

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CHEVRON ORONITE COMPANY LLC,  
Petitioner,

v.

INFINEUM USAL.P.,  
Patent Owner.

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Case IPR2018-00923  
Patent 6,723,685 B2

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Before JON B. TORNQUIST, MICHELLEN. ANKENBRAND, and  
JULIA HEANEY, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

DECISION  
Denying Institution of *Inter Partes* Review  
35 U.S.C. § 314(a)

## I. INTRODUCTION

Chevron Oronite Company LLC (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–20 of U.S. Patent No. 6,723,685 B2 (Ex. 1001, “the ’685 patent”). Infineum USA L.P. (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 6, “Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314. For the reasons discussed below, we deny the Petition and do not institute an *inter partes* review.

### A. *Related Proceedings*

The parties identify *Infineum USA LP v. Chevron Oronite Company LLC*, Case No. 1-18-cv-00323 (D. Del) as a related matter. Pet. 2; Paper 4, 1. The parties also note that the ’685 patent is at issue in IPR2018-00922 and IPR2018-00924. Paper 4, 1; Pet. 2.

### B. *The ’685 Patent*

The ’685 patent is directed to lubricating oil compositions that “exhibit simultaneously improved low temperature valve train wear performance, excellent compatibility with fluoroelastomer materials commonly used for seals in modern internal combustion engines, and improved fuel economy properties.” Ex. 1001, 1:4–9.

The ’685 patent explains that lubricating oil compositions for combustion engines typically contain a base oil of lubricating viscosity, as well as various additives used “to improve detergency, to reduce engine wear, to provide stability against heat and oxidation, to reduce oil consumption, to inhibit corrosion, to act as a dispersant, and to reduce friction loss.” *Id.* at 1:12–19. The ’685 patent further explains that “[s]ome

additives provide multiple benefits, such as dispersant-viscosity modifiers,” whereas other additives improve one characteristic of the lubricating oil while adversely affecting one or more other characteristics. *Id.* at 1:19–22. Thus, according to the ’685 patent, “to provide lubricating oil having optimal overall performance, it is necessary to characterize and understand all the effects” of available additives and “carefully balance the additive content of the lubricant.” *Id.* at 1:23–26.

The ’685 patent discloses that when “small amounts of one or more oil soluble molybdenum compounds,” an ashless, organic, nitrogen-free friction modifier, zinc dihydrocarbyl dithiophosphate (ZDDP), and a calcium detergent are added to a base oil having a viscosity of at least 95 and a Noack volatility<sup>1</sup> of less than 15%, a low-cost lubricating composition with improved fuel economy, excellent wear protection, and reduced adverse effects on fluoroelastomer seals is provided. *Id.* at 2:1–8, 2:47–55.

### *C. Illustrative Claim*

Petitioner challenges claims 1–20 of the ’685 patent. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A lubricating oil composition comprising:
  - a) an oil of lubricating viscosity having a viscosity index of at least 95;
  - b) at least one calcium detergent;
  - c) at least one oil soluble molybdenum compound;

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<sup>1</sup> Noack volatility measures the evaporative loss of lubricant oil at high temperature. Ex. 1001, 2:53–55; Ex. 1002 ¶ 23. A lower Noack volatility is associated with a less volatile oil. Ex. 1002 ¶ 23.

d) at least one organic ashless nitrogen-free friction modifier;  
and

e) at least one metal dihydrocarbyl dithiophosphate compound, wherein said composition is substantially free of ashless aminic friction modifiers, has a Noack volatility of about 15 wt. % or less, from about 0.05 to 0.6 wt. % calcium from the calcium detergent, molybdenum in an amount of from about 10 ppm to about 350 ppm from the molybdenum compound, and phosphorus from the metal dihydrocarbyl dithiophosphate compound in an amount up to about 0.1 wt. %.

Ex. 1001, 13:47–63.

#### *D. The Asserted Ground of Unpatentability*

Petitioner contends claims 1–20 of the '685 patent would have been obvious over the combined disclosures of Waddoups,<sup>2</sup> Walker,<sup>3</sup> and Hertz.<sup>4</sup> Pet. 3–4, 19–59. In support of its obviousness arguments, Petitioner relies upon the declaration testimony of Donald J. Smolenski, Ph.D. (Ex. 1002).

