

The opinion in support of the decision being entered today  
is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* STUART PACE, MEDI MOSTAFA HAFEZ,  
MARIA-LAURA KOSIDOWSKI, ROBERT BARBOUR,  
and ALAN MARK SCHILOWITZ<sup>1</sup>

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Appeal 2007-1483  
Application 10/344,390

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Decided: 27 September 2007

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Before ADRIENE LEPIANE HANLON, MICHAEL P. TIERNEY, and  
JAMES T. MOORE, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF CASE

The Appellants appeal under 35 U.S.C. § 134 from a final rejection of claims 11 and 13-29, all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

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<sup>1</sup> The real party in interest is ExxonMobil Research and Engineering Company.

The Appellants' invention is directed to a method for reducing wear in an internal combustion engine that runs on a low sulfur content gasoline fuel by lubricating the engine with a low phosphorus content lubricating oil composition.

Claim 11, the only independent claim on appeal, reads as follows:

A method for reducing wear in an internal combustion engine running on a gasoline fuel having a sulfur content of less than 10 ppm by weight said method comprising lubricating said engine using a lubricating oil composition which has a phosphorus content of no more than 0.05 % by weight.

The Examiner relies on the following evidence in rejecting the claims on appeal:

Waddoups	U.S. Patent 6,074,993	Jun. 13, 2000
Lesieur	U.S. Patent 6,129,835	Oct. 10, 2000
Welstand	U.S. Patent 6,383,236 B1	May 7, 2002
Colclough	EP 0 280 579 A2	Aug. 31, 1988
Colclough	EP 0 280 580 A2	Aug. 31, 1988

## B. ISSUES

Have the Appellants sustained their burden of showing that the Examiner erred in rejecting claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Waddoups in combination with Lesieur or Welstand?

Have the Appellants sustained their burden of showing that the Examiner erred in rejecting claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Colclough 579 or Colclough 580 in combination with Lesieur or Welstand?

C. FINDINGS OF FACT

The following findings of fact are supported by a preponderance of the evidence. Additional findings of fact as necessary appear in the Analysis portion of the opinion.

1. Colclough 579

Colclough 579 discloses lubricant compositions, especially automobile crankcase lubricants, containing low or zero amounts of phosphorous. Colclough 579 at 2:3-4.

The disclosed lubricant compositions contain small amounts of phosphorous, i.e., less than 0.05 weight percent, preferably less than 0.01 weight percent, more preferably less than 0.005 weight percent, but more preferably the lubricating compositions are substantially free of phosphorus. Colclough 579 at 4:32-34.

Colclough 579 provides examples of the invention as well as comparative examples. Colclough 579 at 6:55-7:21.

Colclough 579 explains that the results reported in these examples show that the lubricants of the invention provide excellent antioxidant, anti-wear, and bearing corrosion inhibition with substantial absence of phosphorous. Colclough 579 at 7:22-24.

2. Colclough 580

Colclough 580 discloses lubricant compositions, especially automobile crankcase lubricants, containing low or zero amounts of phosphorous. Colclough 580 at 2:3-4.

The disclosed lubricant compositions contain small amounts of phosphorus, i.e., less than 0.01 weight percent, preferably less than 0.005

weight percent, but more preferably the lubricating compositions are substantially free of phosphorus. Colclough 580 at 4:35-36.

Colclough 580 provides examples of the invention as well as comparative examples. Colclough 580 at 6:57-7:23.

Colclough 580 explains that the results reported in these examples show that the lubricants of the invention have excellent antioxidant, anti-wear, and bearing corrosion inhibition with substantial absence of phosphorus. Colclough 580 at 7:24-26.

### 3. Waddoups

The invention disclosed in Waddoups encompasses methods for improving the fuel economy properties of an internal combustion engine, the method comprising the steps of adding the disclosed lubricating oil composition to an engine and operating the engine. Waddoups at 1:52-56.

