THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 45

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAILED

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PAT. & T.M. OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JOHN A. WISMER

Appeal No. 93-4311
Application 07/879,068[1]

HEARD: April 6, 1995

Before GOLDSTEIN, KIMLIN and WEIFFENBACH, Administrative Patent Judges.

WEIFFENBACH, Administrative Patent Judge.

DECISION ON APPEAL

This appeal is from the examiner's final rejection of claims 1-6, which are all the claims remaining in the application.

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[1] Application for patent filed May 1, 1992. According to applicant, the application is a continuation of Application 07/561,212, filed July 30, 1990, which is a continuation of Application 07/365,345, filed June 13, 1989.

The invention is directed to a continuous non-catalytic fluorination process for making mixtures of 1,1-dichloro-1-fluoroethane (CH_3CFCl_2) and 1-chloro-1,1-difluoroethane (CH_3CF_2Cl) by reacting 1,1,1-trichloroethane (CH_3CCl_3) with hydrofluoric acid (HF).

Claim 1 is illustrative of the claimed invention:

1. A continuous non-catalytic process for the manufacture of a mixture of 1,1-dichloro-1-fluoroethane and 1-chloro-1,1-difluoroethane from 1,1,1-trichloroethane comprising:

(a) continuously feeding hydrogen fluoride and 1,1,1-trichloroethane in a selected molar feed ratio to a reaction zone to form a liquid phase hydrofluorination reaction mixture in said reaction zone;

(b) continuously withdrawing from the reaction zone, vapor phase reaction product comprising 1,1-dichloro-1-fluoroethane and 1-chloro-1,1-difluoroethane;

(c) continuously refluxing hydrogen fluoride from the vapor phase reaction product to the reaction mixture; and

(d) obtaining a mixture of 1,1-dichloro-1-fluoroethane and 1-chloro-1,1-difluoroethane from the vapor phase reaction product;

wherein said selected hydrogen fluoride/1,1,1-trichloroethane molar feed ratio

(i) is within the range of from about 3.0 to about 5.2; and

(ii) is greater than the value M determined by the equation

$$M = 2.7X + 4.2Y$$

wherein

X is the desired mole fraction of 1-chloro-1,1-difluoroethane in the resulting 1,1-dichloro-1-fluoroethane/1-chloro-1,1-difluoroethane mixture; and

Y is the desired mole fraction of 1,1-dichloro-1-fluoroethane in the resulting 1,1-dichloro-1-fluoroethane/1-chloro-1,1-difluoroethane mixture.

As evidence of unobviousness, the examiner relies on the following:

Ukaji et al. (Ukaji) 3,833,676 Sep. 3, 1974

"Pennwalt Process" (admitted prior art) disclosed in an Information Disclosure Statement (Paper No. 2) filed August 24, 1989 in Application 07/365,345 and in paragraphs 9 and 10 of a "Declaration of John A. Wismer Under 37 CFR 1.132" (Paper No. 4) filed January 18, 1990 in Application 07/365,345.

Claims 1-6 stand rejected under 35 U.S.C. § 103 as being unpatentable over the "Pennwalt Process" and Ukaji.

Appellant states in his brief[2] that the claims do not stand or fall together. Although appellant has presented arguments which satisfy the requirements of 37 CFR §§ 1.192(c)(5) and (c)(6)(iv) with regard to claims 2, 3, 5 and 6, as to claim 4, no arguments have been presented explaining how the specific limitations in claim 4 render the claimed subject matter unobvious over the prior art relied upon by the examiner. Accordingly, claim 4 will stand or fall with independent claim 1.

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[2] Page 5 of the appeal brief.

The Rejection

The examiner rejected all of the claims under 35 U.S.C. § 103 as being unpatentable over the "Pennwalt Process" in combination with Ukaji. Appellant's admitted knowledge of the "Pennwalt Process" may be used in determining patentability of his claimed subject matter. *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986); *In re Davis*, 305 F.2d 501, 134 USPQ 256 (CCPA 1962).

