United States District Court,
D. Delaware.

SOLVAY, S.A,
Plaintiff.
v.
HONEYWELL SPECIALTY MATERIALS LLC and Honeywell International Inc,
Defendants.

Civ. No. 06-557-SLR

Dec. 9, 2008.

Richard L. Horwitz, Potter Anderson & Corroon, LLP, Wilmington, DE, for Plaintiff.

MEMORANDUM ORDER

SUE L. ROBINSON, **District Judge.**

At Wilmington this 9th day of December, 2008, having heard oral argument on, and having reviewed the papers submitted in connection with, the parties' proposed claim construction;

IT IS ORDERED that the disputed claim language of the patent in suit, U.S. Patent No. 6,730,817 ("the '817 patent"), as identified by the above referenced parties, shall be construed consistent with the tenets of claim construction set forth by the United States Court of Appeals for the Federal Circuit in Phillips v. AWH Corp., 415 F.3d 1303 (Fed.Cir.2005), as follows:

1. "In a process for the preparation of 1,1,1,3,3-pentafluoropropane comprising reaction of 1,1,1,3,3-pentachloropropane with hydrogen fluoride in the presence of a hydrofluorination catalyst." The parties agree that chemical shorthand should be used, to wit: "A process for preparing HFC-245fa from the reaction of HCC-240fa with HF in the presence of a hydrofluorination catalyst."

Because of the Jepson format of independent claims 1 and 12, the above quoted preamble represents the prior art. Indeed, U.S. Patent No. 5,574,192 ("the ' 192 patent"), disclosed to the PTO during prosecution of the '817 patent, claims a process for the manufacture of HFC-245fa which comprises reacting HCC-240fa with HF in the presence of a fluorination catalyst "under conditions sufficient to produce" HFC-245fa. (D.I. 138, ex. 4, '192 patent, col. 6, ln. 60-col. 7, ln. 2) (emphasis added) The claims of the '192 patent teach different organic starting materials and different fluorination catalysts, as well as different conditions (temperatures, time of reaction, ratios of reactive compounds), with the end result being the recovery of HFC-245fa. ('192 patent, col. 7, ln. 3-col. 8, ln. 48) As noted in the specification of the '192 patent, "HFC-245fa may be recovered from the mixture of unreacted starting materials, by-products, and catalyst by any means known in the art, such as distillation and extraction." ('192 patent, col. 3, ll. 55-57) More specifically, "unreacted HF and organics may be vented and condensed, and the HF layer recycled to the reactor. The organic layer can then be treated, i.e., washed with an aqueous base, to remove dissolved HF[,] and distilled. This isolation procedure is particularly useful for a continuous fluorination process." ('192 patent, col 3, ln. 63-col. 4, ln.1)

During prosecution, the patentee distinguished the invention of the '817 patent from that of the '192 patent as follows:

The instant claim [1] requires the reaction at a temperature and under a pressure at which [HFC-245fa] is gaseous and isolating said [HFC-245fa] from the reaction mixture by drawing off [HFC-245fa] and [HCI] in a gaseous phase as each of said [HFC-245fa] and [HCI] is being formed. Example 3 of VANDERPUY '192 describes a hydrofluorination process of [HCC-240fa] in [the] presence of a catalyst wherein [HCI] is periodically vented.

VANDERPUY '192 does not provide motivation:

(a) to select carrying out the reaction at a temperature and under a pressure at which [HFC-245fa] is gaseous,

(b) to draw off in vapour phase [HFC-245fa] and [HCI] as each of said [HFC-245fa] and [HCI] is being formed.

In fact, ... the process of the invention enables [HFC-245fa] to be easily separated from the reaction mixture, which is an advantage as it makes it possible to retain or to return to the reactor the unconverted reactants and chlorofluoropropanes possibly formed by incomplete fluorination of [HFC-245fa].

This advantage is even more apparent in the second independent claim which is limited to a process wherein the reaction is carried out in a reactor equipped with a device for drawing off a gas stream which is controlled

(a) to draw of[f] a gas stream of [HFC-245fa] and [HCI] as each of said [HFC-245fa] and [HCI] is being formed, thereby isolating said [HFC-245fa] from the reaction mixture.

(b) to keep in the reactor in the liquid state the unconverted [HCC-240fa], most of the [HF] and most of the products of partial fluorination of [HCC-240fa].

Feature (b) is not suggested in VANDERPUY '192....

