
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TBKS, LLC

Appeal No. 2006-2084
Reexamination Control No. 90/006,360

HEARD: September 11, 2006

Before BARRETT, LEE, and MOORE, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(b) from the final rejection of claims 1-19.

We affirm-in-part, but also enter a new ground of rejection.

REEXAMINATION PROCEEDINGS AND RELATED APPEAL

Reexamination Control No. 90/006,360 was filed on August 20, 2002, by third party requester Engineered Tooling Corp., to request reexamination of claims 1-19 (all claims) of U.S. Patent 5,779,400 ('400 patent), entitled "Small-Shank Tool for Automatic Lathes," issued July 14, 1998, to William R. Fountaine, based on Application 08/632,347, filed April 10, 1996.

Related Reexamination Control No. 90/006,361 was filed on the same day by the same requester to request reexamination of claims 1-17 (all claims) of U.S. Patent 6,033,158 ('158 patent), entitled "Small-Shank Tool for Automatic Lathes," issued March 7, 2000, to William R. Fountaine, based on Application 09/036,346, filed March 6, 1998, which is a continuation-in-part of Application 08/632,347. A decision on appeal was entered in Reexamination Control No. 90/006,361 on June 26, 2006, in Appeal No. 2006-1075.

The records of the U.S. Patent and Trademark Office (USPTO) show that the '400 and '158 patents are both assigned to TBKS, LLC, 394 Chase River Road, Waterbury, CT, 06704 (hereinafter the "patent owner").

LITIGATION

The '400 and '158 patents were the subject of a civil action styled *Fountaine v. Engineered Tool Corp. and Robert S. Snyder*, No. 02-30001-MAP (D. Mass., filed January 3, 2002). An order of dismissal without prejudice was entered by Judge Michael A. Ponsor on March 16, 2005.

BACKGROUND

The invention relates to small-shank cutting tools with interchangeable tool inserts for use on automatic lathes. The following description of the prior art and the inventions is taken from the '400 patent and the declaration of the inventor William Fountaine, dated July 3, 1997, in Application 08/632,347 (Exhibit 3 to request for reexamination).

In a typical Swiss-type automatic screw machine, a plurality of cutting tools are radially disposed about a sliding headstock (the part of a lathe that supports and drives a revolving part) for cutting a workpiece, which is rotatably and longitudinally driven relative to the tools. The cutting tools are typically comprised of a tool bit or insert attached to a tool holder or shank, and the shanks

are selectively activated to move the tools radially into and out of engagement with the workpiece to cut the workpiece as desired.

The tool shanks are typically made of rectangular-shaped bars which are slidably mounted within corresponding channels formed in a tool turret. The tool shanks are provided in the following industry-standard widths: 7 mm, 8 mm, 10 mm, 12 mm, 5/16 inch, and 1/2 inch. Most smaller automatic screw machines can accommodate only the 7 mm and 8 mm width shanks, referred to as "small-shank" cutting tools.

Cutting tools having a shank width of 8 mm or larger are available in several different configurations. In one type, the carbide tool bits are brazed to the ends of the shanks. In another, interchangeable carbide tool inserts are screwed to or clamped to the ends of the shanks. Each type has its advantages and disadvantages. The present invention relates to small-shank tools with interchangeable tool inserts.

Mr. Fountaine's declaration states (¶ 4):

> 4. Based upon my knowledge and experience in the machine tool industry, both large-shank and small-shank tools have been commercially available for use on automatic lathes for about fifty (50) years. During this time, commercially-available small-shank tools have been primarily of the

type having the carbide tool bit brazed to the end of the shank (commonly identified as "brazed tools"). To a lesser extent, there have been commercially-available tools having an 8 mm width shank with an expanded-width foot ("club foot") formed at one end of the shank, and an indexable carbide insert screwed to the foot as shown typically in Exhibit 1 (commonly identified as "club-foot tools"). I am also aware of one manufacturer that has provided a small shank tool having an 8 mm width shank, and an indexable insert having an inscribed circle approximately equal to the width of the shank. This prior art tool is illustrated typically in FIG. 1 of this patent application.

Exhibit 1 is reproduced below.

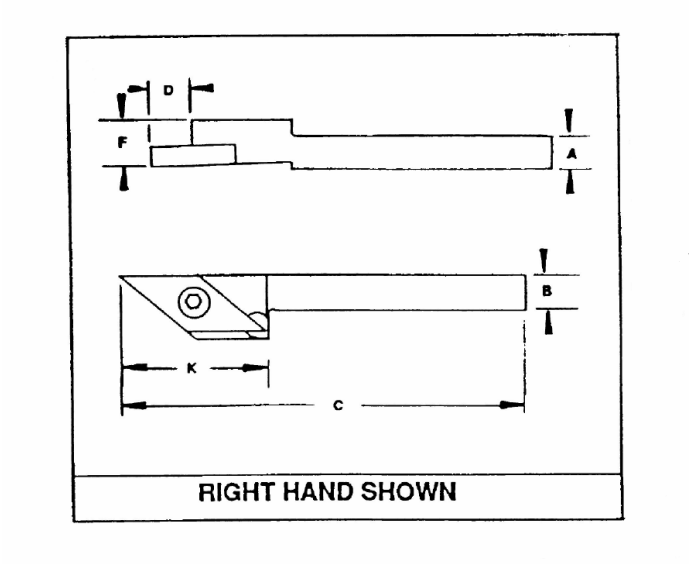


Exhibit 1, from a 1990 Engineered Tool Corp. (ETCO) catalog, shows a tool holder with a "club foot."

Figure 1 of the '400 patent is reproduced below.

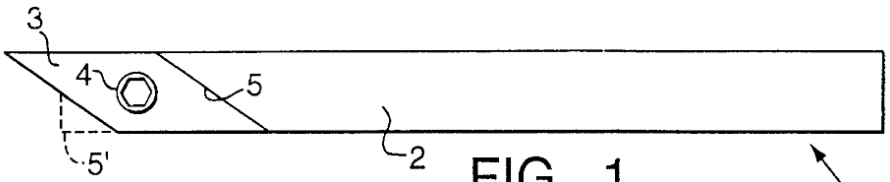


FIG. 1
PRIOR ART

Figure 1 shows a prior art small-shank tool. The cutting tool 1 in Fig. 1 includes a rectangular-shaped shank 2 having a width of 8 mm, and a rhomboidal-shaped insert 3. The tool insert 3 is defined by an inscribed circle (not illustrated), which is approximately equal to the width of the shank. The shank defines a single tool-supporting edge 5 for engaging and supporting a corresponding edge of the tool insert. One of the problems is that if the insert is torqued in the clockwise direction, the tool insert may become relatively easily dislodged on the shank. It is stated that industry has attempted to overcome this problem by providing another smaller supporting edge 5' on the opposite side of the tool insert relative to the first supporting edge 5. However, because of the size and location of the second supporting edge, it provides little additional support and has proven to break away relatively easily.

Figures 2 and 4 of the '400 patent are reproduced below.

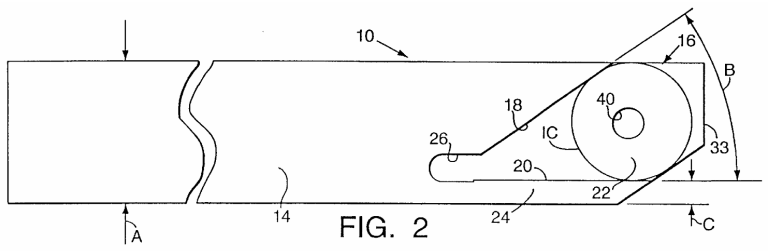


FIG. 2

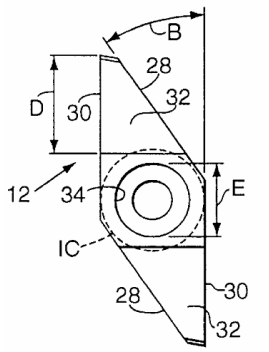
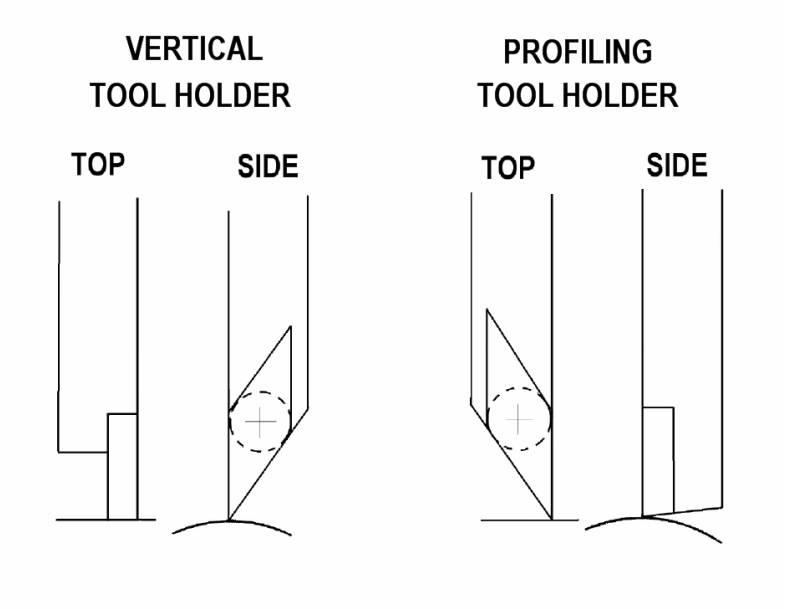


FIG. 4

Figure 2 depicts a tool shank 10 and Fig. 4 shows a rhomboidal-shaped tool insert 12 for use with the tool shank 10 of Fig. 2. The shank has two tool-supporting surfaces 18, 20 defining an angle B and has an elongated lip or supporting body section 24 along one edge. "In the embodiment of the present invention illustrated, the angle B is approximately 35°; however, as will be recognized by those skilled in the pertinent art, this angle may be changed as desired depending upon the requirements of a particular cutting tool design or other machining system." ('400 patent, col. 4, lines 28-33.) The tool insert is defined by an inscribed circle IC having a diameter less than the width of the tool shank. It is described that "substantially the entire depth D of the respective

cutting tip 32 extends beyond the end surface 33 of the shank (FIGS. 2 and 3)" (*id.*, col. 4, lines 35-37).

