

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILLIAM B. FARNHAM and MARIO J. NAPPA

Appeal No. 95-5067
Application 08/064,575¹

ON BRIEF

Before SOFOCLEOUS, OWENS, and WALTZ, **Administrative Patent Judges**.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 13 through 15, 19, 21/19, 22/21/19, 23/22/21/19 and 24/22/21/19. Claims 28 and 70 have been indicated as allowable by the examiner (see the Advisory

¹ Application for patent filed May 21, 1993. According to appellants, the application is a continuation-in-part of Application 07/645,030, filed January 23, 1993, now Patent No. 5,243,025, issued September 7, 1993; which is a continuation-in-part of Application 07/243,396, filed September 12, 1988, now abandoned.

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Action dated Feb. 14, 1995, Paper No. 15) with claims 16 through 18, 20, 21/20, 22/21/20, (23-24)/22/21/20, 25, 26, and 29-60 standing withdrawn from consideration by the examiner due to a species election (brief, pages 1-2).

According to appellants, the invention is directed to a method of making partially fluorinated ethers by the catalyzed polycondensation reaction of a silyl ether with a fluorinated olefin at a reaction temperature in the range of about -50 to about 120EC. (brief, page 3). Claim 13 is illustrative of the subject matter on appeal and is reproduced below:

13. A process for producing partially fluorinated ethers, comprising the catalyzed polycondensation of a silyl ether and a fluorinated olefin in the presence of a suitable catalyst, conducted within a temperature range of -50BC to 120BC.

The examiner has relied upon the following references as evidence of obviousness:

Gash 1970	3,549,606	Dec. 22,
Air Reduction Co. (GB '477) 1957 (Published Great Britain Patent Specification)	782,477	Sep. 4,
Scherer et al. (EP '114) 1983 (Published European Patent Application)	0 077 114	Apr. 20,

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Kricheldorf et al. (Kricheldorf '83), "New Polymer Synthesis", *J. Poly. Sci., Poly. Chem. Ed.*, 21, 2283-2289 (1983)

Kricheldorf et al. (Kricheldorf '84), "New Polymer Syntheses", *Polymer*, 25, 1151-1156 (1984)

Saunders, "Direct Conversion of Aryl Silyl Ethers to Alkyl Aryl and Diaryl Ethers", *Synthesis*, 5, *Communications*, 377-379 (1988)

Appellants have relied upon the following reference in rebuttal of the examiner's rejection:

Morrison et al. (Morrison), *Organic Chemistry*, 3rd ed., 821-826, Allyn and Bacon, Inc., Boston (1973)

Claims 13 through 15, 19, 21/19, 22/21/19, 23/22/21/19 and 24/22/21/19 stand rejected under 35 U.S.C. § 103 as unpatentable over EP '114, GB '477, and/or Gash in view of Kricheldorf '83, Kricheldorf '84 and/or Saunders (answer, page 3). We reverse this rejection for reasons which follow.

OPINION

The process of appealed claim 13 requires the polycondensation of a silyl ether and a fluorinated olefin in the presence of a suitable catalyst at a temperature range of -50 to 120EC. to form a partially fluorinated ether.

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The examiner applies the primary references (EP '114, GB '477, and/or Gash) to show that the condensation reaction of alcohols with fluorinated olefins to form fluorinated ethers is well known (answer, page 3). The examiner applies the secondary references (Saunders and Kricheldorf '83 and '84) to show that silyl ethers in the presence of fluoride ions generate phenolate or alkoxide ions which react with halogen derivatives to form ethers (answer, page 5). The examiner then concludes that it would have been obvious to the artisan to modify the synthesis of fluorovinyl ethers as disclosed by the primary references by first "derivatizing" the alcohols to trimethylsilyl ethers and using a catalyst such as cesium fluoride or tetrabutylammonium fluoride as taught by the secondary references "in order to employ more economical reaction conditions of lower temperatures, the use of less corrosive materials (no alkoxide salts) and to avoid the separation from large quantities of inorganic salts." (*Id.*).

The examiner bears the initial burden of presenting a *prima facie* case of obviousness based on the disclosures of the applied prior art references. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). "When it

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is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by applicant." *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). There are "three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 149 F.3d 1350, 1358-59, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998).

The examiner alludes to the problems of corrosive materials and separation of large quantities of inorganic salts (answer, pages 5 and 6) but the primary references fail to disclose or teach these problems.² The secondary reference to Kricheldorf '83 appears to be the only reference that discloses a problem with previous procedures because of the need to purify the product from metal salts (page 2283). Of course, this reference is not directed to the formation of

² In fact, EP '114 does not even disclose or teach the use of alkali but employs triethylamine as the base in the conventional condensation of an alcohol with a fluorinated olefin (see pages 14 and 15).

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ethers from the condensation of alcohols with fluorinated olefins.

The examiner does not refer to any specific knowledge of persons skilled in the art. Therefore the suggestion or motivation to combine the references must come from the teachings of the references themselves. *See In re Rouffet, supra.* However, on this record, we fail to find any reason, motivation or suggestion to combine the references in the manner suggested by the examiner.

The examiner notes that Kricheldorf '83 concludes that "the fluoride ion converts the trimethylsilyloxy group into a phenolate ion which in turn attacks the activated fluorine-carbon bond of the diphenyl sulfone" (Kricheldorf, page 2286, and see also the answer, page 4, last paragraph). The examiner then applies this teaching from Kricheldorf '83 (and the secondary references in general) to the reaction disclosed by the primary references, which involves the nucleophilic displacement of a vinylic fluoride ion by an alkoxide ion (answer, paragraph bridging pages 3-4, and page 5). However, Kricheldorf '83, and the other secondary references in general, only teaches that the cesium alkoxide or phenolate

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salt "attacks the activated fluorine-carbon bond of the diphenyl sulfone" (Kricheldorf '83, page 2286). The fluorine of Kricheldorf '83 and '84 is attached to an aromatic ring. There is no disclosure, teaching or suggestion, in the record before us, that the cesium alkoxide or phenolate would attack the **vinyllic** fluoride reactant of the primary references. Accordingly, we find no suggestion or motivation to combine the primary and secondary references in the manner suggested by the examiner.

The Saunders secondary reference differs from Kricheldorf '83 and '84 in disclosing the reaction of a silyl ether with alkyl halide to form alkyl aryl ethers (page 377). As noted above, we find no suggestion or motivation to apply the teachings of Saunders to the reaction of alcohols with the vinyllic fluorides of the primary references. Furthermore, appellants have submitted Morrison to show that "attempts to convert aryl or vinyl halides into ... ethers... by treatment with the usual nucleophilic reagents are also unsuccessful" (sentence bridging pages 823-24).

For the foregoing reasons, we conclude that the examiner has failed to establish a *prima facie* case of obviousness for

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the claimed subject matter in view of the applied prior art references. Accordingly, the rejection of claims 13-15, 19, 21/19, 22/21/19, 23/22/21/19 and 24/22/21/19 under 35 U.S.C. § 103 as unpatentable over EP '114, GB '477, and/or Gash in view of Kricheldorf '83, Kricheldorf '84, and/or Saunders is reversed.

REVERSED

Michael Sofocleous)
Administrative Patent Judge)
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PATENT) BOARD OF
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	Administrative Patent Judge) APPEALS AND
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