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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/667,466	11/07/2007	Grant Berent Jacobsen	LCM-4702-66	9644
23117	7590	03/07/2013	EXAMINER	
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			LEE, RIP A	
			ART UNIT	PAPER NUMBER
			1762	
			NOTIFICATION DATE	DELIVERY MODE
			03/07/2013	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* GRANT BERENT JACOBSEN, DUSAN JEREMIC,  
SERGIO MASTROIANNI, and IAN DOUGLAS MCKAY

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Appeal 2011-013494  
Application 11/667,466  
Technology Center 1700

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Before TERRY J. OWENS, HUBERT C. LORIN, and  
MARK NAGUMO, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

### STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 26-36. Claims 37 and 39-50, which are all of the other pending claims, stand withdrawn from consideration by the Examiner. We have jurisdiction under 35 U.S.C. § 6(b).

#### *The Invention*

The Appellants claim a supported catalyst system for olefin polymerization. Claim 26 is illustrative:

26. A supported catalyst system for the polymerisation of olefins, said catalyst system comprising:

(a) at least two different monocyclopentadienyl transition metal compounds,

(b) one or more activators comprising an ionic compound comprising (i) a cation and (ii) an anion having up to 100 non-hydrogen atoms and the anion containing at least one substituent comprising a moiety having an active hydrogen, and

(c) one or more support materials.

#### *The References*

Jacobsen	US 5,783,512	Jul. 21, 1998
Lue	US 6,207,606 B1	Mar. 27, 2001
McKay	US 6,235,672 B1	May 22, 2001

#### *The Rejections*

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 26-33 and 36 over McKay in view of Jacobsen and claims 34 and 35 over McKay in view of Jacobsen and Lue.

### OPINION

We affirm the rejections.

*Rejection of claims 26-33 and 36*

The Appellants argue claims 26-33 and 36 as a group (Br. 9-14). We therefore limit our discussion to one claim in that group, i.e., claim 26, which is the sole independent claim. Claims 27-33 and 36 stand or fall with that claim. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2007).

McKay discloses a catalyst system for (co)polymerizing ethylene to broad molecular weight distribution polyethylene, comprising at least two different mono- or di-phosphinimine catalysts, at least one cocatalyst and a particulate support (col. 1, ll. 42-49). Each catalyst most preferably contains one phosphinimine ligand, one cyclopentadienyl ligand and two chloride or alkyl ligands (col. 2, ll. 13-16). The disclosed cocatalysts are alumoxanes and ionic activators (col. 3, l. 30 – col. 5, l. 10).

Jacobsen discloses a solid catalyst for addition polymerization of monomers which preferably are alpha-olefins and most preferably include ethylene or propylene (col. 19, l. 42 – col. 20, l. 9). The catalyst can comprise (a) an ionic compound comprising (a1) a cation and (a2) an anion having up to 100 non-hydrogen atoms and containing at least one substituent comprising an active hydrogen moiety,<sup>1</sup> (b) a transition metal compound, (c) an organometal compound wherein the metal is selected from groups 1-14 of the periodic table, and (d) a support material (col. 3, ll. 26-34). The preferred ionic compounds (a) include di(octadecyl)methylammonium tris(pentafluorophenyl)(hydroxyphenyl) borate (col. 8, ll. 60-63; col. 21, l. 65) which is one of the Appellants'

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<sup>1</sup> Jacobsen states that a substituent comprising an active hydrogen moiety is “a substituent comprising a hydrogen atom bonded to an oxygen, sulphur, nitrogen or phosphorous atom” (col. 5, ll. 16-20).

particularly preferred activators (Spec. 9:28-32). The preferred transition metal compounds (b) include monocyclopentadienyl transition metal compounds (col. 12, l. 57 – col. 13, l. 20). The organometal compound (c) can be an alumoxane (col. 13, ll. 63-63).