The lubricating oil composition contains phosphorus from a zinc dihydrocarbyldithiophosphate (ZDDP) compound. Waddoups at 1:31-49.

The ZDDP compound is said to provide antioxidant and anti-wear properties to the lubricating oil composition. Waddoups at 8:51-54.

Waddoups discloses that the lubricating oil composition must have a low phosphorus content, i.e., the phosphorus from the ZDDP compound should be present in an amount up to about 0.1 weight percent. Waddoups at 9:6-9.

Preferably, the phosphorus content should be from about 0.025 weight percent to about 0.1 weight percent. Waddoups at 9:9-11.

The compositions can be used in the formulation of crankcase lubricating oils, i.e., passenger car motor oils, heavy duty diesel motor oils,

and passenger car diesel oils, for spark-ignited and compression-ignited engines. Waddoups at 9:20-23.

4. Lesieur

Lesieur discloses a system for desulfurizing a gasoline supply. Lesieur at 1:8-11.

The desulfurizing system reduces sulfur contaminants found in fuel to levels that reduce internal combustion engine corrosion. Lesieur at 1:11-15.

The disclosed system can lower the amount of sulfur in a fuel stream to less than about 0.05 parts per million, a level which will not significantly damage the components of an internal combustion engine. Lesieur at 3:45-51.

5. Welstand

Welstand discloses an unleaded gasoline fuel that is substantially free of oxygenates and has a sulfur content of less than 30 ppmw, more preferably less than 20 ppmw, even more preferably less than 15 ppmw, and most preferably about 10 ppmw or less. Welstand at 7:66-8:5.

Example 2 describes a fuel having a sulfur content of 5 ppmw. Table 3, Fuel I.

The disclosed gasoline fuel is said to offer substantially oxygenate free gasoline which avoids the environmental impact of oxygenates, yet when combusted in an internal combustion automobile engine provides good performance and good emissions. Welstand at 3:11-15.

Generally, the lower the sulfur content, the more magnified the beneficial effects observed. Welstand at 9:21-22.

According to Welstand, the disclosed gasoline fuel compositions are applicable to all gasoline fueled cars. Welstand at 8:37-39.

D. PRINCIPLES OF LAW

A claimed invention is not patentable if the subject matter of the invention would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007); *Graham v. John Deere Co.*, 383 U.S. 1 (1966).

Facts relevant to a determination of obviousness include (1) the scope and content of the prior art, (2) any differences between the claimed invention and the prior art, (3) the level of skill in the art, and (4) any relevant objective evidence of obviousness or non-obviousness. *KSR*, 127 S. Ct. at 1734, 82 USPQ2d at 1388, *Graham*, 383 U.S. at 17-18.

The question under 35 U.S.C. § 103 is not merely what the references teach but what they would have suggested to one of ordinary skill in the art at the time the invention was made. *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976).

One of ordinary skill in the art is presumed to have skills apart from what the prior art references expressly disclose. *See In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985). A person of ordinary skill is also a person of ordinary creativity, not an automaton. *KSR*, 127 S. Ct. at 1742, 82 USPQ2d at 1397.

The combination of familiar elements according to known methods is likely obvious when the combination does no more than yield predictable results. *KSR*, 127 S. Ct. at 1739, 82 USPQ2d at 1395.

All that is required for obviousness under 35 U.S.C. § 103 is a reasonable expectation of success. *O'Farrell*, 853 F.2d 894, 904, 7 USPQ2d 1673, 1681 (Fed. Cir. 1988).

A rejection premised upon a proper combination of references cannot be overcome by attacking the references individually. *In re Keller*, 642 F.2d 413, 426, 208 USPQ 871, 882 (CCPA 1981).

