

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JEREMY R. BERNARD,  
DONALD R. VAN DER MOERE, and  
JOHN L. CAGNEY

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Appeal 2008-2609  
Application 10/979,826  
Technology Center 3700

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Decided: November 5, 2008

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Before HUBERT C. LORIN, DAVID B. WALKER, and  
JOSEPH A. FISCHETTI, *Administrative Patent Judges*.

LORIN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Jeremy R. Bernard, et al. (Appellants) seek our review under 35 U.S.C. § 134 of the final rejection of claims 1-12. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

## SUMMARY OF DECISION

We AFFIRM.<sup>1</sup>

### THE INVENTION

The “invention relates to powertrains of motor vehicles and is particularly concerned with the use of self-tapping fasteners to create certain critical joints in certain parts.” Specification [0001]. In particular, the claimed invention is directed to fastening components at critical joints in a motor vehicle powertrain with helically threaded screws having multi-lobed leads capable of starting the screws in unthreaded holes.

Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. A method for fastening components together at critical joints in a motor vehicle powertrain through which power flows from an engine to driven wheels, the method comprising: providing an unthreaded hole in a first component part, providing a clearance hole in a second component part, passing a helically threaded screw that has a multi-lobed lead capable of starting the screw in an unthreaded hole in the first component part through the clearance hole in the second component part to engage the multi-lobed lead with the unthreaded hole in the first component part and turning the screw, with an axial force applied, to start the screw in the unthreaded hole, and continuing to turn the screw to cause threads that are distal to the lead to

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<sup>1</sup> Our decision will make reference to the Appellants’ Appeal Brief (“App. Br.,” filed Jun. 26, 2007) and Reply Brief (“Reply Br.,” filed Oct. 11, 2007), and the Examiner’s Answer (“Answer,” mailed Aug. 13, 2007).

create a desired helical thread in the unthreaded hole, wherein the final thread engagement is at least 1.5 times the diameter of the screw thread.

### THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Muenchinger                      US 3,877,339                      Apr. 15, 1975

Research Engineering & Manufacturing Inc., "TAPTITE 2000® Thread Rolling Fasteners," 2001, pp. 1-9.

Applicant's Admitted Prior Art as set forth in the Specification at p. 2, [0004].

The following rejections are before us for review:

1. Claims 1-8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Muenchinger and TAPTITE 2000®.
2. Claims 1-12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art, Muenchinger, and TAPTITE 2000®.

### ISSUE

The issue is whether it would have been obvious to use known helically threaded screws with multi-lobed leads to fasten components together at critical joints in a motor vehicle powertrain.

## FINDINGS OF FACT

We find that the following enumerated findings of fact (FF) are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

### *Claim construction*

1. The preamble of claim 1 calls for “fastening components together at critical joints in a motor vehicle powertrain through which power flows from an engine to driven wheels.”
2. The body of claim 1 describes the method as comprising providing an unthreaded hole in a first *component*, providing a clearance hole in a second *component*, and “passing a helically threaded screw that has a multi-lobed lead capable of starting the crew in an unthreaded hole in the first component part through the clearance hole in the second component part.”
3. The Specification defines a critical joint in the powertrain as follows: “A joint connecting parts in a motor vehicle powertrain is a critical joint if failure of the joint would damage the powertrain in a way that would render the powertrain incapable of propelling the vehicle.” Specification [0004].
4. The Specification describes using screws at the joint of a connecting rod and crankshaft throw. Spec. [0004].