Appellant admits that the apparatus essentially described in the drawing figure of this application was employed in the "Pennwalt Process" for producing CH_3CF_2Cl, as the single reaction product, from HF and CH_3CCl_3. The apparatus comprises a system which includes a reactor vessel[3], a means for separately supplying HF and CH_3CCl_3 into the reaction vessel, a distillation column, and a refluxing means (condenser). According to appellant, the "Pennwalt Process" process is a continuous non-catalytic process wherein HF and CH_3CCl_3 are continuously fed in a HF:CH_3CCl_3 molar feed ratio from 2.7 to 2.95 into the reaction vessel to form a liquid phase reaction mixture, a vapor phase which includes HF and CH_3CF_2Cl from the reaction in the reaction

[3] Appellant states that the reactor vessel "may have the typical construction known to those skilled in the art for the continuous hydrofluorination of halocarbons." See page 5, lines 10-12 of appellant's specification.

vessel is drawn off, and any HF in the vapor phase is continuously refluxed back into the liquid phase reaction mixture. Because of the refluxing step in the process, liquid phase reaction mixture is enriched in HF. Thus, the reaction mixture always contains a higher concentration of HF than the vapor product of the reaction or the HF:CH_3CCl_3 fed into the reaction vessel.

Appellant describes the selection of the molar feed ratio in the "Pennwalt Process" as being dictated by the need to replace HF in the liquid phase reaction mixture by the reaction with "halocarbon"[4] or loss with the reaction products drawn off in the vapor phase. Appellant states in Paragraph 10 of the "Declaration of John A. Wismer Under 37 CFR 1.132" that

> This molar feed ratio, combined with a reflux ratio of at least 1.5 lb. reflux per lb of gas taken overhead [i.e. above the reaction vessel], has resulted in the exclusive production of [CH_3CF_2Cl]. The phenomenon of chlorofluorocarbon phase separation[5] is not generally a problem with the Pennwalt process

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[4] The term "halocarbon" was used, but not defined, by appellant in paragraph 9 of his affidavit (Declaration of John A. Wismer Under 37 CFR 1.132, Paper No. 4 in Application 07/365,345). In the absence of a definition, "halocarbon" is interpreted to include compounds such as CH_3CCl_3, CH_3CFCl_2, or CH_3CF_2Cl.

[5] Although the term "phase separation" has been used by appellant in his brief and in his specification, it has not been defined by appellant. However, as the term is used in the context of the specification, we believe that appellant is referring to a situation where CH_3CCl_3 forms a separate liquid phase from a liquid phase containing HF. See appellant's specification: page 2, lines 2-10; page 3, line 31 to page 4, line 6; and page 4, lines 14-19.

> since, to the best of my knowledge, the reactants are generally miscible in all proportions.

In his rejection of the claims, the examiner regarded the "Pennwalt Process" as differing from the claimed process in only two respects. First, the "Pennwalt Process" produced only CH_3CF_2Cl as the sole reaction product whereas the claimed process produces a mixture of CH_3CFCl_2 and CH_3CF_2Cl. Second, the molar feed ratio of the "Pennwalt Process" ranged from 2.75 to 2.95 while the molar ratio in the claimed process ranges from 3.0 to 5.2 and must be greater than the minimum molar feed ratio, M, as defined by the equation in claim 1, *supra*.

The examiner relied on Ukaji to show that a molar feed ratio within the range of 3.0 and 5.2 will produce a mixture of CH_3CFCl_2 and CH_3CF_2Cl. Ukaji is directed to a non-catalytic batch process, as opposed to a continuous process, for the fluorination of CH_3CCl_3 by HF to form a mixture of CH_3CFCl_2 and CH_3CF_2Cl. In particular, the process involves reacting one mole of CH_3CCl_3 with at least one mole of HF in a liquid phase in a closed stainless steel reactor to produce a mixture of CH_3CFCl_2 and CH_3CF_2Cl with a trace amounts of CH_3CF_3. See the graphical illustrations in Figures 1 and 2 and see also Examples 1 and 2 of Ukaji. The examiner pointed to Example 1 of Ukaji in which 24 mole percent of CH_3CFCl_2 and 70 mole percent of CH_3CF_2Cl are produced after two

hours from an initial reactant mixture of 4.3 moles of HF and 1 mole of CH_3CCl_3. From the data in Example 1, the examiner computed the minimum molar feed ratio, M, for the reaction after two hours to be 3.1.[6] This ratio is less than the HF:CH_3CCl_3 molar ratio of the reaction (4.3) as required by claim 1.

In view of these teachings, the examiner concluded that the it would have been obvious to one of ordinary skill in the art to use the molar ratio taught by Ukaji in the "Pennwalt Process" and expect to yield a mixture of both CH_3CFCl_2 and CH_3CF_2Cl.