Tools used on lathes include "vertical" and "profiling" tools, which terms are used in the arguments, but are not mentioned in the '400 patent. With a "vertical" tool holder and insert, the insert lies in a plane perpendicular to the axis of the workpiece and the cutting tip extends beyond the end of the shank to provide clearance to allow the machining operations of Fig. 7 of the '400 patent, whereas with a "profiling" tool, the cutting tip of the insert is in the same plane as the axis of the workpiece and the bottom of the insert is fully supported by the recess in the shank. "Vertical" and "profiling" tool holders are illustrated below.



These drawing show "vertical" and "profiling" tool holders as seen from the top and side with respect to the workpiece. The "rhomboidal" or diamond shape of the insert is seen in the side view of the vertical tool holder (i.e., looking down the axis of the part being machined) and in the top view of the profiling tool holder.

Claims 1 and 16 are reproduced below (omissions from the original patent claim are enclosed in brackets and additions are underlined, see 37 CFR § 1.530(f)).

1. A small-shank tool for an automatic lathe, comprising:

a tool shank defining a rectangular cross-sectional shape and having a maximum width less than approximately 9 mm. and including a tool recess defined at one end of the shank by two tool-supporting surfaces oriented at an acute angle relative to each other for receiving and supporting a tool insert, wherein one of the tool-supporting surfaces is oriented approximately parallel to an adjacent side of the shank forming an elongated body portion between the tool recess and the respective side of the shank and having a thickness of at least approximately 1.0 mm;

an approximately rhomboidal-shape tool insert defined by an inscribed circle having a diameter less than approximately 90% of the shank width, and defining a fastener aperture extending through the approximate center of the inscribed circle having a diameter less than approximately 70% of the diameter of the inscribed circle, the rhomboidal-shaped tool insert being received within the tool recess with two sides of the insert each fully engaging a respective tool-supporting surface of the shank without any substantial portion of the two sides extending beyond the respective tool-supporting surfaces, and with a substantial portion of the other two

sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece; and

a threaded fastener extending through the fastener aperture and threadedly attached to the tool shank for fixedly attaching the tool insert to the tool shank, the threaded fastener defining a head having a maximum diameter less than approximately 70% of the diameter of the inscribed circle.

16. A tool insert for a small-shank tool for an automatic lathe, wherein the small-shank tool includes a tool shank having a maximum width of less than approximately 9 mm and a tool recess defined at one end of the shank by two tool-supporting surfaces oriented at an acute angle relative to each other for receiving and supporting the tool insert, wherein one of the tool-supporting surfaces is oriented approximately parallel to an adjacent side of the shank forming an elongated body portion between the tool recess and the respective side of the shank, and defines a thickness of at least approximately 1.0 mm, and the small-shank tool further includes a threaded fastener for fixedly attaching the tool insert to the tool shank; said tool insert comprising:

four sides defining an approximately rhomboidal-shape, said insert defining an inscribed circle having a diameter less than approximately 90% of the shank width, and a fastener aperture extending through the approximate center of the inscribed circle having a diameter less than approximately 70% of the diameter of the inscribed circle, the rhomboidal-shaped insert being receivable within the tool recess of the tool shank with two sides of the insert each fully engaging a respective tool-supporting surface of the shank without any substantial portion of the two sides extending beyond the respective tool-supporting surfaces, and with a substantial portion of the other two sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece.

THE REFERENCES

The examiner relies on the following references:

Kyocera catalog, published September 5, 1993 (Exhibit 6 of the request for reexamination), cover and pages 2-6 and 11 ("Bates" numbered E613-618 and E623). The insert screws noted in the tables on page 6 of the catalog are shown in a Kyocera engineering drawing and catalog page (Exhibit 7 of the request for reexamination).

Kennametal catalog, published 1994 (Exhibit 8 of request for reexamination), cover and pages 5 ("Bates" numbered E155) and 16 ("Bates" numbered E166).

THE REJECTIONS

Claims 1, 3-10, 12-16, and 19 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kyocera.

Claims 2, 11, 17, and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kyocera and Kennametal.

Pages of the final rejection entered March 21, 2005, are referred to as "FR_." Pages of the examiner's answer entered January 12, 2006, are referred to as "EA_." Pages of the appeal brief received November 11, 2005, are referred to as "Br_." Pages of the reply brief received March 10, 2006, are referred to as "RBr_."

DISCUSSION

Snyder affidavit

The request for reexamination includes an affidavit of Robert Snyder, president of Engineered Tool Co. ("ETCO"), filed in *Fountaine v. Engineered Tool Co.* (date filed not readable) (Exhibit 12 to request for reexamination). ETCO and Mr. Snyder were co-defendants in that civil action, which has been dismissed without prejudice. Mr. Snyder's affidavit includes Exhibits A to O, which are sketches, engineering drawings, invoices, faxes, and catalog pages. As explained in detail in our opinion in Reexamination Control No. 90/006,361, Appeal No. 2006-1075, reexamination proceedings are limited to consideration of patents and printed publications, and the exhibits have one or more of the following problems: (1) some are not prior art; (2) there is no evidence or indicia that others are printed publications; and/or (3) the structure of what is referred to is not clear. For these reasons, the Snyder affidavit is not entitled to any weight in this reexamination proceeding.

Claim interpretation

"Analysis begins with a key legal question--*what* is the invention *claimed*?" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). Several limitations in the claims require interpretation.

Substantial portion of two sides extending beyond the end of the shank

Independent claims 1, 2, and 16-18 recite "a substantial portion of the other two sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece" (claim 1 uses the spelling "work piece," but we use "workpiece" for consistency with the other claims). Independent claims 10 and 11 recite "a substantial portion of the other two sides of the rhomboidal insert extending beyond the respective end of the tool shank and defining at least one cutting edge for cutting a workpiece." These are the only limitations argued by the patent owner. The question is what is meant by a "substantial portion."

The '400 patent describes the tool insert as having four sides forming a substantially rhomboidal or diamond shape, where "[e]ach first side 28 of the insert is oriented at an acute angle B relative to a respective second side 30, and the adjacent pairs of first and second sides each form a respective cutting tip 32 having

a depth 'D', as shown in FIG. 4" (col. 4, lines 10-14). It is described that "[w]hen the tool insert 12 is received within the recess 16 of the shank, preferably substantially the entire depth D of the respective cutting tip 32 extends beyond the end surface 33 of the shank (FIGS. 2 and 3)" (col. 4, lines 33-37). Patent owner argues that "substantial" is defined in the dictionary as "considerable in quantity: significantly large," which is said to be consistent with the specification, which describes the cutting tip extending beyond the end of the tool shank such that the cutting tip can contact the surface of the workpiece without any interference from the tool shank (Br8-9). It is argued that "one skilled in the art would understand the claim term 'substantial portion' to mean that a sufficiently large portion of the two sides of the insert extend beyond the end of the tool shank to allow the cutting insert to cut a workpiece in the manner described in the specification" (Br9; *see also* RBr2).

The request for reexamination states, for example, that "[a] 'substantial portion' of the other two sides of KYOCERA'S ['profiling'] insert extend beyond the end of the shank by virtue of the fact that the sides extend out an amount sufficient 'to form a cutting tip'" (Req. Reexam at 19), which interpretation is

adopted by the examiner (EA7). That is, the reexamination requester and the examiner interpret a "substantial portion" to be met if the sides perform the function of "forming a cutting tip for cutting a workpiece." We disagree.

In the limitation, "a substantial portion of the other two sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece," we interpret "a substantial portion of the other two sides of the insert extending beyond the end of the shank" to be one limitation, and the limitation "and forming a cutting tip for cutting a workpiece" to be an additional limitation on the two sides. A "substantial portion of the other two sides of the insert extending beyond the end of the shank" is not met just because the two sides form a cutting tip. The term "substantial portion" is a relative term, which does not inherently convey any exact quantifiable amount. Nevertheless, we conclude that one of ordinary skill in the art would have understood a "substantial portion" to mean a "significant portion," or "more than a small portion," as shown in the figures.

Claims 16-19 recite a tool insert alone

Claims 1-15 are unquestionably directed to a "small-shank tool" having the combination of a tool shank, a tool insert, and a threaded fastener, i.e., the complete tool.

We interpret claims 16-19 to be directed to a "tool insert" alone, and not the combination of a tool insert, a tool shank, and a threaded fastener. It is not surprising that the claims would claim the insert alone because inserts are sold separately from shanks. The preambles of independent claims 16-19 recite "[a] tool insert *for* a small-shank tool for an automatic lathe, wherein the small-shank tool includes a tool shank . . ., and the small-shank tool further includes a threaded fastener for fixedly attaching the tool insert to the tool shank; *said tool insert comprising*" (emphasis added). The transition phrase, "said tool insert comprising" indicates that what is being claimed is the insert alone. The preamble phrase "*for* a small-shank tool" is interpreted to be a statement of intended use, i.e., the tool insert is intended to be used with a tool shank and fastener, which are not claimed as part of the combination. "There is an extensive body of precedent on the question of whether a statement of intended use

constitutes a limitation for the purpose of patentability. Such statements often, although not necessarily, appear in the claims preamble . . . . Whether a preamble of intended purpose constitutes a limitation to the claims is, as has long been established, a matter to be determined on the facts of each case in view of the claimed invention as a whole." (Citations omitted.) *In re Stencel*, 828 F.2d 751, 754, 4 USPQ2d 1071, 1073 (Fed. Cir. 1987). *See also Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345, 65 USPQ2d 1961, 1965 (Fed. Cir. 2003) ("An intended use or purpose usually will not limit the scope of the claim because such statements usually do no more than define a context in which the invention operates."); *Loctite Corp. v. Ultraseal, Ltd.*, 781 F.2d 861, 868, 228 USPQ 90, 94 (Fed. Cir. 1985) ("we interpret 'adapted to remain ... metal surfaces' as merely language of intended use, not a claim limitation"). The bodies of the claims define the structure of the insert by reference to the tool shank, but do not require the tool shank to be part of the combination; e.g., "the . . . insert *being receivable* within the tool recess of the tool shank," indicates a capability or intended use, but does not require the tool shank in combination. By comparison, claim 1 recites "[a] small-shank tool for an automatic lathe, comprising: a tool

shank . . .; an approximately rhomboidal-shaped tool insert . . .; and a threaded fastener . . .," which clearly recites the combination of a tool shank, tool insert, and threaded fastener. For these reasons, we disagree with patent owner's statement that the seven independent claims are "each directed to a tool insert in combination with a tool shank for cutting on an automatic lathe" (Br2): only claims 1-15 recite the combination.