*The scope and content of the prior art*

5. According to the Examiner, Muenchinger discloses fastening components at joints with helically threaded screws having multi-lobed leads in the manner claimed. Answer 3.
6. The Appellants do not challenge the Examiner's characterization of the scope and content of Muenchinger. Rather, the Appellants have argued that Muenchinger does not disclose or suggest applying Muenchinger's fastening technique to *critical joints of components of a vehicle powertrain*.
7. According to the Examiner, TAPTITE 2000® shows a screw with a final thread engagement of at least two times the diameter of the screw thread. Answer 5.
8. The Appellants do not challenge the Examiner's characterization of the scope and content of TAPTITE 2000®.
9. The Appellants admit that the screw used in the claimed invention is not new. "The screw that is used in practice of the present invention is admittedly not new." App. Br. 6.
10. The Specification admits that critical joints of components of a vehicle powertrain are known and are known to be connected via screws. According to the Specification, "[t]he various components through which power flows from the engine cylinders to the driven wheels are connected in succession from the pistons to the driven wheels. Certain connections use threaded fasteners, such as screws, to form the joint that connects one component to the next." [0004].
11. According to the Specification, "[w]here screws are used in creating such joints, the historical practice has been to drill, ream,

and then tap each hole into which a screw is to be threaded.

Drilling and tapping are separate devoted operations in the manufacturing process. Such tapping of a hole that is used to joining parts at a critical joint has been accepted as necessary in order to assure integrity of the joint over its design life.” [0005].

12. The Specification makes the following statements: “One example of a self-tapping screw that is suitable for purposes of the invention incorporates technology licensed under the trade name TAPTITE® or the trade name TAPTITE 2000®” ([0008]); “The screws are effective to roll threads in unthreaded holes as the screws are being turned into the holes” ([0009]; and “The screw thread is multi-lobular, such as the tri-lobular threads of screws incorporating TAPTITE® or TAPTITE 2000® technology” ([0022]).

*Any differences between the claimed subject matter and the prior art*

13. The claimed invention combines elements separately disclosed in Appellants’ Admitted Prior Art, Muenchinger, and TAPTITE 2000®.

*The level of skill in the art*

14. Neither the Examiner nor the Appellants has addressed the level of ordinary skill in the pertinent art of joining critical powertrain components. We will therefore consider the cited prior art as representative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (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”’).(Quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

15. One of ordinary skill in the art would understand that failure of the connection between a connecting rod and crankshaft throw will damage the powertrain in a way that would render the powertrain incapable of propelling the vehicle.

*Secondary considerations*

16. There is no evidence on record of secondary considerations of non-obviousness for our consideration. However, the Appellants contend that using the TAPTITE® screws to “fasten[ ] components together at critical joints in a motor vehicle powertrain through which power flows from an engine to driven wheels” (claim 1) produces cost efficiencies. See App. Br. 7.

## PRINCIPLES OF LAW

*Obviousness*

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). See also *KSR*, 127 S.Ct. at 1734 (“While the sequence

of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”) The Court in *Graham* further noted that evidence of secondary considerations “might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” 383 U.S. at 17-18.

### ANALYSIS

*The rejection of claims 1-8 under 35 U.S.C. §103(a) as being unpatentable over Muenchinger and TAPTITE 2000®.*

The Appellants argued claims 1-8 as a group (App. Br. 5-7). We select claim 1 as the representative claim for this group, and the remaining claims 2-8 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2007).

The Examiner finds that Muenchinger discloses fastening components at critical joints with helically threaded screws having multi-lobed leads in the manner claimed. Answer 3. The Examiner states that “[t]he joint made by the assembly of Muenchinger can be considered a critical joint applicable to a vehicle powertrain.” Answer 4 [citing Muenchinger, col. 3, l. 5-col. 4, l. 29, and Figs. 1-5]. TAPTITE 2000® shows the claimed screw and is not in dispute. FF 7 and 11.

The Appellants do not dispute the Examiner’s characterization of the manner in which Muenchinger uses its screws to fasten components. FF 5. Rather, the Appellants argue that Muenchinger does not show the critical joints applicable to a vehicle powertrain which the claimed invention fastens with TAPTITE 2000® screws. App. Br. 6.

We agree with the Appellants. Neither a powertrain nor critical joints is disclosed or suggested in Muenchinger, let alone critical joints applicable

to a vehicle powertrain. Without the prior art disclosing or suggesting this essential limitation of the claims, we are unable to find that one of ordinary skill in the art would be lead from the prior art combination to the claimed use of the TAPTITE 2000® screws to fasten components together at *critical joints in a motor vehicle powertrain*. Accordingly, we will reverse the rejection because we find a prima facie case of obviousness has not been established.