E. ANALYSIS

1. Rejection of claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Waddoups in combination with Lesieur or Welstand

The Examiner makes the following findings with respect to the teachings of Waddoups (Answer at 4):

Waddoups et al [“Waddoups”] disclose a lubricating oil composition and methods for improving the fuel economy properties of an internal combustion engine which comprises the steps of adding the lubricating oil composition to an engine and operating the engine. See column 1, lines 52-58. Waddoups teaches that the composition has a low phosphorus content. The phosphorus from a zinc dialkyldithiophosphate compound is present in the lubricating oil composition in an amount of up to 0.1 weight %, preferably 0.025 to about 0.1 weight %. Waddoups teaches that the compositions may be used in the formulation of crankcase lubricating oils for spark-ignited and compression-ignited engines. See column 9, lines 5-28.

The Examiner finds that Waddoups does not disclose that the lubricating oil composition is used in conjunction with a gasoline fuel having a sulfur content of less than 10 ppm by weight. However, the Examiner finds that any well-known gasoline fuel may be used in the spark-ignited internal combustion engine disclosed in Waddoups. Relying on Lesieur and Welstand, the Examiner finds that low sulfur containing gasoline fuels are well-known in the art. Answer at 4.

The Appellants argue that Waddoups does not teach, suggest, or imply that the disclosed lubricating oil composition is useful for reducing engine wear. Appeal Brief at 6. The Appellants also argue that the lubricating oil composition disclosed in Waddoups was never evaluated in an actual internal combustion engine. Appeal Brief at 7.

We find that Waddoups expressly discloses that the lubricating oil composition contains phosphorus from a ZDDP compound, and the ZDDP compound provides antioxidant and anti-wear properties to the lubricating oil composition. Waddoups 1:31-49 and 8:51-54; see also Appellants' Specification 3:5-6 (disclosing that anti-wear agent is a ZDDP compound). To the extent that the lubricating oil composition may not have been actually tested in an internal combustion, this disclosure in Waddoups is no less probative. *Cf. Gould v. Quigg*, 822 F.2d 1074, 1078, 3 USPQ2d 1302, 1304 (Fed. Cir. 1987) (an applicant need not have actually reduced the invention to practice prior to filing).

The Appellants further argue that Waddoups discloses that the phosphorus content of the disclosed lubricating oil composition is up to 0.1 weight percent, preferably from 0.025 to 0.1 weight percent. The Appellants argue that Waddoups does not attach any significance to a lubricating oil composition having a phosphorus content of less than 0.5 weight percent. Appeal Brief at 7.

We find that the phosphorus range disclosed in Waddoups (0.025 to 0.1 weight percent) overlaps the claimed phosphorus range (no more than 0.5 weight percent). It is well-settled that where the difference between the claimed invention and the prior art is an overlapping range, the Appellants must show that the particular range is critical by evidence of unexpected

results. *In re Wertheim*, 541 F.2d 257, 267 191 USPQ 90, 100 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

The Appellants argue that wear, as evidenced by iron content in the oil, is high when a high phosphorus lubricating oil is used in conjunction with either a high or low sulfur fuel. However, the Appellants argue that wear is “unexpectedly” reduced when a low phosphorus lubricating oil is used in conjunction with a low sulfur fuel. Appeal Brief at 7-8.

Specifically, referring to Tables 9-11 of the Appellants’ Specification, the Appellants argue that when combusting a high sulfur fuel (700 ppmw) and lubricating with a high phosphorus lubricating oil (0.093 weight percent), the end of test analysis indicates an iron content of 40 mg/kg. When combusting a low sulfur fuel (9 ppmw) and lubricating with a high phosphorus lubricating oil (0.093 weight percent), the end of test analysis indicates an iron content of 17 mg/kg. In contrast, when combusting a low sulfur fuel (9 ppmw) and lubricating with a low phosphorus lubricating oil (0.046 weight percent), the end of test analysis indicates an iron content of 6 mg/kg. The Appellants argue that this result is “unexpected.” Appeal Brief at 10.