## II. ANALYSIS

### *A. Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are construed according to their broadest reasonable interpretation in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2016); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard).

Claim 1 requires that the lubricating composition comprise “at least one calcium detergent” and contain “from about 0.05 to 0.6 wt. % calcium

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<sup>2</sup> US 6,074,993, issued June 13, 2000 (Ex. 1005).

<sup>3</sup> WO 99/60080, published November 25, 1999 (Ex. 1007).

<sup>4</sup> Daniel L. Hertz, Jr., *Elastomers in Automotive Fuels, Oils & Fluids at High Temperatures*, SAE Technical Paper Series 930993, 1–4 (1993) (Ex. 1008).

from the calcium detergent.” Ex. 1001, 13:50, 13:57–58. Petitioner does not expressly construe these claim terms, but its arguments assume that when more than one calcium detergent is used in the lubricating composition, it is only necessary to show that one calcium detergent provides the composition with “from about 0.05 to 0.6 wt. % calcium.” Pet. 27–28. We disagree.

The term “at least one calcium detergent” in claim 1 encompasses the use of multiple calcium detergents. The subsequent use of the term “the” in the phrase “from about 0.05 to 0.6 wt. % calcium from the calcium detergent” does not change this plural meaning. *See Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) (“The subsequent use of definite articles ‘the’ or ‘said’ in a claim to refer back to the same claim term does not change the general plural rule, but simply reinvokes the non-singular meaning.”). Thus, on its face, claim 1 requires that the calcium from all the calcium detergents be considered when determining the level of calcium imparted by “the calcium detergent.” The specification of the ’685 patent is consistent with this understanding, disclosing that “[i]n the present invention, one or more calcium-based detergents are used in an amount introducing from about 0.05 to about 0.6 wt. % calcium into the composition.” Ex. 1001, 7:66–8:1.

In view of the foregoing, we construe claim 1 of the ’685 patent to require that the calcium provided by all the calcium detergents be “from about 0.05 to 0.6 wt. %.”

*B. Asserted Obviousness in view of Waddoups, Walker, and Hertz*

Petitioner contends the subject matter of claims 1–20 would have been obvious over the combined disclosures of Waddoups, Walker, and Hertz. Pet. 19–59.

*1. Waddoups*

Waddoups discloses lubricating oil compositions that “exhibit improvements in fuel economy properties and excellent wet clutch friction performance when used as a universal oil.” Ex. 1005, 1:5–9. According to Waddoups, fuel economy properties can be improved by “using two different types of molybdenum additives in combination with an organic friction modifier, a calcium or magnesium overbased detergent and a zinc dihydrocarbyl dithiophosphate.” *Id.* at 1:24–28. The base oil in this composition “preferably should have a viscosity index of at least 95, preferably at least 100,” and the organic friction modifiers are preferably “amides of polyamines.” *Id.* at 2:35–37, 8:33–34.

Waddoups discloses eight oils that were evaluated for coefficient of friction properties. *Id.* at 12:25–26, Table 1. The contents of these eight oils are shown in Table 1, which is reproduced below:

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Component, Wt. %								
(a) Dispersant, Silicone Antifoam, Diluent Oil	4.940	4.940	4.940	4.940	4.940	4.940	4.940	4.940
(b) Overbased Mg Sulfonate	0.000	0.000	0.000	0.000	1.180	1.180	1.180	1.180
(c) Overbased Ca Sulfonate	1.500	1.500	1.500	1.500	0.000	0.000	0.000	0.000
(d) Neutral Ca Phenate and Sulfonate	0.800	0.800	0.800	0.800	0.800	0.800	0.800	0.800
(e) Amine Antioxidant	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
(f) PIBSA	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
(g) Mo Trimer	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
(h) Mo Dimer	0.000	0.000	1.600	1.600	0.000	0.000	1.600	1.600
(i) ZDDP	1.160	1.160	1.160	1.160	1.160	1.160	1.160	1.160
(j) Polyol Ester (FM)	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.000
(k) Alkoxyate Amine (FM)	0.200	0.000	0.200	0.000	0.200	0.000	0.200	0.000
Total (a)-(k)	9.75	9.35	11.35	10.95	9.43	9.03	11.03	10.630
(l) Base Oil	80.40	80.80	78.80	79.20	80.72	81.12	79.12	79.52
(m) Lube Oil Flow Improver	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
(n) Viscosity Modifier	9.55	9.55	9.55	9.55	9.55	9.55	9.55	9.55
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Mo Trimer, ppm of molybdenum	100 ppm							
Mo Dimer, ppm of molybdenum	0 ppm	0 ppm	800 ppm	800 ppm	0 ppm	0 ppm	800 ppm	800 ppm
Total FM (j + k)	0.4	0	0.4	0	0.4	0	0.4	0
NOACK Volatility	11.9%	12.0%	12.6%	13.2%	12.1%	12.1%	12.9%	13.3%