The Appellants argue that “Jacobsen describes the use of a specific activator for use with a range of transition metal compounds” (Br. 14) and “aims to provide catalyst systems which can improve undesirable particle characteristics such as low bulk densities (see col. 1, lines 34 – 40)” (Br. 13),<sup>2</sup> and that “there is no disclosure or suggestion in Jacobsen of the use of the activators with more than one transition metal compound, let alone more than one monocyclopentadienyl compound”, *see id.*, “whereas McKay discloses the use of catalyst systems comprising at least two different compounds containing phosphinimine ligands with either aluminoxanes or traditional borate activators” (Br. 14) and “aims to improve the processability of homogeneous polyethylenes (see col. 1, lines 23 – 39)” (Br. 13). “Based on this,” the Appellants argue, “there would have been no motivation for one of ordinary skill in the art, as of the filing date of the prese[n]t application, to combine Jacobsen and McKay” (Br. 14).

Establishing a prima facie case of obviousness requires showing that one of ordinary skill in the art would have had both an apparent reason or motivation to modify the prior art and predictability or a reasonable expectation of success in doing so. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991).

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<sup>2</sup> Jacobsen discloses that the polymer particles’ low bulk density is due fouling of the reactor by polymer resulting from the use of soluble catalyst (col. 1, ll. 27-38).

McKay discloses that “the catalytic material should be very well anchored to the support so as to reduce the incidence of fouling resulting from the deposition of catalyst or cocatalyst which has dissociated from the support” (col. 5, ll. 17-20). Jacobsen discloses that catalyst comprising the ionic compound (a) dispersed in a solvent in which it is insoluble or sparingly soluble, in association with the transition metal compound (b) and the organometal compound (c), can be used in a particle-forming polymerization process without an additional support material to produce polymer of the desired particle size and morphology in the form of free flowing powder or particles without causing substantial polymer deposits at reactor walls and moving parts in the reactor, and that the catalyst, when supported on the support material (d), can have a particle size which varies over a wider range (col. 4, ll. 15-41).

One of ordinary skill in the art would have been motivated to use Jacobsen’s catalyst’s ionic compound (a) as McKay’s catalyst’s ionic activator because the low reactor fouling provided by Jacobsen’s combination of ionic compound (a), transition metal compound (b) and organometal compound (c) (col. 4, ll. 15-41) is desired by McKay (col. 5, ll. 17-20). One of ordinary skill in the art would have had a reasonable expectation of success in doing so because, 1) like McKay’s ionic activator, Jacobsen’s ionic compound’s anion (a1) can be a boron-containing activator (which differs from McKay’s boron-containing activator by comprising a moiety (e.g., -OH) having an active hydrogen) (McKay, col. 3, l. 65 – col. 5, l. 10; Jacobsen (col. 7, ll. 13-45)), 2) the effect provided by Jacobsen’s catalysts’ cation (a2) appears to be desirable in McKay’s catalyst in view of McKay’s disclosure “that ‘ionic activators’ initially cause the abstraction of

one or more of the activatable ligands in a manner which ionizes the catalyst into a cation, then provides a bulky, labile, non-coordinating anion which stabilizes the catalyst in cationic form” (col. 3, ll. 58-61), 3) like McKay’s mono- or di-phosphinimine catalyst, Jacobsen’s catalyst (which differs from McKay’s catalyst by not comprising a phosphinimine ligand) can comprise a cyclopentadienyl-transition metal complex (Jacobsen’s transition metal compound (b)) (McKay, col. 1, l. 66 – col. 2, l. 7; Jacobsen, col. 12, l. 57 – col. 13, l.20), 4) Jacobsen’s organometal compound (c) can be an alumoxane which McKay’s catalyst can contain (Jacobsen, col. 13, ll. 62-63; McKay, col. 3, ll. 30-43), 5) McKay and Jacobsen do not indicate that Jacobsen’s ionic compound (a) has any characteristic which renders it unsuitable for use with McKay’s phosphinimine ligand-containing catalyst and 6) Jacobsen provides no indication that the ionic compound is useful with only a single cyclopentadienyl transition metal compound.

Thus, the use of Jacobsen’s ionic compound as McKay’s ionic activator would have been prima facie obvious to one of ordinary skill in the art.

The Appellants rely upon evidence of unexpected results (Br. 10). For the following reasons the totality of the evidence, including the Appellants’ evidence of unexpected results, does not support a conclusion of nonobviousness of the Appellants’ claimed catalyst system.