The Appellants have failed to establish that the reduced wear said to be achieved by the Appellants’ claimed method is “unexpected.” First, the data contained in the Appellants’ Specification is incomplete. The Appellants’ Specification does not report any experimental data for a test that uses a high sulfur fuel and a low phosphorus lubricating oil. See Appellants’ Specification 3:22-24.

Second, although a lower iron content was observed using a low sulfur fuel and a low phosphorus lubricating oil, the Appellants have failed to establish that this lower iron content was significant and unexpected, especially in view of the fact that low phosphorus lubricating oils having antioxidant and anti-wear properties were known in the art. *See In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973) (a showing of “unexpected results” must establish that the difference actually obtained would not have been expected by one skilled in the art); *In re D’Ancicco*, 439 F.2d 1244, 1248, 169 USPQ 303, 306 (CCPA 1971) (appellants failed to rebut prima facie case of obviousness where asserted differences between claimed foams and prior art foams were not shown to be significant).

Based on the record before us, it is reasonable to conclude that Waddoups in combination with Lesieur or Welstand render obvious the method of claim 11.

Claims 13-29 stand with claim 11.

2. Rejection of claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Colclough 579 or Colclough 580 in combination with Lesieur or Welstand

The Examiner finds that Colclough 579 and Colclough 580 disclose crankcase lubricating oil compositions suitable for use in automobile engines containing less than 0.05 weight percent phosphorus, preferably less than 0.01 weight percent phosphorus. The Examiner finds that Colclough 579 and Colclough 580 do not disclose that the lubricating oil compositions are used in conjunction with a gasoline fuel having a sulfur content less than 10 ppm by weight. However, the Examiner finds that any well-known gasoline fuel may be used in the automobile engine disclosed in Colclough 579 and

Colclough 580. Relying on Lesieur and Welstand, the Examiner finds that low sulfur containing gasoline fuels are well-known in the art. Answer at 5-6.

The Appellants argue that one of ordinary skill in the art would not have expected that wear in an internal combustion engine running on low sulfur content fuel could be reduced by lubricating the engine using a lubricating oil composition having a phosphorus content less than 0.05 weight percent. Appeal Brief at 12.

We disagree. Colclough 579 discloses automobile crankcase lubricant oil compositions having a phosphorus content less than 0.05 weight percent that provide excellent antioxidant, anti-wear, and bearing corrosion inhibition. Likewise, Colclough 580 discloses automobile crankcase lubricant oil compositions having a phosphorus content less than 0.01 weight percent that provide excellent antioxidant, anti-wear, and bearing corrosion inhibition. We find that one of ordinary skill in the art would have reasonably expected the lubricant compositions disclosed in Colclough 579 and Colclough 580 to reduce engine wear in any automobile engine, including an automobile engine running on the low sulfur content fuel disclosed in Lesieur and Welstand.

The Appellants also argue that the claimed invention produces unexpected results. Appeal Brief at 13. However, as discussed above, the Appellants have failed to establish that the results reported in the Appellants' Specification are "unexpected."

Based on the record before us, it is reasonable to conclude that Colclough 579 or Colclough 580 in combination with Lesieur or Welstand render obvious the method of claim 11.

Claims 13-29 stand with claim 11.

F. CONCLUSIONS OF LAW

The Appellants have not sustained their burden of showing that the Examiner erred in rejecting claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Waddoups in combination with Lesieur or Welstand.

The Appellants have not sustained their burden of showing that the Examiner erred in rejecting claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Colclough 579 or Colclough 580 in combination with Lesieur or Welstand.

G. DECISION

The rejection of claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Waddoups in combination with Lesieur or Welstand is AFFIRMED.

The rejection of claims 11 and 13-29 under 35 U.S.C. § 103(a) as being unpatentable over Colclough 579 or Colclough 580 in combination with Lesieur or Welstand is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

Appeal 2007-1483  
Application 10/344,390

cc (via U.S. Mail):

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