auxiliary request.

E4 shows in the drawings a thread cutting tap having an elongated body, comprising at a first end a connector portion adapted to be connected to a tool and at a second end a threaded portion (6) for cutting out a thread in a wall of an opening into which said threaded portion is to be introduced, said threaded portion being provided with at least two cutting edges in the circumferential direction of said body, each of said cutting edges being an integral peripheral part of a flank portion (10) extending substantially radially from the longitudinal extension of said body, said flank portions defining them between a chip removal flute (8) in the longitudinal extension of said body for removal of chips cut from said wall, wherein at least one of said flank portions having a side-wall is provided with a chip-breaking member (12, see also the sentence bridging the left-hand and the right-hand column). Furthermore, the side-wall is divided into a pair of elongated concave surfaces separated by an elongated ridge constituting the chip-breaking member, wherein the elongated ridge is an edge formed by the immediate interconnection of said concave surfaces (see Figure 2). Although concentrating on the threading of nut blanks, E4 describes that the tool is applicable to any threading work (see left-hand column, lines 25-28).

4.2.2 The chip removal flutes of claim 1, which are - contrary to the straight flutes of the tap of E4 - helically shaped over substantially their whole length with the angle (α) between the axial extension of the body and the extension of each of said chip removal flutes being 10°- 25°, lead to an improved transport of the chips (see paragraphs [0015] to [0017] of the patent in suit).

Hence, starting from E4 the problem solved by the claimed invention is the provision of a thread cutting tap with improved transport of the chips.

4.2.3 Appellant 1 submitted that E4 would have dissuaded the person skilled in the art from looking at taps with non-straight flutes, because they would have impaired the functioning of the chip-breaking member due to an unfavourable contact angle between the chips and said member. However, said contact angle does not depend solely on the orientation of the flute but also on a number of other parameters determined by the whole geometry of the tap and the operating conditions. Moreover and most importantly, E4 does not teach that a particular contact angle is to be maintained. Therefore, the person skilled in the art would not have limited himself to thread taps with straight flutes when looking for a solution of the problem above.

Hence, he would have taken into consideration document E3, which discusses, on column 3, lines 32 to 45, the most favourable geometries of the flutes for improving the transport of the chips in a thread cutting tap.

The cited passage teaches that helically shaped flutes are advantageous for the removal of chips. Furthermore, on column 3, lines 14 to 17, specific indications are

given as to the angle of the helix; the preferred angle for a positive pitch being in an a range of 12 to 18°. Therefore, E3 teaches to adopt flutes with a geometry according to claim 1 of the second auxiliary request in order to improve the transport of chips.

It is true that the problem of the chip transport does not figure among the objects of the invention of E3 disclosed on column 1, lines 44 to 57. However, said objects are associated to the effects of the rake angle and the coating material that constitute the gist of the invention of E3 (see column 1, line 58 to column 2, line 3 and claim 1). Hence, this fact does not diminish the disclosure in respect of the effect of the flute geometry on the transport of chips.

Hence, the subject-matter of claim 1 does not involve an inventive step in view of E4 and E3.

5. Third and fourth auxiliary request

Since claim 1 in the third and fourth auxiliary requests corresponds to claim 1 in the first and second auxiliary requests respectively, the third and fourth auxiliary requests are not allowable for the reasons given above.

6. Fifth auxiliary request

Appellant 2 objected to the introduction of the fifth auxiliary request into the proceedings and questioned novelty (in view of E5) and inventive step (in view of the combination of E4 and E2) of the subject-matter of claim 1. No further objections were raised.

6.1 Introduction into the proceedings

The fifth auxiliary request was filed at the oral proceedings before the Board, i.e. at a very late stage of the proceedings.

However, the independent claims were already present as independent claims in the second auxiliary request filed on 14 February 2013, such that appellant 2 had the possibility of considering the reasons that may speak against the maintenance of the patent in this form. Indeed, appellant 2 already raised objections against said independent claims in the written procedure. Accordingly, this request cannot take appellant 2 by surprise and does not raise any issue which would cause a substantial delay in the proceedings.

Under these circumstances, the Board decided to admit the fifth auxiliary request into the proceedings (Article 13(1) RPBA).