Appellant's principal arguments are that the claimed invention taken as a whole would not be obvious over the "Pennwalt Process" and Ukaji because (1) one having ordinary skill in the art would not combine the continuous "Pennwalt Process" with the batch process of Ukaji since the vapor/liquid equilibrium considerations directing the selection of the molar feed ratio of the continuous process are neither suggested by nor play any role in the Ukaji batch process; (2) Ukaji teaches away from the invention since Ukaji suggests that the HF:CH_3CCl_3 molar ratio should be decreased, rather than increased, to promote the

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[6] The minimum molar feed ratio was calculated using the equation set forth in claim 1. The examiner determined that for a reaction time of 120 minutes (2 hours), X = .745 and Y = .255. Therefore:

$$M = 2.7X + 4.2Y = 2.7(.745) + 4.2(.255) = 3.1$$

unexpected coproduction of CH_3CFCl_3 and CH_3CFCl_2 by the "Pennwalt Process;" and (3) but for the discovery of what appellant asserts is a heretofore unknown HF/CH_3CFCl_2 azeotrope carrying more HF than the HF/CH_3CF_2Cl azeotrope, the continuous production of CH_3CFCl_2 would be deemed impossible.

We have carefully reviewed the record before us. This review leads us to conclude that the examiner's rejection is sustainable for the reasons set forth in the opinion below.

OPINION

Appellant has admitted that the apparatus illustrated in the single drawing figure in this application is prior art. It is clear to us that the "Pennwalt Process" apparatus as described by appellant inherently includes process variables which will affect the distribution of the products ultimately produced. These variables include, *inter alia*, the $HF:CH_3CCl_3$ molar feed ratio; the rate at which the HF and CH_3CCl_3 are fed into the reaction vessel; the reaction or residence time of the HF and CH_3CCl_3 in the reaction vessel including product produced which may be in the liquid phase; the temperature in the reaction vessel, the distillation column, and the reflux condenser; the pressure in the system; the reflux ratio; and the rate at which compounds (reaction product and HF or HCl) in the vapor phase

above the reaction vessel are removed from the apparatus. Some of these process variables also exist in the process taught by Ukaji, such as the initial HF:CH_3CCl_3 molar ratio, the temperature of the reaction, and the reaction time.[7] In describing the "Pennwalt Process," the only variables appellant discloses are the molar feed ratio and the reflux ratio.

It is known from Figures 1 and 2 of Ukaji that a reaction of *about 1 to 5 moles* of HF with one mole of CH_3CCl_4 will produce a product mixture comprising of CH_3CFCl_2 and CH_3CF_2Cl with trace amounts of CH_3CF_3.[8] It is also known from Figures 1 and 2 and Example 2 of Ukaji, that, if the reaction vessel contains an excessive amount of HF and a very small amount of CH_3CCl_3, for example a HF:CH_3CCl_3 molar ratio of 30 or more, it is expected that again a mixture of CH_3CFCl_2 and CH_3CF_2Cl will be produced. Ukaji further teaches that if the conditions in the reaction vessel are such that when there is a very high ratio of HF to CH_3CCl_3, the excess HF will begin to react with any CH_3CFCl_2

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[7] See Figures 1 and 2 of the Ukaji patent which graphically illustrate the affect of temperature and the HF:CH_3CCl_3 molar ratio on yields of CH_3CFCl_2, CH_3CF_2Cl, and CH_3CF_3 and on the amount of CH_3CCl_3 remaining. A description of these figures is at column 2, lines 27-39. Tables 1 and 2 in column 3 of the patent shows the effect of reaction time and the HF:CH_3CCl_3 molar ratio on yields of CH_3CFCl_2, CH_3CF_2Cl, and CH_3CF_3 and on the amount of CH_3CCl_3 remaining in the reactor. Adjusting the initial molar ratio, the reaction time and the temperature of the reaction, could result in the amount of CH_3CFCl_2 produced being as much as 80 wt% as illustrated in Figures 1 and 2.