First, the Appellants’ evidence of unexpected results does not provide a side-by-side comparison of the claimed invention with the closest prior art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). The Appellants compare their Examples 2 and 3 to McKay’s Examples 9 and 10 (the Appellants’

Comparative Examples 5 and 6) (Br. 12). Although the transition metal complexes in McKay's Examples 9 and 10 fall within the scope of the Appellants' monocyclopentadienyl transition metal compounds, the Appellants do not keep the monocyclopentadienyl transition metal compound constant in their comparison and vary only the activator (the Appellants' ionic compound versus McKay's alumoxane) but, rather, also vary the monocyclopentadienyl transition metal compound and the polymerization conditions (Spec. 15:1-16:21; McKay col. 9, ll. 58-66; Tables 1, 2). Thus, the cause-and-effect relationship which the Appellants desire to show between the use of their activator and activity (Spec. 18:5-12) is lost in multiple unfixed variables. *See In re Heyna*, 360 F.2d 222, 228 (CCPA 1966); *In re Dunn*, 349 F.2d 433, 439 (CCPA 1965).

Second, it is not enough for the Appellants to show that the results for the Appellants' invention and the comparative examples differ. The difference must be shown to be an unexpected difference. *See In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). The Appellants argue that regardless of the multiple unfixed variables in their evidence of unexpected results, one of ordinary skill in the art would not have expected such a large activity increase resulting from the use of their activator because the effects of the variables other than the activator are secondary to the effect of the activator (Br. 10-13). The Appellants do not support that argument with evidence. The mere argument of counsel relied upon by the Appellants cannot take the place of evidence. *See De Blauwe*, 736 F.2d at 705; *In re Payne*, 606 F.2d 303, 315 (CCPA 1979); *In re Greenfield*, 571 F.2d 1185, 1189 (CCPA 1978); *In re Pearson*, 494 F.2d 1399, 1405 (CCPA 1974). The Appellants argue that the

molecular weight distributions of 8.27 and 4.08 in, respectively, their Examples 9 and 10 (Spec. 20: Table 2) are unexpectedly higher than the molecular weight distributions of 2.68 and 2.17 in, respectively, McKay's Examples 9 and 10 (Table 3). That argument is not convincing in view of the molecular weight distribution of 9.28 in McKay's Example 5.

Moreover, the Appellants have not provided evidence that the relied-upon molecular weight distribution differences would have been unexpected by one of ordinary skill in the art.

Third, the evidence is not commensurate in scope with the claims. *See In re Grasselli*, 713 F.2d 731, 743 (Fed. Cir. 1983); *In re Clemens*, 622 F.2d 1029, 1035 (CCPA 1980). The Appellants' claims encompass a wide range of monocyclopentadienyl transition metal compounds and activators, but in the examples relied upon by the Appellants only one monocyclopentadienyl transition metal compound and one activator are used (Spec. 15:1 – 16:21). We find in the evidence of record no reasonable basis for concluding that the great number of materials encompassed by the Appellants' claims would behave as a class in the same manner as the particular materials tested. *See In re Lindner*, 457 F.2d 506, 508 (CCPA 1972); *In re Susi*, 440 F.2d 442, 445-46 (CCPA 1971).

For the above reasons we are not persuaded of reversible error in the rejection of claims 26-33 and 36.

#### *Claims 34 and 35*

The Appellants argue that Lue's metallocene-type compounds differ in structure from those of McKay or Jacobsen and that, therefore, one of ordinary skill in the art would not have combined those references (Br. 15).

The Examiner relies upon Lue (col. 13, ll. 48-56) for a suggestion to support McKay's at least two different mono- or di-phosphinimine catalysts on separate supports (Ans. 6). The Appellants have not established that the alleged difference between McKay's and Lue's metallocene-type compounds would have caused one of ordinary skill in the art to consider separate supports to be unsuitable for McKay's at least two different mono- or di-phosphinimine catalysts. Accordingly, we are not convinced of reversible error in the rejection of claims 34 and 35.

DECISION/ORDER

The rejections under 35 U.S.C. § 103 of claims 26-33 and 36 over McKay in view of Jacobsen and claims 34 and 35 over McKay in view of Jacobsen and Lue are affirmed.

It is ordered that the Examiner's decision 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

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