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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GARO GARBIS VAPORCIYAN

Appeal 2011-011947
Application 12/175,497
Technology Center 1700

Before RICHARD E. SCHAFER, RICHARD TORCZON, and CHRISTOPHER L. CRUMBLEY, *Administrative Patent Judges*.

CRUMBLEY, *Administrative Patent Judge*.

DECISION ON APPEAL

Garo Garbis Vaporciyan ("Appellant") seeks relief under 35 U.S.C. § 134(a) from the Examiner's final rejection of Claims 1-3 and 5.[1] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

The appealed claims are directed to a method for storing and/or transporting bisphenolacetone (BPA) and subsequently producing aromatic polycarbonate. Claim 1, set forth below, is illustrative of the subject matter on appeal:

> 1. A method for producing aromatic polycarbonate, comprising:
>
> (1) transporting a liquid mixture of acetone and bisphenolacetone to a polycarbonate production plant;
>
> (2) separating the bisphenolacetone from the acetone;
>
> (3) reacting the bisphenolacetone with diphenylcarbonate to produce polycarbonate.

Appellant has argued the patentability of Claims 1-3 together, and argued that Claim 5 is patentable for the same reasons as Claim 1. Claims 2, 3, and 5 therefore stand or fall together with Claim 1. 37 C.F.R. § 41.37(c)(1)(vii); *Hyatt v. Dudas*, 551 F.3d 1307, 1311-14 (Fed. Cir. 2008).

The Examiner relies upon the following evidence of unpatentability:

Miyamoto	US 6,750,314 B2	Jun. 15, 2004
Vaporciyan	US 2005/0090638 A1	Apr. 28, 2005

[1] Application Ser. No. 12/175,497, entitled *Method For Storage and/or Transport of Bisphenolacetone and Method For Producing Aromatic Polycarbonate*, filed July 18, 2008, claiming priority to EP 07112681.7 filed July 18, 2007. The real party in interest is listed as Shell Oil Company.

The Rejected Claims

Claims 1-3 and 5 stand rejected under 35 U.S.C. §103(a) as obvious over Miyamoto in view of Vaporciyan.

The Issue Presented

The issue before us on appeal is whether the prior art in combination teaches or suggests "transporting a liquid mixture of acetone and bisphenolacetone."

ANALYSIS

Aromatic polycarbonate, also referred to simply as polycarbonate, is a clear, hard polymer useful in a wide range of applications. Polycarbonate is most commonly produced by reacting bisphenolacetone (BPA) with diphenylcarbonate, however the use of BPA does have several drawbacks. For instance, BPA is preferably stored and transported in its molten state, but the temperature required (greater than 160ºC) is difficult to maintain during transportation and may lead to the degradation of the BPA and discoloration of the resulting polycarbonate. Spec. 2, ll. 5-17. [2]

Appellant proposes to address this problem by using acetone as a solvent to lower the melting point of BPA during storage and transportation. When dissolved in acetone, BPA can be transported at temperatures ranging from 15 to 90ºC, reducing the risk of degradation of the BPA. *Id.* 8, ll. 7-15. Additionally, as acetone is used as one of the components in the production of BPA, Appellant notes the use of a raw material as a solvent gives the

[2] We refer to the instant Vaporciyan specification as "Spec."

added advantage of enabling further production of BPA at the site where polycarbonate is being produced. *Id.* 8 ll. 15-33.

The Examiner rejected the appealed claims as obvious over a combination of two prior art references, each of which disclose a method for transporting raw components of a polycarbonate production process and then subsequently producing polycarbonate. We address each reference separately below.

Miyamoto discloses a process for producing polycarbonate from BPA and a carbonate material such as diphenylcarbonate. Miyamoto col. 2, ll. 32-45. BPA is first produced by reacting phenol with acetone, resulting in a BPA/phenol composition. *Id.* The BPA/phenol solution is then held in a molten state until the BPA can be reacted with a carbonate to produce polycarbonate. *Id.* Miyamoto notes that the solution of BPA in phenol is advantageous because the phenol lowers the melting point of BPA to about 120ºC. *Id.* ll. 19-26.