Although the tool shank and threaded fastener are part of a statement of intended use and not part of claims 16-19, this does not mean that the limitations are completely ignored. We interpret the tool shank and threaded fastener limitations to limit the claims to the extent that they limit the structure of the tool insert. One limitation is "said insert defining an inscribed circle having a diameter less than approximately 90% of the shank width," where the shank has a maximum width of "less than approximately 9 mm." This limits the diameter of the inscribed circle of the insert to less than 90% of 9 mm (less than 0.81 mm). The diameter of the fastener aperture has a "diameter less than approximately 70% of the diameter of the inscribed circle" and, so, is indirectly limited by the shank width. The other limitations of the tool shank in the preamble and the relationships between the tool

insert and the tool shank in the claim bodies do not limit the tool insert structure and are not limitations for determining patentability. Thus, for example, the limitation in claims 16-18, "a substantial portion of the other two sides of the insert extending outwardly beyond the end of the shank and forming a cutting tip for cutting a workpiece," is a statement of an intended relationship between the insert and tool shank when the insert is eventually installed on a tool shank, but it does not limit the structure of the tool insert and is not a claim limitation. This interpretation is consistent with *Stencel*, where a claim to a "driver" was limited as to structure defined by the structure of a "collar" with deformable lobes in the preamble. Since use of the tool insert with the tool shank is an intended use, it is not necessary to show the limitations of the tool shank or relationship between the tool insert and the tool shank: it is only necessary to find a the tool insert structure capable of fitting in a tool shank structure as described in the claims and satisfying the 90% and 70% limitations.

Rhomboidal-shaped

Independent claims 1 and 2 recite "an approximately rhomboidal-shaped tool insert"; independent claims 10 and 11 recite "a generally rhomboidal-shaped

tool insert"; and independent claims 16-18 recite that the tool insert has "four sides defining an approximately rhomboidal shape." "Rhomboidal" is defined as "[s]haped like a rhombus or rhomboid." *The American Heritage® Dictionary of the English Language* (4th ed., Houghton Mifflin Co. 2000). A "rhomboid" is defined as "[a] parallelogram with unequal adjacent sides," *id.*, and a "rhombus" is defined as "[an] equilateral parallelogram," *id.* Thus, a "rhomboidal shape" reads on parallelograms with unequal adjacent sides (rhomboid) and parallelograms with equal adjacent sides (all of its sides are then necessarily equal) (rhombus). The insert in Fig. 4 is a rhombus.

Vertical tool not recited

The claims do not expressly recite a "vertical" insert and tool holder. The limitation of "a substantial portion of the other two sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece," in claims 1, 2, and 16-18, and the similar limitation in claims 10 and 11, perhaps indirectly implies a vertical tool insert and tool shank, because this relationship is present in a vertical tool, whereas the bottom surface of a "profiling" tool insert is normally fully supported by the tool shank (as shown, for example, in Kyocera).

Nevertheless, the claims do not expressly recite a "vertical" tool and we will not read implicit limitations into the claims. The limitation of a "cutting tip" in claims 1, 2, and 16-18, refers to a pointed end or apex, but this does not distinguish over the point of a single-point "profiling" insert. Independent claims 10 and 11 recite "at least one cutting edge" rather than a "cutting tip." An "edge" is the line at which two surfaces of a solid object meet. Patent owner states that the "profiling tool [in Kyocera] has two cutting edges, rather than a cutting tip" (Br7-8); therefore, we interpret that the "edge" can be the line where the side surfaces of the insert meet the front surface and not necessarily the line representing the intersection of the two side surfaces. The limitations of "cutting tip" and "cutting edge" do not inherently require a vertical tool. We agree with the examiner's interpretation that "the vertical tool shank is not a limitation of the claimed invention based on the language of claim 1" (EA20; *see also* EA21).

Fastener aperture diameter

The '400 patent discloses that the insert has a countersunk aperture through the approximate center of the inscribed circle and "[t]he countersunk aperture 34 defines a maximum diameter E which is sufficiently less than the diameter of the

inscribed circle IC of the insert to maintain it structural integrity" (col. 4, lines 64-66). That is, maximum diameter E of the countersunk aperture 34 is the maximum diameter of the countersink. The '400 patent discloses that a preferred fastener has a 2.5 mm diameter (erroneously stated to be a "2.5 mm pitch") (col. 5, lines 39-42), but does not mention the maximum diameter of the countersink.

Independent claims 1, 2, and 16-18 recite a "fastener aperture . . . having a diameter less than approximately 70% of the diameter of the inscribed circle," and do not recite the use of a countersunk head fastener. *Any* aperture diameter less than 70% of the IC diameter satisfies this claim limitation: the diameter does not have to be a maximum diameter. Independent claims 10 and 11 recite "wherein the fastener aperture has a maximum diameter within the range of approximately 3 mm through 4.5 mm," and recite a countersunk head fastener, which we interpret to define the largest diameter of the countersunk portion of the aperture.

Inscribed circle diameter

This claim interpretation only relates to the new ground of rejection, *infra*, which relies on Nikcole. Claims 10 and 11 recite a "tool insert defined by an inscribed circle having a diameter within the range of approximately 5.5 mm

through 6.5 mm." Independent claims 1 and 16 recite an insert defined by an "inscribed circle having a diameter less than approximately 90% of the shank width," and dependent claims 4 and 9, which depend on claims 1 and 16, respectively, recite that the "inscribed circle has a diameter within the range of approximately 5.5 mm through 6.5 mm." The question is what is meant by "approximately." Reexamination requester interprets "approximately . . . 6.5 mm" to include slightly less than 7 mm, as taught by Nikcole, because (Req. Reexam at 13-14):

> NIKCOLE's tool insert is rhomboidal-shaped with an inscribed circle that is less than 7 mm and therefore within the range of **approximately** 6.5 mm. Since there is no definition of the word "approximately", and looking to the specification for guidance as to its meaning, the diameter of the inscribed circle is described as preferably less than 90% of the shank width. As such, since the range of the shank in this claim is 7 to 8 mm, the upper end of 90% of 8 mm is 7.2 mm. Therefore NIKCOLE's inscribed circle that is slightly less than 7 mm is within the claimed range.
>
> The '400 patent discloses (col. 4, lines 41-59):
>
> In the embodiment of the present invention illustrated, the tool insert 12 is designed for tool shanks having a width A of 7 mm or greater, and therefore the diameter of the inscribed circle IC is approximately 6 mm. Accordingly, in a shank 10 having a width of 7 mm, the thickness C of the supporting lip 24 is approximately 1 mm, and in larger-width shanks the thickness C may be greater. In accordance with the present invention, for such small-width shanks (i.e., 8 mm or less), the diameter of the inscribed circle

> IC should be no more than approximately 90% of the width A of the shank, and for 7 mm shanks, the diameter of the inscribed circle IC is preferably approximately 86% or less of the shank width, in order to ensure that the lip 24 has sufficient thickness and structural integrity to fixedly support the tool insert during machining operations. Accordingly, the diameter of the inscribed circle IC is preferably within the range of approximately 5.5 mm to 6.5 mm for shanks having a width within the range of approximately 7 mm to 8 mm.

An inscribed circle (IC) is the largest circle that can be inscribed within the four sides of the rhomboidal-shaped insert. The IC diameter must be less than 90% of the width of the shank and, so, must be less than 7.2 mm for an 8 mm shank. The IC diameter is also constrained to be less than or equal to the width of the shank minus the width of the supporting lip 24 and the lip is preferably at least 1 mm; therefore, the IC diameter must be less than or equal to 7 mm for an 8 mm shank and a 1 mm lip. The term "Accordingly" beginning the last sentence quoted above suggests that the "approximately . . . 6.5 mm" number is based on the 90% and 1 mm dimensions discussed in the preceding sentences and would include 7 mm. Certainly, no reasons are provided for the use of 6.5 mm for an 8 mm shank width. Nevertheless, 6.5 mm is less than 7 mm and we will not interpret "approximately" 6.5 mm to read on 7 mm. Since the new ground of rejection is based on obviousness, it is not necessary to adopt a forced claim interpretation.

Anticipation

"Having construed the claim limitations at issue, we now compare the claims to the prior art to determine if the prior art anticipates those claims." *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349, 64 USPQ2d 1202, 1206 (Fed. Cir. 2002). "Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim. A prior art disclosure that 'almost' meets that standard may render the claim invalid under § 103; it does not 'anticipate.'" (Citation omitted.) *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983).