In sum, the inventive process provides specific instructions how to advantageously operate a process for the preparation of [HFC-245fa] comprising reaction of of [HCC-240fa] with [HF] by using embodiments which are neither taught nor suggested in VANDERPUY '192.

(D.I. 138, ex. 5 at 11-12) (emphasis in original)

2. "The improvement which comprises carrying out the reaction at a temperature and under a pressure at which 1,1,1,3,3-pentafluoropropane is gaseous and isolating [said] 1,1,1,3,3-pentafluoropropane from the reaction mixture by drawing off 1,1,1,3,3-pentafluoropropane and hydrogen chloride in a gaseous phase as each of said 1,1,1,3,3-pentafluoropropane and hydrogen chloride is being formed." The process for making

HFC-245fa includes a reaction at a temperature and under a pressure whereby HFC-245fa and HCI are produced in gaseous form and separated from the reaction mixture in a gas stream that can include other compounds, such as unconverted reactants and chlorofluoropropanes possibly formed by incomplete fluorination of HCC-240fa. ('817 patent, col. 2, ll. 44-48, 64-66; D.I. 138, ex. 5 at 12) FN1

FN1. "The work is preferably carried out at a temperature and pressure at which, furthermore, the [HFC-245fa] produced is at least partially in gaseous form, which enables it to be easily isolated from the reaction mixture." (emphasis added)

a. Defendants argue that the reaction disclosed in claim 1 must be at a temperature and under a pressure such that "pure" HFC-245fa would exist as a gas because, in the prosecution history, the patentee distinguished a prior art compound, 1,1,1,3,3,3-hexafluoropropane (found in "Van der Puy '997"), from HFC-245fa on the basis of the compounds' respective atmospheric boiling points (-1 (deg.) C versus +14 (deg.) C,FN2 respectively) vis a vis the temperature and pressure limitations contained in the independent claims. (D.I. 108 at 2; D.I. 138, ex. 5 at 9-11) I find this argument less than compelling. In the first instance, the above distinction was made in terms of the structural difference in the compounds, not in terms of limiting the process to "pure" HFC-245fa. FN3 Moreover, while defendants' proposed claim construction might describe a process for maintaining HFC-245fa in a gaseous form, the claim describes a process for producing HFC-245fa in a gaseous form so that it can be separated from the reaction mixture.

FN2. According to defendants, the atmospheric boiling point of "pure" HFC-245fa.

FN3. HFC-245fa
is structurally different from compounds fluorinated in Van der Puy.... For said compounds, totally different behavior in fluorination reaction is observed. Consequently, the behavior of [HFC-245fa] in fluorination reaction was unpredictable over Van der Puy '997; hence Van der Puy '997 provides no reasonable expectation of producing the process of the rejected claims.

Id. at 10 (emphasis added).
b. Defendants also argue that the word "isolate" as used in claim 1 means that "only" the HFC-245fa and HCI are drawn off from the reaction mixture in a gas stream as they are being formed. Although I acknowledge that the dictionary definition of "isolate" implicates separation of a "pure chemical substance," nevertheless, the patentee uses the phrases "separate," "isolate," and "to draw off" interchangeably in the specification and the prosecution history. ('817 patent, col. 2, ll. 44-48, ll. 64-66; D.I. 138, ex. 5 at 11-12) Moreover, the patentee uses the word "isolate" in claim 12 in conjunction with language clearly contemplating that the gas stream drawn off the reaction mixture includes more than HFC-245fa and HCI; to wit, only "most" of the HF and "most" of the products of partial fluorination of HFC-245fa must be kept in the reactor in the liquid state. ('817 patent, col. 6, ll. 26-30) Defendants, in their proposed claim construction, concede that the word "isolate" in claim 12 allows for the gas stream to "possibly" include "residual amounts of other non-reacting compounds," as well as the HFC-245fa and HCI. (D.I. 108 at 11) I conclude that the "isolating" limitation found in claims 1 and 12 should be construed consistently. The fact that claim 12 discloses a device to accomplish the process, while claim 1 only describes the process, does not convince me that the patentee meant to use the same word ("isolate") to describe different processes.

c. Finally, defendants argue that plaintiff disclaimed such a broad construction of the word "isolate" by distinguishing the '192 patent during prosecution. As I read the prosecution history, plaintiff argued that the ' 192 patent disclosed only general parameters for the manufacture of HFC-245fa (i.e., disclosing a variety of compounds under a variety of conditions). Moreover, the "recovery by distillation" process generally disclosed in the ' 192 patent does not specifically mention the venting of HFC-245fa, the end product; instead, the examples of the '192 patent mention only the removal by venting, distillation or evaporation of by-products.FN4 In contrast, the ' 817 patent specifically discloses the recovery by distillation of HFC-245fa. With respect to the composition of the gas stream, clearly the patentee contemplated that it may include "unconverted reactants and chlorofluoropropanes possibly formed by incomplete fluorination of [HCC-240fa]," and even described the above phenomenon as an advantage for returning the nonreactants to the reactor. (D.I. 138, ex. 5 at 12) I conclude, therefore, that a broad construction of the limitation is consistent with the record provided.