[8] Although Ukaji desires a molar ratio of HF:CH_3CCl_3 of at least 4, the graphical illustrations in Figures 1 and 2 show that CH_3CFCl_2 could be formed when the molar ratio is as little as 1:1.

present in the reaction vessel to form more CH_3CF_2Cl.[9] It is also clear from the teachings of Ukaji that under such reaction conditions, the formation of CH_3CF_3 is not favored even though significant amounts of CH_3CFCl_2 may react with HF to form CH_3CF_2Cl.[10]

Appellant has admitted that even though the HF:CH_3CCl_3 molar feed ratio in the "Pennwalt Process" is less than 3, the molar ratio in the reaction vessel is significantly greater than the molar feed ratio.[11] These conditions are similar to that taught by Ukaji wherein a mixture of CH_3CFCl_2 and CH_3CF_2Cl are produced. Thus, if the sole product of the "Pennwalt Process" is CH_3CF_2Cl, then from the teachings of Ukaji it must be concluded that nearly all of the CH_3CFCl_2 must remain in the reaction vessel to react with HF to be converted to CH_3CF_2Cl. It is known from appellant's disclosure of the "Pennwalt Process" that HF is continuously refluxed back from the vapor phase above the reac-

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[9] See the results of Example 2 in Table 2 in column 3 of Ukaji. Compare also Figures 1 and 2 of Ukaji where the HF:CH_3CCl_3 ratio is greater than 15:1.

[10] The data in Table 2 associated with Example 2 in Ukaji shows that even when almost all of the CH_3CFCl_2 has been converted to CH_3CF_2Cl, a very small amount of CH_3CF_3 is formed.

[11] In paragraph 9 of the Declaration of John A. Wismer Under 37 CFR 1.132 (Paper No. 4) in application 07/365,345, appellant states that the "liquid phase reaction mixture [in the reaction vessel] contains a higher concentration of HF than either the reaction feed [the molar feed ratio] or the overhead product [above the reaction vessel]."

tion vessel back to the liquid phase mixture in the reaction vessel. Since the boiling point of CH_3CFCl_2 is greater than HF, it would be expected that if the conditions are set for HF to be refluxed back into the liquid phase reaction mixture, then any CH_3CFCl_2 in the vapor phase will be also refluxed back into the liquid phase reaction mixture.[12]

Appellant discloses the reflux ratio for the "Pennwalt Process" to be 1.5. If the reflux ratio was zero, then no vapor from the reaction vessel, including HF, would be condensed and returned to the liquid phase reaction mixture. Since it is known from the teaching of Ukaji that a reaction of HF and CH_3CCl_3 will produce a mixture of CH_3CFCl_2 and CH_3CF_2Cl, one having ordinary skill in the art would expect that if the reflux ratio of the "Pennwalt Process" is zero, a mixture of at least CH_3CFCl_2 and CH_3CF_2Cl can be expected. Thus, the prior art taken as a whole would suggest that if the reflux ratio is less than 1.5, a mixture of at least CH_3CFCl_2 and CH_3CF_2Cl in the overhead vapor phase should result. Moreover, we are of the opinion in view of the teachings of the prior art that there is a reasonable

[12] In paragraph 5 in the Declaration of Michael Bolmer, Ph.D. Under 37 CFR 1.132 (Paper No. 30) filed on May 1, 1992 in application 07/879,068, the boiling point of HF is disclosed to be 18°C whereas the boiling point for CH_3CFCl_2 is 32°C.

expectation of obtaining a desired amount of product by adjusting other variables of the "Pennwalt Process," such as the HF:CH_3CCl_3 molar feed ratio, the rate at which the reactants are fed into the reaction vessel, and the rate at which the reaction product is withdrawn from the apparatus. *In re Clinton*, 527 F.2d 1226, 188 USPQ 365 (CCPA 1976); *In re Kronig*, 539 F.2d 1300, 190 USPQ 425 (CCPA 1976); *In re Lamberti*, 545 F.2d 747, 192 USPQ 278 (CCPA 1976).

TABLE A below summarizes the results in the four working examples set forth in appellant's specification. The reaction time, the molar feed ratio and the minimum molar ratio (M) are compared to the yields of CH_3CFCl_2 and CH_3CF_2Cl.