Miyamoto therefore discloses the process of the Claim 1, with the sole difference being that Miyamoto uses one of the reagents used to produce BPA (phenol) as the solvent whereas the present process uses the other reagent used to produce BPA (acetone) as the solvent. As Appellant notes, using acetone is advantageous over Miyamoto's phenol because it allows the melting point of BPA to be lowered significantly. Spec. 13 ll. 6-13.

Vaporciyan[3] also discloses a method of producing polycarbonate. Rather than transporting BPA in acetone as in the instant claims, Vaporciyan discloses dissolving the diphenylcarbonate in acetone, transporting the

[3] The prior art reference cited by the Examiner shares the same inventor as the present application. For clarity, we will use "Vaporciyan" to refer to the reference, and "Appellant" to refer to the instant application.

mixture to a production step, separating the acetone from the diphenylcarbonate, and then producing polycarbonate by reacting BPA with the diphenylcarbonate. Vaporciyan ¶¶ 0015-0021. Vaporciyan notes that dissolving diphenylcarbonate in acetone allows the diphenylcarbonate to be stored and transported in molten form, but at a much lower temperature (15-70ºC) than diphenylcarbonate alone. *Id.* ¶ 0024.

The Vaporciyan reference therefore discloses the process of the Claim 1, with the sole difference being that Vaporciyan uses acetone to dissolve and lower the melting temperature of one of the ingredients of polycarbonate (diphenylcarbonate) while Appellant claims using acetone to dissolve and lower the melting temperature of the other ingredient of polycarbonate (BPA).

In making an obviousness rejection over the combination of Miyamoto and Vaporciyan, the Examiner reasoned that it would have been obvious to use the solvent of Vaporciyan (acetone) in place of the solvent of Miyamoto (phenol). Ans. 4.[4] As the Examiner noted, Vaporciyan teaches that acetone is known to lower the melt viscosity and glass transition temperature of BPA. *Id.* Since this is the same purpose for which Miyamoto uses phenol, according to the Examiner it would have been obvious to substitute acetone for the phenol of Miyamoto. *Id.*

Appellant responded to the rejection by claiming that the Examiner took the disclosure of Vaporciyan out of context. According to Appellant, Vaporciyan discloses that a small amount of acetone present when BPA is reacted with diphenylcarbonate lowers melt temperature of the

[4] We refer to the Appeal Brief filed March 2, 2011 ("App. Br.") and the Examiner's Answer mailed April 22, 2011 ("Ans.").

diphenylcarbonate. App. Br. 3. "At these low levels of acetone," Appellant argues, "it cannot really be considered a solvent." *Id.* Appellant argues that Vaporciyan is distinguishable from the present invention, wherein acetone is used as a solvent prior to the BPA/diphenylcarbonate reaction. *Id.*

Based on our review of the reference, the teaching of Vaporciyan cannot be distinguished on these grounds. First, the reference does not limit the effect of the acetone on melting point to only the diphenylcarbonate, as Appellant seems to imply. Vaporciyan broadly states that acetone reduces "the melt viscosity and the glass transition temperature of diphenyl carbonate, *bisphenolacetone*, and the formed polycarbonate." Vaporciyan ¶ 0051 (emphasis added).

Second, we are not convinced by Appellant's argument that the small amount of acetone present in the BPA/diphenylcarbonate reaction means that "it cannot really be considered a solvent." App. Br. 3. The Vaporciyan reference – which has the *same inventor* as the present application – expressly refers to the acetone as a "solvent and/or plasticizer." Vaporciyan ¶ 0051. Appellant cannot distance himself from his own words so easily.

Finally, as the Examiner points out, the Vaporciyan reference was cited as teaching a particular property of acetone: namely, its ability to lower the melting point of BPA. "This property would be universal and a person having ordinary skill in the art at the time of invention would have a reasonable expectation that acetone will lower melt processing temperature of bisphenolacetone. This is the effect desired in Miyamoto et al." Ans. 6.

CONCLUSION

For the foregoing reasons, we find that the prior art in combination teaches or suggests all elements of the appealed claims. We therefore affirm the rejection of Claims 1-3 and 5 as obvious under 35 U.S.C. § 103(a).

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

kmm