Kyocera teaches a tool holder SDJCR 0808F-07F (page 6) for use with DCMH inserts having a 1/4" (= 0.250" = 6.35 mm) diameter inscribed circle (IC) and which uses insert screw number SB-2570 (table, page 6). The SDJC tool holder has an 8 mm square shank, which meets the "less than approximately 9 mm" shank width limitation of claims 1 and 16; the "width within the range of approximately 7 mm through 8 mm" limitation of claim 10; and the shank width limitations of dependent claims 3-5. The tool holder has a tool recess with two tool-supporting surfaces at an acute angle and a surface which supports the entire

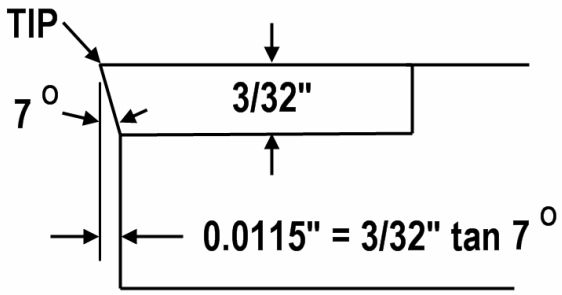
bottom of the tool insert, so it is a "profiling" tool. The tool holder accepts an insert with a 0.250" IC, so the elongated body portion (corresponding to lip 24 in Fig. 2 of the '400 patent) is 8 mm - 6.35 mm = 1.65 mm, and, so, has a "thickness of at least approximately 1.0 mm," as recited in claims 1, 10, and 16. A representative insert is DCMH-21.50HQ, which has a rhombus shape with an IC diameter of 0.250" (= 6.35 mm), which is "less than approximately 90% of the shank width" (0.9 x 8 mm = 7.2 mm), as recited in claims 1 and 16, and falls "within the range of approximately 5.5 mm through 6.5 mm," as recited in claims 4, 10, and 19. The insert has an acute angle of 55° between sides at the cutting tips and a hole diameter of 0.110" (= 2.794 mm) (page 11 (number not shown); also Bates numbered "E618") to accept the 2.5 mm diameter SB-2570 screw. SB-2570 is a countersunk screw having a 60° countersink angle having a head diameter of 0.138" (= 3.505 mm) (Exhibit 7). Thus, the head diameter is "less than approximately 70% of the diameter of the inscribed circle" (0.7 x 6.35 mm = 4.45 mm) as recited in claim 1 and is "within the range of approximately 3 mm through 4.5 mm," as recited in claims 5 and 10; and has a countersink angle within the range of claim 6, and is specifically 60° as recited in

claim 7. Since the head diameter of the screw is 3.5 mm, the maximum diameter of the countersunk aperture is less than 3.5 mm, which meets the limitations of "less than approximately 70% of the diameter of the inscribed circle" (0.7 x 0.250" = 0.175" = 4.45 mm), as recited in claims 1 and 16, and "within the range of approximately 3 mm through 4.5 mm," as recited in claim 10. Two sides of the insert fully engage the tool-supporting surfaces of the shank and the other two sides "form[] a cutting tip for cutting a workpiece," as recited in claims 1 and 16, and "defin[e] at least one cutting edge for cutting a workpiece," as recited in claim 10. The tool shank defines a planar outer surface, as recited in claims 8 and 14, and the outer surface of the tool insert is substantially coplanar with the outer surface of the tool shank, as recited in claims 9 and 15.

The only possible differences between the subject matter of claims 1, 3-10, 16, and 19, and Kyocera are the limitation "a substantial portion of the other two sides of the insert extending beyond the end of the shank," in claims 1 and 16, and the limitation "a substantial portion of the other two sides of the rhomboidal insert extending beyond the respective end of the tool shank," in claim 10. The examiner finds that the limitations are met because the bottom edge of the sides of the insert

are supported by the shank and the sides of the insert extend outwardly beyond the end of the shank by the 7° relief angle (FR6).[1] Patent owner argues that "the tools described in Kyocera are profiling tools wherein the cutting edge does not extend substantially beyond the end of the tool shank" (Br7). It is argued that Kyocera's insert is entirely supported on the bottom and the 7° relief angle would cause the sides of the tool insert to extend out at most 0.019" for an insert thickness of 5/32" (i.e., 5/32" tan 7° = 0.019") and therefore "[t]he 7 degree relief angle does not result in a substantial portion of the cutting insert extending beyond the end of the tool shank" (Br8). "The infinitesimal portion of the outer face of the cutting insert of the profiling tool referenced by the Examiner is not a 'substantial portion' of the cutting edge as recited in claim 1 as amended." (Br9.) For an insert with an inscribed circle of 0.250", as in Kyocera, the thickness is 3/32" for a distance of 0.0115" (= 3/32" tan 7°). An illustration of patent owner's argument is shown on the next page.

[1] The intersection of two planes oriented at an acute angle, each inclined from the vertical by 7°, actually results in an angle at the intersection greater than 7°.



The illustration shows that the tip of an insert having a 3/32" thickness extends outward beyond the end of the shank by 0.0115" due to the 7° relief angle.

Claims 1, 3-10, and 12-15

We agree with patent owner that the small amount that the sides of the insert extend beyond the end of the shank in Kyocera does not reasonably meet the limitation "a substantial portion of the other two sides of the insert extending beyond the end of the shank," in claim 1, and the limitation "a substantial portion of the other two sides of the rhomboidal insert extending beyond the respective end of the tool shank," in claim 10. "Substantial" is interpreted to mean more than an incidental amount. The rejection of claims 1, 3-10, and 12-15 is reversed.

Claims 16 and 19

We have interpreted "a substantial portion of the other two sides of the insert extending beyond the end of the shank and forming a cutting tip for cutting a workpiece" in claim 16 to be a statement of intended use that is not entitled to patentable weight because the tool shank is not positively recited in combination in claim 16 and the relationship between the tool insert and the tool shank with which it is intended to be used does not limit the structure of the tool insert. Thus, patent owner's argument is not persuasive of error. We also interpret that these claims do not positively recite the structure of a "vertical" insert. The structure of the tool insert alone is anticipated by the tool insert in Kyocera. Thus, the rejection of claims 16 and 19 is sustained.

Obviousness

Claims 2 and 11

Independent claim 2 contains the same limitation of "a substantial portion of the other two sides of the insert extending beyond the end of the shank" as recited in claim 1. Independent claim 11 contains the same limitation of "a substantial portion of the other two sides of the rhomboidal insert extending beyond the

respective end of the tool shank," as recited in claim 10. We found that these limitations are not taught by the small amount that the tip extends beyond the shank due to the 7° relief angle in Kyocera. Kennametal is applied to show a tool shank "wherein the first and second tool-supporting surfaces are oriented at an angle of approximately 35° relative to each other," as recited in claims 1 and 11. *See* EA17. Kennametal is a profiling tool like Kyocera where the tip of the insert extend beyond the shank due to a 5° relief angle, which is even less than the 7° angle in Kyocera. Therefore, Kennametal does not cure the deficiencies of Kyocera. Accordingly, the rejection of claims 2 and 11 is reversed.

Claims 17 and 18

The examiner concludes that it would have been obvious to modify the 55° angle in Kyocera to be 35° given the 35° teachings of Kennametal "in order to facilitate easier accessing and deeper tool feeding into the workpiece having a narrow space for the KYOCERA's tool during a cutting process" (FR18). The examiner's rejection is also based on the finding that a substantial portion of the sides of the insert in Kyocera extend beyond the end of the tool shank.

We interpret claims 17 and 18 to be directed to a "tool insert" alone. The tool shank limitations and the relationship between the insert and the shank are interpreted to be statements of intended use, i.e., the claims are directed to a "tool insert *for* a small-shank tool." The tool shank only imposes dimensional limitations on the inscribed circle diameter and the fastener aperture diameter of the insert. Thus, the examiner's erroneous finding that a substantial portion of the sides of the insert in Kyocera extend beyond the end of the tool shank does not affect the analysis. We also interpret that claims 17 and 18 do not expressly claim a "vertical" insert structure, and are broad enough to read on a "profiling" insert.

Kyocera discloses a profiling insert with a 55° acute angle between sides. The sole difference between the subject matter of claim 17 and Kyocera is that claim 17 recites "wherein the two sides of the insert engaging the tool-supporting surfaces are oriented at an angle of approximately 35° relative to each other." The sole difference between the subject matter of claim 18 and Kyocera is that claim 18 recites "wherein the two sides of the insert extending beyond the end of the shank are oriented at an angle of approximately 35° relative to each other."

Kennametal discloses a profiling tool insert, such as VBMT-221LF, having an inscribed circle with a 0.250" diameter, equilateral sides oriented at an angle of 35° to each other, and a hole diameter of 0.110" (= 2.794 mm) ("Bates" numbered page E166). Based on our interpretation that claims 17 and 18 are directed only to an insert which is intended for use with a tool shank, and that a vertical insert is not expressly claimed, there are no differences between the insert in claims 17 and 18 and the insert in Kennametal. Nevertheless, we agree with the examiner's conclusion that one of ordinary skill in the machine tool art would have been motivated to modify the 55° angle in Kyocera to be 35° given the express teachings of Kennametal that 35° inserts were well known in the art. In addition, the '400 patent expressly states that "[i]n the embodiment of the present invention illustrated, the angle B is approximately 35°; however, as will be recognized by those skilled in the pertinent art, this angle may be changed as desired depending upon the requirements of a particular cutting tool design or other machining system" (col. 4, lines 28-33), which indicates that the angle is an obvious matter of design choice to one skilled in the art. The examiner's rationale, "in order to facilitate easier accessing and deeper tool feeding into the workpiece having a

narrow space for the KYOCERA's tool during a cutting process" (FR18), i.e., that a 35° insert is narrower than a 55° insert (compare SVAB tool in Kennametal with the SDJC tool in Kyocera) and increases the allowable depth of cut, reflects a cutting tool design consideration and has not been argued to be erroneous. We have considered patent owner's evidence of commercial success and copying but, as discussed in the new ground of rejection, we find that the evidence lacks any nexus to the merits of the claimed invention and is not entitled to any weight in the obviousness determination. The combination of Kyocera and Kennametal establishes a prima facie case of obviousness.

Patent owner does not argue that substitution of a 35° angle for a 55° angle would have been nonobvious. Instead, patent owner argues that the combination of Kyocera and Kennametal does not meet the limitation requiring that a substantial portion of two sides of the insert extend beyond the end of the tool shank to form a cutting tip, because both are profiling tools (Br11-12). This argument is not persuasive because claims 17 and 18 are directed to the insert alone and the relationship between the insert and the tool shank is a statement of intended use that is not entitled to any patentable weight. It is sufficient that the

inserts in Kyocera and Kennametal are capable of being fitted to a tool shank to produce the claimed relationship.

Patent owner argues that if the Kyocera tool shank were modified to allow two sides of the cutting insert to extend substantially beyond the end of the tool shank, the resulting device would not be properly supported to profile a rotating workpiece (Br12). While a profiling insert used on a vertical tool shank would not be optimally supported for machining, this does not mean it will not work. A profiling insert could be used on a vertical tool shank.