TABLE A

Example	Reaction Time (hrs)[13]	Reflux Ratio	$HF:CH_3CCl_3$ Molar Feed Ratio	M[14]	CH_3CFCl_2 Yield (wt.%)	CH_3CF_2Cl Yield (wt.%)	% CH_3CCl_3 Convert[15]
1	3.5	0.62	3.9:1	3.9	43.3	9.1	98%
2	3.35	0.98	3.9:1	3.9	44.3	9.2	100%
3	4.5	0.92	2.9:1	3.6	31.9	20.3	92%
4	5.2	0.80	3.5:1	3.3	21.1	29.5	98.2%

The results set forth in the table are clearly expected following the teachings of Ukaji, i.e. a mixture of CH_3CFCl_2 and CH_3CF_2Cl is expected and that the yields of the products formed are dependent on the reaction time. It is equally clear that no criticality has been established regarding the molar feed ratio, the reflux

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[13] Appellant used the expression "average reactant residence time" in describing the time for the reaction. The expression is not defined in the specification. See Examples 1-4 on pages 11-13 of the specification. The term "reactant residence time" is also used on page 8, lines 15 and 16 of the specification, but again it is not defined. In the absence of a definition, we consider the "average reactant residence time" to be the same as the "Reaction time" in Tables 1 and 2 in column 3 of Ukaji.

[14] Appellant did not disclose the value of M in each of the working examples. The values in TABLE A were arrived at by computing the moles for each product from the wt.% given in the examples to obtain a total moles of CH_3CFCl_2 and CH_3CF_2Cl and then computing the mole fraction for each product. The value of M was computed using the equation set forth in Claim 1.

[15] The percentage represents what appellant terms the "calculated 1,1,1-trichloroethane utilization" (Examples 1,2 and 4) or the "calculated 1,1,1-trichloroethane conversion" (Example 3). See also page 7, lines 11-14 of appellant's specification where appellant states that below the "theoretical" minimum molar feed ratio (M) predicted by the equation in claim 1, "substantially less than complete conversion [of] 1,1,1-trichloroethane is achieved, indicating unsteady state reaction behavior."

ratio or the value of M relative to the yield of the products formed.

Appellant argues that the molar feed ratio is critical in that it must be carefully selected to prevent "phase separation."[16] Appellant maintains that, in Ukaji, "phase separation" would be expected to occur for a $HF:CH_3CCl_3$ molar ratio of 4.3. Appellant relies on a conclusionary statement made in a declaration by Michael Bolmer.[17] There is no disclosure in Ukaji that phase separation occurs and appellant has not provided any evidence to support Mr. Bolmer's conclusion. Mr. Bolmer's conclusionary statement is not factual evidence. See *In re Lindner*, 457 F.2d 506, 173 USPQ 356 (CCPA 1972). Also, it would appear from appellant's specification, that even in the claimed process, "phase separation" can be expected within the claimed molar feed ratio. Appellant states in his specification[18] that

> The amount of unreacted [CH_3CCl_3] left in the reaction vessel is very low, typically less than 2% of the reactor feed, by weight. Any [CH_3CCl_3] which precipitates from the reaction phase may be periodically withdrawn from the

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[16] See footnote 5.

[17] In paragraph 3 of the Declaration of Michael Bolmer (Paper No. 30) filed in application 07/879,068 on May 1, 1992, Mr. Bolmer states that "phase separation would be expected to occur at the 4.3:1 HF:[CH_3CCl_3] ratio of Ukaji Example 1.

[18] Appellant's specification, page 6, lines 9-18.

> reactor bottom. Since the present invention maximizes the conversion of [CH_3CCl_3], the formation of precipitated [CH_3CCl_3], and the need to periodically withdraw the same from the reactor bottom, is kept to a minimum.

This by no means establishes criticality of the claimed molar ratio to prevent "phase separation."

Appellant also contends that the molar feed ratio is critical for maintaining "steady state behavior" in the claimed continuous process for producing CH_3CFCl_2 and CH_3CF_2Cl. Appellant further urges that the claimed process is not obvious over the "Pennwalt Process" in combination with Ukaji since Ukaji fails to suggest the narrow range for the HF:CH_3CCl_3 molar feed ratio and a narrow range for the minimum molar feed ratio (M) as defined by the equation in claim 1, *supra*. Appellant asserts that both M and the HF:CH_3CCl_3 molar feed ratio range are critical for maintaining the "steady state behavior" of the claimed process and for the continuous production of the CH_3CFCl_2/CH_3CF_2Cl mixture. Although appellant has not specifically defined in his specification the meaning of the expression "steady state behavior," from the context in which the expression is used in the specification and in the examples presented, the expression is believed to mean the desire to achieve nearly complete conversion of CH_3CCl_3 to