6.2 Novelty

E5 discloses a thread cutting tap having an elongated body, comprising at a first end a connector portion (11) adapted to be connected to a tool and at a second end a threaded portion for cutting out a thread in a wall of an opening into which said threaded portion is to be introduced, said threaded portion being provided with at least two cutting edges in the circumferential direction of said body, each of said cutting edges being an integral peripheral part of a flank portion extending substantially radially from the longitudinal extension of said body (see drawings), said flank portions defining thembetween a chip removal flute (14,

15) in the longitudinal extension of said body for removal of chips cut from said wall, wherein at least one of said flank portions having a side-wall is provided with a chip-breaking member (edge between 14 and 15).

As can be seen in the drawings, each flute consists of a "regular groove" 14, which extends full width to the extreme end of the tap, and an "auxiliary groove" 15, at one side of each groove 14, which sets back the cutting edge. Auxiliary groove 15 has a tapered termination as it approaches the end of the tap (see Figures 1 and 4 and page 1, left-hand column, line 51 to right-hand column, line 13). Hence, the flutes are delimited by one straight longitudinal wall formed by regular groove 14 and one tapered wall formed by auxiliary groove 15.

Appellant 2 argued that, in view of said tapered termination of the cutting edges of the teeth, the chip removal flutes of E5 were partly helically shaped, as required by claim 1. However, present claim 1 refers to "the" angle (α) between the axial extension of the body and the extension of each of the chip removal flutes, thus making clear that the claimed tap must exhibit a helical shape of constant angle. By contrast, the angle formed by the tapered termination of the cutting edges formed by auxiliary groove 15 of E5 with the axial extension of the body varies continuously when moving away from the end of the tap towards the section where the flute reaches its full width. Already for this reason the geometry of the flute of E5 is not in accordance with present claim 1.

Moreover, in the Board's view, the wording of the claim, which refers to "helically shaped flutes" being

arranged closest to the second end makes clear that it is not enough that one of the walls delimiting the flute is helically shaped but that the whole flute must, in a portion, exhibit a helical shape. The drawings of the patent in suit, in particular Figures 3A and 3B, cannot convince to the contrary, because they do not show a detailed view from which the shape of the partly helically shaped flute can be clearly established. Indeed the wording of the description referring to Figure 3A and stating that "in the angular portion 26, the flanks 9, 10, 11 and the flutes 12, 13, 14 are formed angularly in relation to the straight flutes, i.e. angularly in relation to the longitudinal extension of the body" (paragraph [0029]), rather supports the Board's understanding of the claim. Also for this reason the geometry of the flute of E5 is not in accordance with present claim 1.

Therefore, the subject-matter of claim 1 is novel over E5.

6.3 Inventive step

Also in the case of claim 1 of the fifth auxiliary request E4 represents the closest prior art for assessing inventive step. Chip-removal flutes which are partly straight and partly helically shaped, with the helically shaped flutes being arranged closest to the second end, and with the angle (α) between the axial extension of the body and the extension of each of chip removal flutes is 1° to 15° , provide an improved transport of the chips (paragraphs [0018] to [0020]). Hence, for this request too, the problem solved by the claimed invention is the provision of a thread cutting tap with improved transport of the chips.

The Board concurs with appellant 2 that the person skilled in the art would consider E2 for solving this problem. E2 discloses a tap with flutes exhibiting a skew formation, whose function is to break up the thread cutting into separate small, curved chips, which are propelled axially forwardly by the skew through the tip of the tool, and can also be easily and quickly flushed out after a bottoming or blind tap operation (column 1, lines 41 to 46). Hence, it is obvious to adopt the skew formation of E2 to solve the problem above.

However, the skew formation proposed by E2 involves, as can be seen in Figures 1 and 2, the formation of a skew surface 20 inclined at an angle of 3° to 20° in only one of the walls delimiting the flute, while the other wall remains oriented in the axial direction of the body. Hence, the wording "spiral point" used in E2 (column 1, lines 14 to 19) clearly refers to the shape of said wall and not to the whole flute. Accordingly, in E2 there is no part of the flute which constitutes a "helically shaped flute" (for the interpretation of this term see point 6.2 above), as required by claim 1. Thus, the combination of E4 and E2 does not lead to the claimed subject-matter.

Therefore, the subject-matter of claim 1 involves 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 on the basis of the following documents:
 - Claims 1 to 10 according to the 5th Auxiliary Request, filed at the oral proceedings on 22 September 2016;
 - Description, columns 1 to 5, filed at the oral proceedings on 22 September 2016;
 - Figures 1A to 4 as granted.

The Registrar:

The Chairwoman:



C. Moser

P. Acton

Decision electronically authenticated