Patent owner has not shown any error in the rejection. Accordingly, the rejection of claims 17 and 18 is sustained.

NEW GROUND OF REJECTION UNDER 37 CFR § 41.50(b)

References

The following reference of record are applied in a new ground of rejection:

"Tool Holders and Inserts for CNC 'Swiss-Type' Automatics" catalog, Max Bar (1992) (of record in '400 patent).

"Mini-Shank Tooling Indexable Inserts" catalog, Engineered Tooling Corp. (ETCO) (1990) (of record in '400 patent).

"Nikcole Mini-Thin™ Grooving and Cutoff System" catalog, Nikcole, Inc. (August 1992) (Exhibit 4 to request for reexamination).

Kyocera catalog, published September 5, 1993 (Exhibit 6 of the request for reexamination), cover and pages 2-6 and 11 ("Bates" numbered E613-618 and E623). The insert screws noted in the tables on page 6 of the catalog are shown in a Kyocera engineering drawing and catalog page (Exhibit 7 of the request for reexamination).

The rejection

Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Max Bar, ETCO, Nikcole, and Kyocera. This is a new ground of rejection pursuant to 37 CFR § 41.50(b).

During the prosecution of the '400 patent, the examiner did not rely on the same portion of ETCO used in this rejection and did not rely on Max Bar or Kyocera. Nikcole was not of record in the '400 patent. Therefore, a rejection of this pre-November 2, 2002, reexamination, when the amendment to 35 U.S.C. § 303(a) became effective, expressly allowing consideration of previously cited or considered patents or publications in determining the existence of a substantial new question of patentability, is proper under USPTO guidelines. *See Guidelines for Reexamination of Cases in View of In re Portola Packaging, Inc., 110 F.3d 786, 42 USPQ2d 1295 (Fed. Cir. 1997)*, 64 Fed. Reg. 15346 (Mar. 31, 1999) ("the PTO

may order and conduct reexamination based on prior art that was cited but whose relevance to patentability was not discussed in any prior related PTO proceedings"). In any case, since any reexamination filed today permits consideration of all references previously cited or considered, a *Portola Packaging* argument merely delays the inevitable.

Obviousness

Scope and content of the prior art

Scope

The "scope" of the prior art relates to whether references are from "analogous art" that may be relied on in patentability determinations. *See In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986) (the reference must either be in the field of the applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983) ("The scope of the prior art has been defined as that 'reasonably pertinent to the particular problem with which the inventor was involved'.").

The field of the inventor's endeavor is tools for automatic lathes, in particular, tools having interchangeable tool inserts. Max Bar, ETCO, and Nikcole relate to "vertical" tools and are clearly within the inventor's field of endeavor. Kyoceras relate to "profiling" tools, which are also within the inventor's field of endeavor. Even if the field of endeavor is defined more narrowly as "vertical" tools, Kyocera is highly pertinent to the problems of mounting inserts to small shank tools. There is no dispute that the references are within the scope of the art.

Content

The contents of Kyocera are described in the anticipation rejection.

Max Bar discloses 35° Series "vertical" inserts for turning, cut off, grooving, and threading, where 35° refers to the acute angle between sides of the insert. The complete dimensions of the Max-Bar 35° Series Inserts, the Max-Bar 35° Series Tool Holders, and the 3.20-095 screw for the 35° tool holders are not specified in the Max Bar catalog. Since these items were sold by the company of which the inventor of the '400 patent was president, patent owner is in the best position to confirm or deny the accuracy of our findings in any response to this decision. The 35° tool holders have a minimum 0.375" (= 9.525 mm) square shank. We presume

that the tool inserts had an inscribed circle diameter of 5/16" = 0.312" = 7.9375 mm (like the 35° ETCO vertical inserts described *infra*). The tool inserts accept a countersunk head screw as illustrated by the cross-sectional views. We presume that the 3.20-095 screw is a 60° countersunk head screw having a thread diameter of 3.2 mm (= 1/8") and having a head diameter less than 70% of 9 mm (i.e., less than 6.3 mm).

ETCO discloses both "vertical" and "profiling" tools, which indicates that persons of ordinary skill in the machine tool art were familiar with the design features of both types of tools. ETCO discloses an SMV-50 Series "vertical" 50° tool holder with a "club foot" for tool holders with shanks from 5/16" (= 7.9 mm) square to 1" (= 25.4 mm) square (page 5), and an SMV-50 Large Series "vertical" 50° tool holder for shanks from 1" (= 25.4 mm) square to 1" (= 38.1 mm) square (page 7). The inscribed circle (IC) diameter is 0.500" for all tool holders. ETCO also discloses SMV-35 Series 35° "vertical" tool holders (page 12), which use 35° "vertical" inserts with an inscribed circle diameter of 0.312" (= 5/16" = 7.9 mm) (pages 12 and 13). When the '400 patent refers to a prior art 8 mm cutting tool and 8 mm IC diameter (col. 2, lines 1-16), it is apparently referring to

the 5/16" (= 0.312" = 7.9 mm) square shank and insert with 0.312" (= 7.9 mm) IC diameter on page 12 of ETCO. Tool holders do not require a "club foot" when the width of the shank is greater than the diameter of the inscribed circle, as evidenced by the SMV-50 Large Series tool holders. Thus, we find that one skilled in the art would have recognized that 35° tool holders 0.375" (= 9.5 mm) square and larger (i.e., having a width greater than the 0.312" = 7.9 mm IC diameter) would have uniformly square cross section shanks and recesses with tool-supporting surfaces that support the insert on two sides, as shown in the ETCO SMV-50 Large Series tool holders and the Max Bar 35° tool holder. The drawings of the inserts in ETCO indicate a countersunk fastener, but ETCO does not disclose the dimensions of the fastener or the fastener aperture.

Nikcole discloses a "vertical" tool holder and insert. The tool insert in the shape of a rhomboid (a parallelogram with unequal adjacent sides, by comparison to the insert in Fig. 4 of the '400 patent which is a rhombus). The insert fits into a recess in a tool shank having two tool-supporting surfaces, one edge of which is parallel to the side of the shank. Different tool inserts can be used for grooving or threading, and two sides of the insert extend beyond the end of the shank to form a

cutting tip. The tool shank is 8 mm square. Although the diameter of the inscribed circle is not specifically disclosed, it must be equal to or less than the insert width H = 7 mm (= 0.276"). The thickness of the lip or elongated body portion on the shank is 8 mm - 7 mm = 1 mm. The insert is mounted with a countersunk screw as indicated by the angled dashed lines in the side views of the insert and the concentric circles in the top views of the insert. The fastener is an M3x8.0 Torx screw (i.e., 3 mm in diameter by 8 mm long thread), which must have a countersunk head to fit in the countersunk aperture in the insert.

Level of ordinary skill in the art

The USPTO has no way to take testimony about the level of ordinary skill in the art. In any case, defining a person of ordinary skill in the art solely by degrees and experience does not inform us about what the hypothetical person of ordinary skill in the art knows. For these reasons, the level of ordinary skill in the art is evidenced by the references. *See In re Oelrich*, 579 F.2d 86, 91, 198 USPQ 210, 214 (CCPA 1978) ("the PTO usually must evaluate both the scope and content of the prior art and the level of ordinary skill solely on the cold words of the literature"); *In re GPAC Inc.*, 57 F.3d 1573, 1579, 35 USPQ2d 1116, 1121 (Fed.

Cir. 1995) (the Board did not err in adopting the approach that the level of skill in the art was best determined by the references of record); *Okajima v. Bourdeau*, 261 F.3d 1350, 1355, 59 USPQ2d 1795, 1797 (Fed. Cir. 2001) ("[T]he absence of specific findings on the level of skill in the art does not give rise to reversible error 'where the prior art itself reflects an appropriate level and a need for testimony is not shown.'"). In addition, the level of ordinary skill is evidenced by statements in the '400 patent. For example, the '400 patent discloses that those of ordinary skill in the art knew there was a need for small-shank tools (col. 3, lines 40-44): "'[S]mall-shank' screw machines . . . can only accommodate shanks having widths of less than 9 mm. Currently, the industry standard shank widths for such 'small-shank' machines are 7 mm and 8 mm." The '400 patent also states: "In the embodiment of the present invention illustrated, the angle B is approximately 35°; however, as will be recognized by those skilled in the pertinent art, this angle may be changed as desired depending upon the requirements of a particular cutting tool design or other machining system." ('400 patent, col. 4, lines 28-33.) Those skilled in the small-shank machine tool art were also familiar with the prior art in

Fig. 1 of the '400 patent. Skill in the art is presumed. *See In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

The references demonstrate that one of ordinary skill in the art of designing machine tools had knowledge of: (1) mounting profiling and vertical inserts in a recess in the tool shank with two sides of the insert supported by tool-supporting surfaces of the recess (Max Bar, ETCO, Nikcole, Kyocera); (2) shank widths less than 9 mm and, in particular, 7 mm and 8 mm widths ('400 patent, col. 3, lines 40-44; Kyocera and Nikcole disclose an 8 mm width shank for a profiling tool and a vertical tool, respectively); (3) 8 mm shank widths with inserts having a 7 mm inscribed circle (IC) diameter (Nikcole) or a 0.250" IC diameter (Kyocera); (4) inserts having an IC diameter less than 90% of the shank width (Max Bar, ETCO, Nikcole, Kyocera) and a fastener aperture less than 70% of the IC diameter (Max Bar, Nikcole, Kyocera); (5) mounting inserts using countersunk head screws (Max Bar, ETCO, Nikcole, Kyocera); (6) a lip thickness of at least 1 mm (Max Bar, ETCO, Nikcole, Kyocera); and (7) using inserts with a smaller IC diameter for smaller shank widths (Kyocera shows a 0.250" IC diameter for an 8 mm width and a 0.375" IC diameter for a 12 mm width). One of ordinary skill in

the machine tool art at the time of the invention had sufficient mechanical skill to apply the teachings of profiling tools to vertical tools and vice versa (e.g., ETCO teaches both types of tools).