Notes for Table 1

- (a) The dispersant is a 54% active mineral oil solution of borated polyisobutenyl succinimide dispersant.
- (b) The overbased Mg sulfonate had a TBN of 400; a 57% by weight solution in mineral oil was used.
- (c) The overbased Ca sulfonate had a TBN of 300; a 55% by weight solution in mineral oil was used.
- (f) "PIBSA" refers to polyisobutenyl succinic anhydride; a 72% by weight solution in mineral oil was used.
- (g) "Mo trimer" is  $Mo_3S_7((alkyl)_2dtc)_4$  when alkyl is a cocoalkyl chain being a mixture of  $C_8-C_{18}$  alkyls of even numbered carbons, mainly  $C_{10}$ ,  $C_{12}$  and  $C_{14}$  alkyls from coconut oil and "dtc" represents dithiocarbamate.
- (h) "Mo dimer" is "Molyvan 822", an oil soluble molybdenum dialkyl dithiocarbamate available from Vanderbilt Chemical (the exact length of the alkyl groups is proprietary to the manufacturer).
- (i) "ZDDP" is a 50%/50% wt. mixture of zinc dialkyldithiophosphate with 85 wt. % secondary alkyl groups and 15 wt. % primary alkyl groups, and zinc dialkyldithiophosphate with 100% primary alkyl groups.
- (j) and (k) are friction modifiers (FM).
- (m) "LOFI" is a lube oil flow improver, a 48% solution of a dialkylfumarate-vinyl acetate copolymer.
- (n) "OCP" is an olefin copolymer viscosity modifier commercially available as "Paratone 8011".

As shown in Table 1, Oils 1 and 3 of Waddoups both contain 1.5 wt. % overbased calcium sulfonate and 0.8 wt. % neutral calcium phenate and sulfonate. *Id.*

## 2. Walker

Walker discloses lubricating compositions containing "a lubricating base stock, a dispersant, a metal dihydrocarbyl dithiophosphate, and either a copper-containing compound or a molybdenum-containing compound."

Ex. 1007, 2:12–15.<sup>5</sup> Walker reports that these compositions contain "at

<sup>5</sup> We refer to the original page numbers of Walker, not the page numbers Petitioner added.

most 0.1 % by weight of phosphorous” and preferably at most 0.05 wt. % phosphorous. *Id.* at 2:15–16, 2:26–29.

When a molybdenum compound is present, Walker reports that it is used at a level of 50 to 350 ppm, and especially about 250 ppm. *Id.* at 10:31–11:2. Examples of molybdenum compounds that may be used in Walker include “molybdenum salts of inorganic and organic acids” and molybdenum compounds that “comprise a trinuclear molybdenum core.” *Id.* at 11:7–8, 12:1–3.

### 3. *Hertz*

Hertz discusses the use of elastomers in automobiles and various degradation mechanisms that may impair these products. Ex. 1008, 1.<sup>6</sup> With respect to engine lubricants, Hertz reports that “[t]he prime source of attack on elastomers are the various antioxidants added, typically a primary-secondary combination of zinc dithiopropionate (ZnDTP) and nonylated diphenylamine (base).” *Id.* at 2. According to Hertz, the amine component of these compounds can not only crosslink a standard acrylonitrile-butadiene elastomer but also dehydrofluorinate any vinylidene fluoride containing fluoropolymer. *Id.*

### 4. *Analysis*

As noted above, claim 1 requires that the total calcium imparted by the “at least one calcium detergent” is “from about 0.05 to 0.6 wt. %.” Ex. 1001, 13:50, 13:57–58. Petitioner asserts that Waddoups discloses this limitation “in at least two ways.” Pet. 27.

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<sup>6</sup> We refer to the original page numbers of Hertz, not the page numbers Petitioner added.