We note that the Examiner had responded to the Appellants' argument by stating that the claimed limitation "critical joints in a motor vehicle powertrain through which power flows from an engine to driven wheels" appeared in the preamble of the claim and thus "has not been given patentable weight because the recitation occurs in the preamble." Answer 10. The Appellants have taken issue with that construction of the claim. See Reply Br. 2. We do likewise.

All limitations in a claim, whether they appear in a preamble or in the body of the claim, must be considered. The patentably consequential weight to be given limitations appearing in a preamble depends on whether, after careful consideration of the whole claim, the preamble limits the claim. "In considering whether a preamble limits a claim, the preamble is analyzed to ascertain whether it states a necessary and defining aspect of the invention, or is simply an introduction to the general field of the claim. In *Kropa v. Robie*, 187 F.2d 150, 152 (CCPA 1951), the court aptly described the inquiry as whether the preamble is 'necessary to give life, meaning and vitality to the claims or counts.'" *On Demand Machine Corp. v. Ingram Industries, Inc.*, 442 F.3d 1331, 1343 (Fed. Cir. 2006). When claim 1 is considered as a whole, it becomes evident that the preamble is not simply an

introduction to the general field of the claim. In the body of the claim, the term “component” is used. The antecedent basis for “component” is in the preamble, and thus one is lead to the preamble to understand the context within which “component” is to be read. When read in light of the preamble, it becomes clear that the claimed method as a whole is referring to a component that forms part of a critical joint in a motor vehicle powertrain and that it is to this critical joint that the screws are to be used to fasten the components. Here, the preamble is “necessary to give life, meaning and vitality to the claims” and must not only be considered but must also be viewed as limiting the scope of the claim.

*The rejection of claims 1-12 under 35 U.S.C. §103(a) as being unpatentable over Applicant’s Admitted Prior Art, Muenchinger, and TAPTITE 2000®.*

Although the Appellants have grouped claims 9-12 separately from claims 1-8, the argument made with respect to them is the same as that made in challenging the rejection of claims 1-8. Claims 9-12 refer to specific joints in a vehicle powertrain but the Appellants have conceded these joints are known. App. Br. 8. The Appellants do not concede that these joints are “critical,” the same point raised in arguing against the rejection of claims 1-8. Accordingly, we will treat claims 1-12 together, using claim 1 as representative of the group..

This rejection differs from the previous one in that the Examiner has added Applicant’s Admitted Prior Art as a prior art reference. The Examiner cites the Applicants’ Admitted Prior Art for its disclosure that fastening components together at critical joints in a motor vehicle powertrain is known. In combining the Applicants’ Admitted Prior Art with Muenchinger

and TAPTITE 2000®, the Examiner fills the gap in the evidence supporting the previous rejection due to the failure of the evidence to show components at critical joints in a motor vehicle powertrain.

It is now established that fastening of components of a powertrain with screws is known. FF 9. It has been established *supra* that the particular screws used in the claimed process are known. And finally the Examiner's characterization of Muenchinger as describing connecting components with the claimed screws by the steps claimed has not been challenged.

Accordingly, the cited prior art shows all the claimed limitations. The only issue is whether it would have been obvious to one of ordinary skill in the art to use the known screws to fasten the components together at "critical" joints in a motor vehicle powertrain.

The Appellants do not argue that components in a motor vehicle powertrain are known. This is admitted to be known. App. Br. 7. The Appellants argue instead that fastening at "critical" joints for the components of the vehicle powertrain are not known. App. Br. 8. See also Reply Br. 2-4. We do not find this argument persuasive.

The Specification defines "critical" joints as follows: "A joint connecting parts in a motor vehicle powertrain is a critical joint if failure of the joint would damage the powertrain in a way that would render the powertrain incapable of propelling the vehicle." FF 3. But such a joint is known, as is fastening components at such a joint. The Specification describes using screws at the joint of a connecting rod and crankshaft throw. FF 4. This is necessarily a "critical" joint. One of ordinary skill in the art would understand that failure of the connection between a connecting rod and crankshaft throw will damage the powertrain in a way that would render

the powertrain incapable of propelling the vehicle. FF 15. Accordingly, the joint of a connecting rod and crankshaft throw represents a known “critical joint” and the fact that it was known to use fastening screws at that critical joint refutes the Appellants’ argument that fastening components at “critical” joints of a vehicle powertrain was not known.