Differences

Between Max Bar and the independent claims

Based on our presumptions that the Max Bar 35° series inserts and tool holders have a 5/16" (= 0.312" = 7.9 mm) inscribed circle diameter, and that the 3.20-095 screw has a 60° countersunk head with a diameter less than 70% of 9 mm, the only difference between the subject matter of claims 1 and 2 and Max Bar is the claimed "maximum width of less than approximately 9 mm." The minimum width of a Max Bar shank is 0.375" = 9.525 mm. If the tool shank in Max Bar had a width of about 9 mm, the other limitations of an elongated body portion thickness of at least 1 mm, an inscribed circle (IC) diameter of less than 90% of 9 mm, and a fastener aperture and a fastener head diameter less than 70% of 9 mm would all be met.

The differences between claims 10 and 11 and Max Bar are that Max Bar does not disclose: (1) a shank "having a maximum width within the range of

approximately 7 mm through 8 mm"--Max Bar has a width of 9.5 mm; (2) the "inscribed circle having a diameter within range of approximately 5.5 mm through 6.5 mm"--Max Bar has a diameter of 0.312" = 7.9 mm; (3) the "fastener aperture has a maximum diameter within the range of approximately 3 mm through 4.5 mm--Max Bar does not disclose the maximum diameter for the fastener or the aperture; and (4) a "head having a maximum diameter within the range of approximately 3 mm through 4.5 mm"--Max Bar does not disclose the head size.

Based on our interpretation that claims 16-18 are directed to the tool insert, and that the tool shank limitations are statements of intended use for the insert, we find no differences between the subject matter of claims 16-18 and Max Bar since a 35° insert with a 0.312" IC diameter is capable of being used with a tool shank having a "maximum width of less than approximately 9 mm" and will meet the other limitations of the claims. However, assuming that the tool shank is part of claims 16-18, the only difference between the claims and Max Bar is the claimed "maximum width of less than approximately 9 mm."

Between ETCO and the independent claims

One difference between the subject matter of claims 1 and 2 and ETCO is the claimed "maximum width of less than approximately 9 mm." ETCO has a width of 0.375" = 9.525 mm. If the tool shank in ETCO had a width of about 9 mm, the limitations of an elongated body portion thickness of at least 1 mm and an inscribed circle diameter of less than 90% of 9 mm would all be met. ETCO does not disclose the fastener or the fastener aperture and, thus, the other differences are that ETCO does not disclose a "fastener aperture . . . having a diameter less than approximately 70% of the diameter of the inscribed circle" and "the threaded fastener defining a head having a maximum diameter less than approximately 70% of the diameter of the inscribed circle."

The differences between claims 10 and 11 and ETCO are that ETCO does not disclose: (1) a shank "having a maximum width within the range of approximately 7 mm through 8 mm"--ETCO has a width of 9.5 mm; (2) the "inscribed circle having a diameter within range of approximately 5.5 mm through 6.5 mm"--ETCO has a diameter of 0.312" = 7.9 mm; (3) the "fastener aperture has a maximum diameter within the range of approximately 3 mm through 4.5 mm--

ETCO does not disclose the diameter of the aperture or the fastener; and (4) a "head having a maximum diameter within the range of approximately 3 mm through 4.5 mm"--ETCO does not disclose the fastener diameter or head size.

Based on our interpretation that claims 16-18 are directed to the tool insert alone, and that the tool shank limitations are statements of intended use for the insert, the only difference between the subject matter of claims 16-18 and ETCO is that ETCO does not disclose "a fastener aperture . . . having a diameter less than approximately 70% of the diameter of the inscribed circle" because ETCO does not describe the fastener or the fastener aperture, except to indicate that it is a countersunk fastener. If the tool shank in ETCO had a width of about 9 mm, the other limitations of an elongated body portion thickness of at least 1 mm and an inscribed circle diameter of less than 90% of 9 mm than would be met. However, assuming that the tool shank is part of claims 16-18, the other difference between claims 16-18 and ETCO is the claimed "maximum width of less than approximately 9 mm."

Between Nikcole and the independent claims

One difference between the subject matter of independent claim 1 and Nikcole is that Nikcole does not disclose the limitations indicated by underlining in "two sides of the insert each fully engaging a respective tool-supporting surface of the shank without any substantial portion of the two sides extending beyond the respective tool-supporting surfaces," which were added by amendment in the reexamination to define over Nikcole (Paper filed December 31, 2004). If the tool shank is given weight in independent claim 16, this is the sole difference between the subject matter of claim 16 and Nikcole. The long side of the Nikcole insert does not fully engage the tool-supporting surface and extends beyond the tool-supporting surface. The other difference between claim 1 and Nikcole is that Nikcole discloses a 3 mm countersunk head screw, but does not disclose the head diameter of the screw and, so, does not expressly teach "a head having a maximum diameter less than approximately 70% of the inscribed circle."

One difference between the subject matter of independent claim 2 and Nikcole is that Nikcole does not teach "wherein the first and second tool-supporting surfaces are oriented at an angle of approximately 35° relative to each

other." The other difference between claim 2 and Nikcole is that Nikcole discloses a 3 mm countersunk head screw, but does not disclose the head diameter of the screw and, so, does not expressly teach "a head having a maximum diameter less than approximately 70% of the inscribed circle."

One difference between the subject matter of independent claim 10 and Nikcole is that Nikcole does not disclose the limitations indicated by underlining in "two sides of the insert each fully engaging a respective tool-supporting surface of the shank without any substantial portion of the two sides extending beyond the respective tool-supporting surfaces." The other difference is that Nikcole discloses a 7 mm inscribed circle diameter, whereas claim 10 recites a diameter that is "within the range of approximately 5.5 mm through 6.5 mm." Nikcole does not disclose a "head having a maximum diameter within the range of approximately 3 mm through 4.5 mm."

One difference between the subject matter of independent claim 11 and Nikcole is that Nikcole does not teach "wherein the first and second tool-supporting surfaces are oriented at an angle of approximately 35° relative to each other." The other difference is that Nikcole discloses a 7 mm inscribed circle

diameter, whereas claim 11 recites a diameter that is "within the range of approximately 5.5 mm through 6.5 mm." Nikcole also does not disclose a "head having a maximum diameter within the range of approximately 3 mm through 4.5 mm."

The difference between the subject matter of claim 17 and Nikcole is that Nikcole does not teach the limitation "wherein the two sides of the insert engaging the tool-supporting surfaces are oriented at an angle of approximately 35° relative to each other."

The difference between the subject matter of claim 18 and Nikcole is that Nikcole does not teach the limitation "wherein the two sides of the insert extending beyond the end of the shank are oriented at an angle of approximately 35° relative to each other."

Objective evidence of nonobviousness

Objective evidence of nonobviousness (also called "secondary considerations") must always be considered in making an obviousness decision, *Stratoflex v. Aeroquip*, 713 F.2d at 1538, 218 USPQ at 879, although it need not be necessarily conclusive on the issue of obviousness, *Ashland Oil, Inc. v. Delta*

Resins & Refrac., Inc., 776 F.2d 281, 306, 227 USPQ 657, 674 (Fed. Cir. 1985). A "nexus" is required between the merits of the claimed invention and the evidence of secondary considerations in order for the evidence to be given substantial weight in an obviousness decision. *See Stratoflex*, 713 F.2d at 1539, 218 USPQ at 879. "Nexus" is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in the determination of nonobviousness. *See Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392, 7 USPQ2d 1222, 1226 (Fed. Cir. 1988). The burden of showing nexus is on the applicant or the patent owner. *See In re Huang*, 100 F.3d 135, 139-140, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996) ("In the ex parte process of examining a patent application, however, the PTO lacks the means or resources to gather evidence which supports or refutes the applicant's assertion that the sales constitute commercial success. Consequently, the PTO must rely upon the applicant to provide hard evidence of commercial success." (Citation omitted.)).

Patent owner proffers the declaration of Mr. William R. Fountaine, submitted December 31, 2004, as evidence of commercial success. Mr. Fountaine's declaration states (¶¶ 3-6):

> 3. Since 1996, Max Bar has manufactured and sold vertical toolholders having a maximum width of 7 mm or 8 mm (the "Small Shank Vertical Toolholders") and associated 35° cutting inserts (the "Vertical Inserts") covered by one or more of claims 2, 11 and 17-18 of the '400 patent.
>
> 4. Following introduction of Max Bar's Small Shank Vertical Toolholder and Vertical Inserts on April 16, 1996 through July 4, 1997, Max Bar tools sold 406 Small Shank Vertical Toolholders and 3,704 Vertical Inserts.
>
> 5. From February 2000 to October 2004, Max Bar has sold approximately 2581 Small Shank Vertical Toolholders and approximately 110,000 Vertical Inserts.
>
> 6. Because Max Bar changed its computer accounting system in February 2000, it is difficult for Max Bar to obtain exact figures for sales of the patented products between July 1997 and February 2000. It is my recollection that sales during that period were comparable to the sales from February 2000 to October 2004.

Commercial success is not proved simply by sales figures. "This court has noted in the past that evidence related solely to the number of units sold provides a very weak showing of commercial success, if any." *Huang*, 100 F.3d at 140, 40 USPQ2d at 1689; *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1151,

219 USPQ 857, 861 (Fed. Cir. 1983) (determination of obviousness not erroneous where: "The evidence of commercial success consisted solely of the number of units sold. There was no evidence of market share, of growth in market share, of replacing earlier units sold by others or of dollar amounts, and no evidence of a nexus between sales and the merits of the invention."). We find that sales figures alone are not evidence of commercial success. There is no way to tell whether the numbers are big or small in the market for such tools, whether the sales are due to price, advertising, availability, or other factors unrelated to the merits of the claimed invention.

