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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LUBIN LUO
and STEVEN P. DIEFENBACH

Appeal 2011-009810
Application 12/442,345
Technology Center 1700

Before BRADLEY R. GARRIS, MICHAEL P. COLAIANNI, and
GEORGE C. BEST, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner finally rejected claims 1-13, 15-19, 21, and 33 of Application 12/442,345 under 35 U.S.C. § 102(b) as anticipated, under 35 U.S.C. § 103(a) as obvious, and/or on the basis of obviousness-type double patenting. Appellants seek reversal of these rejections pursuant to 35 U.S.C. § 134(a). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we REVERSE.

BACKGROUND

The '345 application describes partially hydrolyzed aluminum alkyl compounds called aluminoxanes that are alleged to be useful for activating transition metals for use as olefin polymerization catalysts (Spec. ¶ [0001]). The aluminoxanes described in the '345 application are alleged to be stable to deactivation pathways and exhibit high sustainable activity for commercial olefin polymerizations (*id.* at ¶¶ [0004]-[0005]).

Claims 1 and 33 are the only independent claims in the '345 application and are reproduced below, with the language that is the focus of our analysis emphasized:

1. A composition comprising:
 - a) a Bronsted acidic cation $[Q_mH]^+$ wherein H is a proton, m is 1 or 2, each Q is Lewis base, and each Lewis base Q can be the same as, or different from, any other Lewis base Q; and
 - b) an aluminate anion chemically bonded to at least one type of carrier, *wherein each of a majority of aluminum atoms in the aluminate anion is chemically bonded to at least two oxygen atoms on the surface of the carrier forming chelating aluminum centers.*

33. A composition comprising:
 - a) a carrier having at least two hydroxyl groups;
 - b) an organoaluminum compound comprising $AlR_n(XR^1)_{(3-n)}$ wherein Al is aluminum;

each R is hydrogen or a hydrocarbyl group having up to about 20 carbon atoms, and each R may be the same as, or different from, any other R;

for each XR^1 , X is a hetero atom and R^1 is an organic group bonded to the Al through the hetero atom and having up to about 20 carbon atoms;

each XR^1 may be the same as, or different from, any other XR^1 ; and n is 1, 2, or 3.

- c) a Lewis base; and
- d) a Bronsted acid,

wherein the ratio of (mmol OH on the carrier)/(g carrier) to (mmol organoaluminum compound)/(g carrier) is from about 1.80:1 to about 2.20.

App. Br. Claims App'x (emphasis added).

REJECTIONS

1. The Examiner provisionally rejected claims 1-13, 15-19, 21, and 33 on the ground of non-statutory obviousness-type double patenting as unpatentable over claims 1-9 and 14-16 of copending Application 12/442,334¹ in view of U.S. Patent No. 7,034,173 B2 ("Schottek," issued April 25, 2006) (Final Office Action ("FOA") 3-6 (Sept. 1, 2010)).
2. The Examiner finally rejected claims 1-12, 15-19, 21, and 33 under 35 U.S.C. § 102(b) as anticipated by WO 01/90112 A1 (published Nov. 29, 1001)² (FOA 6-10).
3. The Examiner finally rejected claim 13 under 35 U.S.C. § 103(a) as obvious over WO 01/90112 A1 (FOA 10-11).

¹ Published as U.S. Patent Application Publication No. 2010/0010181 A1 on January 14, 2010.

² The parties cite Schottek as the English-language equivalent of WO 01/90112 A1.

DISCUSSION

We address each of the rejections *seriatim* below.

Rejection 1. Application 12/442,334 was abandoned on September 9, 2010.³ Therefore, the provisional obviousness-type double patenting rejection is vacated as moot.

Rejection 2. The Examiner finally rejected 1-12, 15-19, 21, and 33 as anticipated by Schottek.

If “each and every limitation is found either expressly or inherently in a single prior art reference,” then the claim is invalid under § 102 for anticipation. *Sanofi–Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1375 (Fed. Cir. 2006) (internal quotation marks omitted). Here, Appellants argue that the rejection should be reversed because Schottek does not describe, either literally or inherently, at least one limitation in each of the independent claims of the ’345 application (App. Br. 14). In particular, Appellants argue that Schottek does not describe a material in which (1) the “majority of aluminum atoms in the aluminate anion is chemically bonded to at least two oxygen atoms on the surface of the carrier forming chelating aluminum centers,” as required by claim 1 and (2) “the ratio of (mmol OH on the carrier)/(g carrier) to (mmol organoaluminum compound)/(g carrier) is from about 1.80:1 to about 2.20[:1],” as required by claim 33 (*id.*).