CH_3CFCl_2 and CH_3CF_2Cl, i.e. at least 98% conversion.[19] Appellant has not presented any evidence that the "Pennwalt Process" did not exhibit "steady state behavior" due to the molar feed ratio. Example 3 in appellant's specification followed the procedure in Example 1 in his specification and utilized a molar feed ratio of 2.9:1 instead of 3.9:1. In Example 1, appellant claims to achieve 98% conversion, indicating "steady state behavior," but only 92% conversion in Example 3 which he regards as indicating "unsteady state behavior." See TABLE A, *supra*. We do not see that the results of these examples are properly comparable because in addition to changing the molar feed ratio, the reflux ratio and the pressure in the system in each example were significantly different. Both of these variables would affect the amount of conversion of CH_3CCl_3 to CH_3CFCl_2 and CH_3CF_3. Moreover, the examples in Ukaji are seen to have "steady state behavior" within the context of appellant's specification since both Tables 1 and 2, as well as Figures 1 and 2, in Ukaji show the tendency of the HF/CH_3CCl_3 reaction toward complete conversion CH_3CCl_3 to CH_3CFCl_2, CH_3CF_2Cl and CH_3CF_3. For these reasons, we do not find that appellant has established the molar feed ratio to be critical.

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[19] See appellant's specification: page 3, lines 28-31; page 7, lines 6-14; page 10, line 30 to page 11, line 6; Example 1, page 11; and Examples 3 and 4 on pages 12 and 13. Appellant speaks in terms of the "calculated" 1,1,1-trichloroethane "utilization" or "conversion."

Appellant's argument regarding the unexpected reversal of the gas/liquid ratios of HF and CH_3CFCl_2 attributable to the HF/ CH_3CFCl_2 azeotrope has not been considered since the ratios are neither disclosed in appellant's specification nor claimed subject matter in the claims on appeal.

Appellant urges that the mininum molar feed range defined by the equation in claim 1 is critical since it is derived in part from the composition of the heretofore unknown HF/CH_3CFCl_2 azeotrope. We disagree because the data in TABLE A, *supra*, does not demonstrate that the range is critical. Appellant disputes the examiner's calculation of the M value for Example 1 of Ukaji because the initial molar ratio of 4.3:1 in the reaction vessel is an initial charge, and not a constant feed ratio, and that the HF concentration in the vessel decreases as it is consumed by the reaction with CH_3CCl_3 and CH_3CFCl_2. We are not persuaded by appellant's argument because, at the same time HF concentration is decreasing, the concentration of CH_3CCl_3 is also decreasing.

Appellant contends that the prior art does not teach the unexpected result that it is necessary to increase, rather than decrease, the HF:CH_3CCl_3 molar feed ratio to increase the ratio of CH_3CFCl_2 to CH_3CF_2Cl in the product mixture. Appellant has not demonstrated that the molar feed ratio alone is the cause

for the increase in the product mixture ratio. The molar feed ratio is not the only variable which can affect the product ratio mixture. For example, as discussed *supra*, the reflux ratio could also affect the ratio.

Appellant argues that the "Pennwalt Process" and Ukaji are incompatible because Ukaji is a batch process, and not a continuous process. We find no merit in this argument. Appellant's admitted prior art is a continuous process where a constant molar ratio of $HF:CH_3CCl_3$ is fed to the reactor vessel and the vapor phase product is continuously withdrawn and passed through a refluxing means to provide a constant product distribution. Unless the process produces unexpected beneficial results, merely operating the process in a continuous manner does not render the invention unobvious. *In re Lincoln*, 126 F.2d 477, 53 USPQ 40 (CCPA 1942); *Ex parte Beeber*, 123 USPQ 221 (PO Bd. App. 1959). See also *In re Aller*, 220 F.2d 454, 105 USPQ 233 (CCPA 1955). For reasons already given, we find that appellant has not demonstrated that his claimed invention provides unexpected results over that predicted by Ukaji for $HF:CH_3CCl_3$ molar ratios of at least 4.

Thus, having considered all of the evidence of record, we find that the evidence of obviousness, on balance, outweighs the evidence of nonobviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). Hence, we agree with the examiner's ultimate legal conclusion that the claimed subject matter would have been obvious to one of ordinary skill in the art. Accordingly, the decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR 1.136(a).

AFFIRMED

MELVIN GOLDSTEIN)
Administrative Patent Judge)
)
)
EDWARD C. KIMLIN)
Administrative Patent Judge) BOARD OF PATENT APPEALS AND INTERFERENCES
)
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