First, Petitioner asserts Waddoups discloses that “the amount of overbased calcium or magnesium detergents used can vary broadly, but typically will be from about 0.5 to about 5 wt. %, based on the total weight of the composition.” *Id.* (quoting Ex. 1005, 4:41–44). Second, Petitioner calculates that the 1.5 wt. % overbased calcium sulfonate detergent in Oils 1 and 3 of Waddoups would provide the lubricating composition with 0.18 wt. % calcium, which falls within the claimed range of 0.05 to 0.6 wt. %. *Id.* at 27–28 (citing Ex. 1005, Table 1; Ex. 1002 ¶¶ 71–72).

We are not persuaded by these arguments. First, Petitioner does not adequately explain why Waddoups’ disclosure of using about 0.5 to about 5 wt. % of overbased calcium or magnesium detergents would have motivated one of ordinary skill in the art to maintain the *total calcium* imparted by *all the detergents* in the composition within the range of “about 0.05 to 0.6 wt. %,” as recited in claim 1. Second, Petitioner’s calculations with respect to Oils 1 and 3 of Waddoups fail to consider the neutral calcium phenate and sulfonate detergents in these compositions. *Id.*; *see* Ex. 1005, 9:61–65, 10:5–9 (identifying neutral calcium phenates and sulfonates as detergents). Given these deficiencies, Petitioner has not demonstrated sufficiently that the calcium imparted by the calcium detergents in Oils 1 and 3 of Waddoups is “from about 0.05 to 0.6 wt. %,” or that one of ordinary skill in the art would have been motivated to maintain the total calcium imparted by all the calcium detergents in the lubricants within this range. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (“In an IPR, the petitioner has the burden from the outset to show with particularity why the patent it challenges is unpatentable.”) (citing 35 U.S.C.

§ 312 (a)(3)). Thus, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to independent claim 1 of the '685 patent.

Claims 2 and 5–17 are composition claims that depend directly or indirectly from claim 1. Ex. 1001, 13:64–67, 14:6–51. Claims 18–20 are method claims that require the use of the lubricating oil of claim 1 in an internal combustion engine. *Id.* at 14:52–65. Petitioner's arguments and evidence with respect to these claims do not cure the deficiencies noted above with respect to claim 1. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to claims 2 and 5–20.

Claim 3 depends from claim 1 and further requires that “said calcium detergent is an overbased calcium sulfonate.” *Id.* at 14:1–2. Claim 4 depends from claim 3 and further requires that “said overbased calcium sulfonate has a total base number of between about 150 to 450.” *Id.* at 14:3–5. On this record, dependent claims 3 and 4 can reasonably be read to limit the “at least one calcium detergent” of claim 1 to “an overbased calcium sulfonate” (claim 3) having “a total base number between about 150 to 450” (claim 4). As discussed above, Petitioner adequately demonstrates that Oils 1 and 3 of Waddoups contain 0.18 wt. % calcium from the 300 TBN overbased calcium sulfonate detergent. Pet. 27–28 (citing Ex. 1005, Table 1; Ex. 1002 ¶¶ 71–72).

Even when a petitioner demonstrates a reasonable likelihood of prevailing with respect to one or more claims, however, institution of review remains discretionary. *SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1356 (2018); *Harmonic*, 815 F.3d at 1367 (“First of all, the PTO is permitted, but never compelled, to institute an IPR proceeding.”). Office guidance issued June 5, 2018, explains that the Board may consider the number of claims and

grounds that meet the reasonable likelihood standard when deciding whether to institute *inter partes* review under 35 U.S.C. § 314(a). *SAS Q&As*, part D, Effect of *SAS* on future challenges that could be denied for statutory reasons (June 5, 2018).<sup>7</sup> Here, Petitioner demonstrates, at most, a reasonable likelihood of prevailing with respect to two dependent claims out of a total of twenty challenged claims. On this record, instituting a trial with respect to all twenty claims based on evidence and arguments directed to dependent claims 3 and 4 is not an efficient use of the Board's time and resources. Thus, we do not institute an *inter partes* review.

### III. ORDER

It is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, the Petition is denied and no *inter partes* review is instituted.

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<sup>7</sup> Available at:  
[https://www.uspto.gov/sites/default/files/documents/sas\\_qas\\_20180605.pdf](https://www.uspto.gov/sites/default/files/documents/sas_qas_20180605.pdf).

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