Mr. Fountaine's declaration states (¶ 7):

> 7. The success of the Max Bar Small Shank Vertical Toolholder and Vertical Insert is due to the advantages offered by the cutting tool as a result of structure recited in claims 2, 11 and 17-18 of the '400 patent. The tool-supporting surfaces at the end of the Small Shank Vertical Toolholder provide improved support to the Vertical Insert, which allows the tool to perform a variety of cutting functions on an automatic lathe, such as front turning, back turning, cut off, threading, plunge and turning, and grooving operations. The 35° cutting insert allows the tool to be used in a fan-type automatic lathe where several cutting tools may be operating simultaneously. Because the cutting insert is fully engaged on two sides by a tool-supporting surface in the tool recess at the end of the tool shank, the tool insert is not easily dislodged, as occurred with prior art small shank vertical toolholders such as the toolholder shown in Fig. 1 of the '400 patent.

This is merely a conclusory assertion that there is a nexus between the merits of the tool holder and tool insert and the commercial success, which is not persuasive. *See Huang*, 100 F.3d at 140, 40 USPQ2d at 1690 ("Huang's affidavit contains a conclusory assertion that, in his opinion, the sales of the grips derive from the increased thickness of the polyurethane layer and the alignment of the pores. This merely represents the inventor's opinion as to the purchaser's reason for buying the product, and, alone is insufficient. Instead, the applicant must submit some factual evidence that demonstrates the nexus between the sales and the claimed invention - for example, an affidavit from the purchaser explaining that the product was purchased due to the claimed features."). The tool holders in Kyocera, Max Bar, ETCO, and Nikcole all have two tool-supporting surfaces, so commercial success cannot be due to this factor. Max Bar and ETCO teach a 35° insert, so this angle cannot be responsible for the commercial success. The claims do not positively recite a vertical tool holder and vertical insert, or the operations performed by the tool, which might indirectly require a vertical tool, so this aspect of nexus is missing. In any case, Max Bar, ETCO, and Nikcole teach a vertical

tool holder and vertical insert where the insert is supported on two sides by tool-supporting surfaces.

For these reasons, the declaration of commercial success is not entitled to any weight in the obviousness determination.

We have further considered the declaration of Mr. Fountaine dated June 3, 1997, which was submitted during the prosecution of the '400 patent. The statements regarding commercial success (¶¶ 10-14) are not entitled to any weight for the reasons stated in connection with the December 31, 2004, declaration.

Patent owner also argues that copying by others is further evidence of nonobviousness (Br13-14). "[M]ore than the mere fact of copying by an accused infringer is needed to make that action significant to a determination of the obviousness issue." *Cable Elec. Prods., Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1028, 226 USPQ 881, 889 (Fed. Cir. 1985) (discussing why copying is not necessarily evidence of nonobviousness). In addition, patent owner has provided no showing of "nexus" between the copying arguably shown and the nonobviousness of the claimed invention. *Id.* No weight is given to the argument about copying.

Analysis

"In determining whether a combination of old elements is non-obvious, the court must assess whether, in fact, an artisan of ordinary skill in the art at the time of invention, with no knowledge of the claimed invention, would have some motivation to combine the teachings of one reference with the teachings of another reference." *Cross Medical Products, Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1321, 76 USPQ2d 1662, 1684 (Fed. Cir. 2005). "[T]he best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine the references." *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). The Board must articulate the reasons why one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). Motivation may be found expressly or implicitly in the references. *Id.* at 987-88, 78 USPQ2d at 1336. "[T]he 'motivation-suggestion-teaching' test asks not merely what the references disclose, but whether a person of ordinary skill in the art, possessed with the

understandings and knowledge reflected in the prior art, and motivated by the general problem facing the inventor, would have been led to make the combination recited in the claims." *Id.* at 988, 78 USPQ2d at 1337. Motivation to combine references "may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Whether there is motivation to combine the references is a question of fact drawing on the factors of *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). *See McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) (motivation is not limited to the first *Graham* factor); *Kahn*, 441 F.3d at 986, 78 USPQ2d at 1335 ("[Motivation] entails consideration of both the 'scope and content of the prior art' and 'level of ordinary skill in the pertinent art' aspects of the *Graham* test.").

The problem facing the inventor was the design of small-shank vertical tools having interchangeable tool inserts for an automatic lathe, where "small-shank" refers to shanks having a width of less than approximately 9 mm, and preferably

7 mm or 8 mm. One known prior art approach for an 8mm is described in connection with Fig. 1 (col. 2, lines 6-16):

> As can be seen, the tool insert 3 is defined by an inscribed circle which is approximately equal to the width of the shank 2 (8 mm), and the shank defines a single tool-supporting edge 5 for engaging and supporting a corresponding edge of the tool insert. One of the problems encountered with this configuration is that if the insert is torqued in the clockwise direction in FIG. 1, the tool insert may become relatively easily dislodged on the shank, thus rendering the cutting tool ineffective and requiring time-consuming breakdowns and set-up to either repair or replace the tool.

The solution in the '400 patent is to form a recess in the end of the shank which supports two sides of the rhomboidal-shaped insert. The insert has an inscribed circle diameter less that approximately 90% of the shank width so that the thickness of a lip 24 that supports one side of the insert is at least 1 mm to provide structural integrity to fixedly support the tool insert during machining operations (col. 4, lines 41-56). The fastener has a countersunk head and the maximum diameter of the head and the maximum diameter of the countersunk aperture is less than 70% of the inscribed circle diameter to maintain the structural integrity of the insert (col. 4, line 60, to col. 5, line 20). The issue is whether one of ordinary skill in the art, having the references before him or her, would have arrived at the claimed solution. The inventor is not a hypothetical person of ordinary skill in the

art and therefore is not presumed to be aware of all prior art solutions to the problem.

To simplify the analysis, we assume that the claims are directed to vertical tools and that claims 16-18 require the tool shank in combination with a tool insert. There are at least three ways to approach the motivation and obviousness question.

(1)

First, one of ordinary skill in the machine tool art seeking to design a small-shank tool having a width of approximately 9 mm, as recited in claims 1, 2, and 16-18, would have been motivated to simply reduce the 0.375" (= 9.5 mm) width of the shanks in Max Bar or ETCO to 9 mm, since these claims do not require any change in dimension of the 0.312" (= 7.9 mm) inscribed circle diameter. Although we consider that the problem suggests the solution to one of ordinary skill in the art, Nikcole and Kyocera also would have informed those of ordinary skill in the art that a shank with a width smaller than 9.5 mm and having the insert supported by two surfaces of a recess was a known solution to making a small-shank tool. The only limitations not expressly met would be the dimensions of the fastener aperture and the fastener head diameter, because they are not

disclosed. However, one skilled in the art would have been motivated to use any known insert mounting arrangement for small shank tools, such as the 2.5 mm countersunk head screw taught in the profiling tool of Kyocera, which would meet these limitations. One of ordinary skill in the art had sufficient knowledge of the design of profiling and vertical tools to apply the fastener and mounting teachings of one to the other.

We have determined that the declaration of commercial success by the inventor Mr. Fountaine submitted December 31, 2004, and the portion of Mr. Fountaine's declaration of June 3, 1997, dealing with commercial success (¶¶ 10-14) are not entitled to any weight. We have also determined that counsel's argument about copying by others is not entitled to any weight. Mr. Fountaine's declaration of June 3, 1997, contains the following statements why the claimed invention would not have been obvious:

> 8. Based on my experience and knowledge in the machine tool industry, despite the clear problems of the prior art brazed, club foot and other small-shank tools, there were several factors dictating against the solution of my invention. The carbide insert and the end of the shank supporting the insert are subjected to tremendous forces during machining operations. In light of this, I was concerned (as I believe were others in the industry) that constructing an insert with reduced dimensions as recited in the claims would substantially weaken the insert and fail to provide the

requisite structural integrity for performing all machining operations. There was also a concern that reducing the size of our insert, and reducing the width of the portion of the shank holding the insert (in comparison to the prior art club-foot small-shank tools) would provide insufficient surface area engaging the sides of the insert in order to fixedly secure the insert during all machining operations. In addition, there was also a concern that reducing the dimensions of the inserts in the manner claimed would cause the tool to fail to provide a sufficient depth of cut. Moreover, I was concerned that reducing the dimensions of an insert in the manner claimed would cause the insert to have insufficient locating surface area, and that the insert would fracture under the necessary torque that would be applied to the screw when attaching the insert to the shank.

9. In light of these and possibly other concerns, the machine tool industry had in the past taken a quite different approach to constructing small-shank tools than that of my invention. Rather than reduce the dimensions of the insert, and construct the insert and shank having the relative dimensions as recited in the claims, the machine tool industry either (i) expanded the dimensions of the shank as in the club foot tool to support a large insert, (ii) secured a relatively large insert to the shank having a width equal to the inscribed circle of the insert, as shown in Fig. 1 in the application, or (iii) brazed the carbide tool bit to the end of the shank. In each case, the machine tool industry refused to provide an insert having reduced dimensions and, in effect, took an approach opposite to that of my invention. In light of this, it was simply not obvious to those of ordinary skill in the machine tool industry construct a small-shank tool as recited in the claims of my application.

These statements are not persuasive as to the present rejection of claims 1, 2, 8, 9, and 16-18 because these claims do not require any modification of the 0.312" (= 7.9 mm) inscribed circle diameter in Max Bar and ETCO. Reducing the width

of the prior art shanks in Max Bar and ETCO from 9.5 mm to "less than approximately 9 mm" does not require reducing the inscribed circle diameter and would still provide a lip of 9 mm - 7.9 mm = 1.1 mm. The fact that the prior art taught other solutions, such as a club foot or a shank having a width equal to the inscribed circle diameter of the insert does not teach away from the claimed solution.

Thus, claims 1, 2, 8, 9, and 16-18 are unpatentable over Max Bar or ETCO.