FN4. In examples 1 and 2, the "volatile materials" were removed by distillation or evaporation; in examples 3 and 5, the only mention of distillation is the "periodic venting" of HCI by-product. ('192 patent, col. 5, ln. 35 to col. 6, ln. 54)

3. "The process of claim 1 [and of claim 12], which comprises conducting the reaction continuously in a liquid phase and maintaining a molar ratio of the catalyst to 1,1,1,3,3-pentachloropropane maintained from 0.001 to 1000." The process is carried out by continuously feeding HCC-240fa and HF into the reaction mixture, which mixture is kept in liquid form. The quantity of hydrofluorination catalyst used is expressed in relation to the stationary quantity of HCC-240fa present in the reaction mixture, and must be maintained at a molar ratio of from 0.001 to 1000. ('817 patent, col. 2, ll, 49-55)

4. "The process of claim 2 [and of claim 13], wherein the molar ratio of the catalyst to 1,1,1,3,3-pentachloropropane is greater than 0.5." The quantity of hydrofluorination catalyst used is expressed in relation to the stationary quantity of HCC-240fa present in the reaction mixture, and must be maintained at a molar ratio greater than 0.5. (Id.)

5. "The process of claim 3 [and of claim 12] wherein from 5 to 100 moles of hydrogen fluoride are used per mole of 1,1,1,3,3-pentachloropropane." 5 to 100 moles of HF are added FN5 to the reaction mixture for each mole of HCC-245fa added to the reaction mixture. (' 817 patent, col. 2, ll. 28-33)

FN5. Defendants argue that the word "used" should be construed to mean "consumed." I decline to add this limitation to the claim, as the word "consume" relates, in my mind, to how efficient the reaction is. There is nothing in the specification or the prosecution history that requires the reaction process to be efficient to any certain degree.

6. "The improvement which comprises carrying out the reaction in a reactor equipped with a device for drawing off a gas stream at a temperature and under a pressure at which 1,1,1,3,3-pentafluoropropane is gaseous." The process for making HFC-245fa takes place in a reactor equipped with a device for drawing off a gas stream at a temperature and under a pressure whereby HFC-245fa is produced in gaseous form. ('817 patent, col. 2, ll. 44-48, 64-66)

7. "And wherein said device is controlled (a) to draw off a gas stream comprising 1,1,1,3,3-

pentafluoropropane and hydrogen chloride as each of said 1,1,1,3,3-pentafluoropropane and hydrogen chloride is being formed thereby isolating said 1,1,1,3,3-pentafluoropropane from the reaction mixture." As the HFC-245fa and HCI are produced in gaseous form, they are separated from the reaction mixture in a gas stream by the device. ('817 patent, col. 2, ll. 44-48, 64-66)

8. "(b) to keep in the reactor in the liquid state the unconverted 1,1,1,3,3-pentachloropropane, most of the hydrogen fluoride and most of the products of partial fluorination of 1,1,1,3,3-pentachloropropane." The gas stream can include residual amounts of other compounds, such as unconverted reactants and chlorofluoropropanes possibly formed by incomplete fluorination of HCC-240fa. However, the unconverted HCC-240fa, more than 50% of the HF, and more than 50% of the partially fluorinated intermediates must remain in the reactor vessel in the liquid state. ('817 patent, col. 2, In. 64-col. 3, ln. 2; col. 3, ll. 10-14)

The prosecution history describes claim 12 as being "limited" to a process whereby the reaction is carried out in a reactor "equipped with a device for drawing off a gas stream which is controlled ... to keep in the reactor in the liquid state the unconverted HCC-240fa, most of the HF and most of the products of partial fluorination of HCC-240fa." (D.I. 138, ex. 5 at 12) Therefore, claim 12 is a more limited, narrow claim than claim 1 and should be construed accordingly.

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