Given that the references describe each and every limitation, the question now becomes whether it would have been obvious to substitute the claimed known screws (e.g., TAPTITE 2000®) for the screws normally used to fasten components at critical joints of a vehicle powertrain (Applicant’s Admitted Prior Art) in the manner Muenchinger describes. The evidence leads us to the conclusion that it would be.

The claimed combination appears to do no more than combine known elements for their known functions to yield, predictably, a mechanical assembly of the components at critical joints of a vehicle powertrain. One anticipated advantage, as the Examiner pointed out (Answer 8), would be an “excellent” mechanical assembly (*see* TAPTITE 2000®, p. 2). Accordingly, the Examiner has articulated an apparent reason with logical underpinning for the conclusion of obviousness. We find that the Examiner has established a prima facie case of obviousness. For the foregoing reasons, we are not persuaded as to error in the Examiner’s rejection. In general, when old elements, each performing the same function it had been known to perform, are combined and the combination yields no more than what one would expect, the combination is obvious. See *KSR* at 1740 (“Finally, in *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 96 S.Ct. 1532, 47 L.Ed.2d 784 (1976), the Court derived from the precedents the conclusion that when a patent “simply arranges old elements with each performing the same function it had been

known to perform” and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282, 96 S.Ct. 1532.”)

We note that the Appellants have argued secondary considerations; that is, cost efficiencies from fastening components at critical joints of a vehicle powertrain in the manner claimed. App. 6-7. A prima facie case of obviousness may be overcome by a showing of unexpected results. See *KSR* at 1739-1740 (“In *United States v. Adams*, 383 U.S. 39, 40, 86 S.Ct. 708, 15 L.Ed.2d 572 (1966), a companion case to *Graham*, the Court considered the obviousness of a “wet battery” that varied from prior designs in two ways: It contained water, rather than the acids conventionally employed in storage batteries; and its electrodes were magnesium and cuprous chloride, rather than zinc and silver chloride. The Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result. 383 U.S., at 50-51, 86 S.Ct. 708. It nevertheless rejected the Government's claim that Adams's battery was obvious. . . . The fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams's design was not obvious to those skilled in the art.”) However, here, the showing of unexpected results, i.e., cost efficiencies from employing the claimed process as opposed to the prior art process, is simply the attorney's argument. There is no independent corroboration for this argument. We find no evidence supporting appellants' contentions elsewhere in the record. See *In re Glass*, 474 F.2d 1015, 1019 (CCPA 1973) (“Appellant has not shown that the corresponding elements in Childs do not actually possess the same characteristics as his apparatus and since he has failed to do so, we are

required to affirm the rejection. *In re Ludtke*, 441 F.2d 660, 58 CCPA 1159 (1971).” “It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements ...[do] not suffice.” *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). Moreover, cost efficiencies appear to be the very result one would expect if the cited prior art were read as a whole. TAPTITE 2000® states that using its “fasteners afford end-users with enhanced opportunities to reduce the overall Cost of Assembly” (p. 2). Accordingly, we do not find the alleged cost savings to be sufficient evidence to overcome the prima facie case of obviousness.

We will therefore affirm the rejection.

#### CONCLUSIONS OF LAW

We conclude that the Appellants have shown that the Examiner erred in rejecting claims 1-8 under 35 U.S.C. §103(a) as being unpatentable over Muenchinger and TAPTITE 2000® but have not shown that the Examiner erred in rejecting claims 1-12 under 35 U.S.C. §103(a) as being unpatentable over Applicant’s Admitted Prior Art, Muenchinger, and TAPTITE 2000®.

#### DECISION

The decision of the Examiner to reject claims 1-12 is affirmed.

#### AFFIRMED

vsh

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