(2)

Second, a more comprehensive approach is to address the obviousness of the narrower claims requiring an 8 mm shank width, such as independent claims 10 and 11, which will then satisfy the broader claims requiring a width of approximately 9 mm. One of ordinary skill in the machine tool art seeking to design an 8 mm small-shank tool that overcomes the problem of the prior art 8 mm tool in Fig. 1, would have been motivated to scale down the 9.5 mm square tool shank and insert with a 0.312" (= 7.9 mm) inscribed circle (IC) diameter in either Max Bar or ETCO to provide an 8 mm square shank and a 7 mm IC diameter insert as taught in the vertical tool in Nikcole or an 8 mm square shank and an 0.250" IC

diameter insert as taught in the profiling tool in Kyocera. The motivation is found in the express teachings of the references. The person of ordinary skill in the art was familiar with the mounting of inserts for profiling and vertical tools and therefore the teachings of Kyocera are directly applicable to vertical tools; the mounting of vertical and profiling tools are so similar and simple that this finding cannot be reasonable challenged. In addition, one of ordinary skill in the art had sufficient knowledge and skill to apply the insert mounting technique for large shank tools (10 mm and greater) to small shank tools by simply reducing both the width of the shank and the IC diameter; this knowledge is expressly taught in Kyocera which discloses a 12 mm width large shank with a 3/8" IC diameter insert and an 8 mm width small shank with a 1/4" IC diameter. One of ordinary skill in the art would have been motivated to use the same fasteners as taught in Nikcole or Kyocera because this involves mere copying.

For simplicity, we rely on the modification of Max Bar or ETCO in view of Kyocera because Kyocera's 0.250" (= 6.35 mm) IC diameter is within the "range of approximately 5.5 mm through 6.5 mm" of claims 4, 10, 11, and 19, and because its mounting screw is fully described. The 7 mm IC diameter of Nikcole is slightly

outside the 5.5 mm through 6.5 mm range (although it is still less than 90% of the shank width as recited in claims 1, 2, and 16-18, and '400 patent provide no reason for the 6.5 mm dimension) and the screw in is not described.

Modification of Max Bar or ETCO to provide an 8 mm width shank and a 0.250" IC diameter insert as taught by Kyocera meets the shank width limitation of "less than approximately 9 mm," an elongated body portion having "a thickness of at least approximately 1.0 mm," and an insert having "an inscribed circle having a diameter less than approximately 90% of the shank width," as recited in claims 1, 2, and 16-18. These dimensions also satisfy the limitations of a shank having "a width of either 7 mm or 8 mm," as recited in claim 3, and "an axially-elongated body portion . . . having a thickness of at least approximately 1.0 mm" and a maximum shank width "within the range of approximately 7 mm through 8 mm," as recited in claims 4, 5, 10, and 11. Max Bar and ETCO both teach 35° inserts satisfying the 35° limitations of claims 2, 11, 17, and 18; the tool shank having a planar outer surface, as recited in claims 8 and 14; and the outer surface of the insert being substantially coplanar with the outer surface of the tool shank, as recited in claims 9 and 15.

Kyocera teaches a 2.5 mm diameter 60° countersunk screw for mounting a profiling insert with a 0.250" IC diameter. The screw head has a maximum width of 0.14" (= 3.56 mm), which is 56% of the IC diameter. The maximum fastener aperture would be approximately equal to the head diameter so that the head fully bears against the countersink. Although Kyocera is a profiling tool, one of ordinary skill in the machine tool art had sufficient skill to apply teachings of profiling tools to vertical tools and vice versa, especially since the mounting of profiling inserts, as in Kyocera, and vertical inserts, as in Max Bar and ETCO, are so similar. It is noted that the preferred embodiment of the '400 patent uses a 2.5 mm screw (col. 5, lines 39-42). The fastener aperture and fastener in Kyocera meet the limitations of a fastener aperture having a "diameter less than approximately 70% of the diameter of the inscribed circle," as recited in claims 1, 2, and 16-18; a threaded fastener head "having a maximum diameter less than approximately 70% of the diameter of the inscribed circle," as recited in claims 1 and 2; and a fastener aperture with a "maximum diameter within the range of approximately 3 mm through 4.5 mm," and a countersunk head "having a maximum diameter within the range of approximately 3 mm through 4.5 mm," as

recited in claims 5, 10, and 11. The 60° countersink angle of the head meets the limitation of "approximately 52° through 68°" in claims 6 and 12, and the particular angle of "60°" in claims 7 and 13.

Again, the arguments about commercial success and copying have been considered, but are not entitled to any weight. Mr. Fountaine's statements in ¶¶ 8-9 of the declaration of June 3, 1997, are more relevant to the present rejection because the present rejection relies on reducing the dimensions of the insert. However, Nikcole and Kyocera demonstrate that one of ordinary skill in the art knew that a tool shank and tool insert with the dimensions claimed would work. Therefore, Mr. Fountaine's declaration is not persuasive.

Accordingly, modification of Max Bar or ETCO to provide an 8 mm width shank and 0.250 IC diameter insert and 2.5 mm diameter 60° screw as taught by Kyocera makes obvious the subject matter of claims 1-19.

(3)

Third, one of ordinary skill in the machine tool art seeking to design an 8 mm vertical small-shank tool that overcomes the problem of the prior art 8 mm tool in Fig. 1, would have been motivated to start with a known solution as taught

by the 8 mm vertical tool in Nikcole. A person of ordinary skill in the art having Nikcole, Max Bar, and ETCO before him or her, would have been motivated to modify Nikcole to use inserts which fully engage the tool-supporting surfaces of the recess without any substantial portion of the two sides extending beyond the tool-supporting surfaces, as recited in claims 1, 10, and 16, given the express teachings of this configuration in Max Bar and ETCO. A person of ordinary skill in the art having Nikcole, Max Bar, and ETCO before him or her, would have been motivated to modify Nikcole to use 35° inserts in a 35° recess, as recited in claims 2, 11, 17, and 18, given the express teachings of 35° vertical inserts in Max Bar and ETCO. It is not required that the advantages of the design of 35° inserts which fully engage the sides be described in the references to establish motivation: it is sufficient that Max Bar and ETCO teach that the features were known. Since the inventor was the president of Max Bar, he would have been aware of the technical advantages of the design.

Nikcole must have an inscribed circle diameter equal to or less than the 7 mm width of the tool insert. This meets the limitations of an "inscribed circle having a diameter less than approximately 90% of the shank width," as recited in

claims 1, 2, and 16-18. Nikcole's 7 mm inscribed circle diameter does not fall within the "range of approximately 5.5 mm through 6.5 mm," as recited in claims 4, 10, 11, and 19. However, one of ordinary skill in the art would have been motivated to make a narrower insert with a 0.250" inscribed circle diameter given the express teachings of Kyocera. One of ordinary skill in the art had sufficient knowledge to appreciate that a smaller inscribed circle diameter would provide a thicker and stronger lip on the tool shank. The '400 patent does not give any reason why 6.5 mm, in particular, is critical.

Nikcole uses a 3 mm countersunk head screw, but does not disclose the details of the screw. One of ordinary skill in the art would have been motivated to use a known 3 mm screw in Nikcole, such as the 3 mm 60° countersunk head screw with a 0.17" (= 4.32 mm) diameter head shown in the Kyocera table. The maximum fastener aperture would be approximately equal to the head diameter so that the head fully bears against the countersink. Thus, the 3 mm screw taught by Kyocera would satisfy the limitation of a fastener aperture having a "diameter less than approximately 70% of the diameter of the inscribed circle," as recited in claims 1, 2, and 16-18; a threaded fastener head "having a maximum diameter less

than approximately 70% of the diameter of the inscribed circle," as recited in claims 1 and 2; and a fastener aperture with a "maximum diameter within the range of approximately 3 mm through 4.5 mm," and a countersunk head "having a maximum diameter within the range of approximately 3 mm through 4.5 mm," as recited in claims 10 and 11, and 5. The 60° countersink angle of the head meets the limitation of "approximately 52° through 68°" in claims 6 and 12, and the particular angle of "60°" in claims 7 and 13.

Again, the arguments about commercial success and copying have been considered, but are not entitled to any weight. Mr. Fountaine's statements in ¶¶ 8-9 of the declaration of June 3, 1997, are not persuasive as to the present rejection because the present rejection relies on Nikcole and Kyocera, which teach that an 8 mm shank width and an insert with an IC diameter smaller than the shank width so as to provide an elongated body portion of at least 1 mm will, in fact, work. Therefore, Mr. Fountaine's declaration is not persuasive.

Accordingly, the subject matter of claims 1-19 would have been alternatively obvious over the combination of Nikcole as modified in light of Max Bar, ETCO, and Kyocera .

CONCLUSION

The rejections of claims 16-19 are sustained

The rejections of claims 1-15 are reversed.

A new ground of rejection is entered as to claims 1-19 under 35 U.S.C. § 103(a).

This decision contains new grounds of rejection pursuant to 37 CFR § 41.50(b) (2005). 37 CFR § 41.50(b) provides that "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 CFR § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (2004).

AFFIRMED-IN-PART - 37 CFR § 41.50(b)

LEE E. BARRETT Administrative Patent Judge	)	
	)	BOARD OF PATENT
JAMESON LEE Administrative Patent Judge	)	APPEALS AND INTERFERENCES
JAMES T. MOORE Administrative Patent Judge	)	

Attachments to opinion:

(1) Kyocera catalog, published September 5, 1993 (Exhibit 6 of the request for reexamination), cover and pages 2-6 and 11 ("Bates" numbered E613-618 and E623). The insert screws noted in the tables on page 6 of the catalog are shown in a Kyocera engineering drawing and catalog page (Exhibit 7 of the request for reexamination).

(2) Kennametal catalog, published 1994 (Exhibit 8 of request for reexamination), cover ("Bates" numbered E151) and pages 5 ("Bates" numbered E155) and 16 ("Bates" numbered E166).

(3) "Tool Holders and Inserts for CNC 'Swiss-Type' Automatics" catalog, Max Bar (1992) (of record in '400 patent).

(4) "Mini-Shank Tooling Indexable Inserts" catalog, Engineered Tooling Corp. (ETCO) (1990) (of record in '400 patent).

(5) "Nikcole Mini-Thin™ Grooving and Cutoff System" catalog, Nikcole, Inc. (August 1992) (Exhibit 4 to request for reexamination).

(6) Declaration of the inventor William Fountaine, dated July 3, 1997, in Application 08/632,347 (Exhibit 3 to request for reexamination)

(7) Declaration of the inventor William Fountaine, dated December 31, 2004, in Reexamination Control No. 90/006,360.

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