In making an anticipation rejection, elements found to be inherently present must necessarily be present in or result from the prior art. *In re Montgomery*, 677 F.3d 1375, 1379-80 (Fed. Cir. 2012). “Inherency . . . may

³ Surprisingly, even though both Appellants and the Examiner filed multiple papers in this application after Sept. 9, 2010 (including the Appeal Brief and the Examiner’s Answer), neither appears to have noticed that the ’334 application had been abandoned.

not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Olerich*, 666 F.2d 578, 581 (CCPA 1981) (quoting *Hansgirg v. Kemmer*, 102 F.2d 212, 214 (CCPA 1939)).

Appellants argue that following Schottek’s broadly disclosed procedure would not inevitably result in the claimed complex of two surface bound oxygen atoms with each aluminum atom (App. Br. 10-13). In particular, Appellants point to two portions of Schottek’s process description that are not sufficiently detailed to inevitably give rise to the materials claimed in the ’345 application.

First, Appellants point to Schottek’s description of the method used to prepare the inorganic support material for reaction with an organoaluminum compound as being too broad (App. Br. 11-13). Schottek states that the inorganic support material, e.g. silica, should be dried before use unless it naturally has a low moisture content (Schottek col. 30 ll. 62-64). If drying is necessary, the support material should be dried at a temperature between 100 and 1000°C., preferably between 200 and 800°C. (Schottek col. 30 l. 64-col. 31 l. 4). The precise temperature used is expressly described as being not critical (*id.*).

In contrast, Appellants’ Specification explains that the drying temperatures used are important because it is necessary to ensure that the inorganic support material continues to have a large number of adjacent surface hydroxyl groups that are able to chelate the aluminum atom in the organoaluminum compound (Spec. ¶ [0024]). Therefore, the ’345 application states that it is important to limit the temperatures used in drying the support material. The Specification states that the drying temperature used should not exceed 400°C. (Spec. ¶ [0009]). The Specification further

describes the use of inorganic supports that have been dried at 600°C. as not leading to active catalyst compositions (Spec. ¶¶ [0050]-[0053]).

Second, Appellant argues that Schottek does not describe the conditions used in the reaction of the organoaluminum compound in adequate detail (App. Br. 9-10). Schottek describes in general terms the reaction of “an inorganic support material (C) is reacted with a metal compound of the formula (V)” (Schottek col. 33, ll. 17-31). Trimethyl aluminum is an example of a metal compound of formula (V) (Schottek col. 29, ll. 26-46) and reacts with surface hydroxyl groups on the solid support. Schottek expressly states that the reaction can be performed under a wide range of conditions: “The amount of metal compounds of the formula (V) can vary within wide limits; the minimum amount depends on the number of hydroxyl groups on the support. Temperature, reaction times and pressures are not critical per se; preference is given to the temperatures and reaction times described [below]” (Schottek col. 33 ll. 21-27). “The conditions for the reactions in steps 1 to 3 are not critical; temperatures within the range from 20 to 150°C. and reaction times in the range from 0.1 to 20 hours have been found to be particularly suitable” (Schottek col. 37 ll. 4-7).

In contrast, the '345 application explains that it is important to use about 0.5 equivalents of organoaluminum compound for each equivalent of surface bound hydroxyl and sets forth reaction conditions to be used when contacting the organoaluminum compound with the inorganic support material (Spec. ¶¶ [0024]-[0025]). Furthermore, the specification includes examples of material prepared in processes which used about 0.6 or about 0.85 equivalents of organoaluminum compound per equivalent of surface hydroxyl (Spec. ¶ [0048]; Table 2.1 (entries 2.1-6 and 2.1-7)). Catalysts prepared using this solid support material were much less active than those

prepared with the proper ratio of organoaluminum compound to surface hydroxyl (Spec. ¶ [0049]; Table 2.2).

In sum, Appellants have presented ample evidence that Schottek's broad disclosure would not inevitably result in the creation of a composition that meets the limitations set forth in claims 1 and 33 of the '345 application. Therefore, we reverse the Examiner's rejection of claims 1-12, 15-19, 21, and 33 as anticipated.

Rejection 3. Appellants' arguments against the rejection of claim 13 as obvious over Schottek rely upon the arguments made in support of the patentability of claim 1 (App. Br. 15). As discussed above, we have reversed the rejection of claim 1 as anticipated by Schottek. Thus, we also reverse the rejection of claim 13 as obvious because Schottek does not establish a prima facie case of obviousness.

CONCLUSION

We have vacated the provisional obviousness-type double patenting rejection of claims 1-13, 15-19, 21, and 33 as moot because the '334 application—which is the basis for the rejection—has been abandoned. We also have reversed the anticipation rejection of claims 1-12, 15-19, 21, and 33 and the obviousness rejection of claim 13 of the '345 application.

REVERSED

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