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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHINICHI MINAMI,¹
MASAKI FUKUMORI, TETSUYA UEHARA,
HISAKO NAKAMURA, and IKUO YAMAMOTO

Appeal 2019-001490
Application 14/369,425
Technology Center 1700

Before MARK NAGUMO, MICHAEL P. COLAIANNI and
GEORGE C. BEST, *Administrative Patent Judges*.

NAGUMO, *Administrative Patent Judge*.

DECISION ON APPEAL

Daikin Industries, LTD (“Minami”) timely appeals under 35 U.S.C. § 134(a) from the Final Rejection² of claims 1, 5–13, 15–19, 23, and 24.³ We have jurisdiction. 35 U.S.C. § 6. We reverse.

¹ The applicant under 37 C.F.R. § 1.46, and hence the appellant under 35 U.S.C. § 134, is the real party in interest, identified as Daikin Industries, LTD. (Appeal Brief, filed 21 May 2018 (“Br.”), 2.)

² Office Action mailed 25 August 2017 (“Final Rejection”; cited as “FR”).

³ Remaining copending claim 14 has been withdrawn from consideration by the Examiner (FR 1, § 5a), and is not before us.

OPINION

A. Introduction⁴

The subject matter on appeal relates to fluorine-containing polymers said to be useful as water- and oil-repellant agents and as soil-resistant agents that can be applied to textiles, masonry, electrostatic filters, etc. (Spec. 1 [0001].) The inventive polymer compositions, which are said to be improvements over prior art compositions disclosed by Enomoto⁵ (*id.* at 3 [0006]), differ in that an alphachloroacrylate monomer having a fluoroalkyl group is required, and there are no repeating units formed from a halogenated olefin, such as vinyl chloride.

Claim 1 is representative and reads:

A fluorine-containing composition comprising a fluorine-containing polymer which consists essentially of:

- (A) repeating units formed from a fluorine-containing monomer which is alphachloroacrylate having a fluoroalkyl group,
- (B) repeating units formed from a (meth)acrylate monomer which is free from a fluoroalkyl group and which has a linear or branched hydrocarbon group, and
- (C) repeating units formed from a (meth)acrylate monomer which is free from a fluoroalkyl group and which has a cyclic hydrocarbon group,

⁴ Application 14/369,425, *Fluorine-containing composition and fluorine-containing polymer*, filed 27 June 2014 as the national stage under 35 U.S.C. § 371 of PCT/JP2012/082220, filed 12 December 2012, claiming the benefit of an application filed in Japan on 28 December 2011. We refer to the “425 Specification,” which we cite as “Spec.”

⁵ Full cite at 3 n.9, *infra*. Present inventors SM, HN, and IY are listed as coinventors on Enomoto.

wherein the monomer (B) having a linear or branched hydrocarbon group is an acrylate of the formula:



wherein

A₁ is a hydrogen atom or a methyl group, and

A₂ is an alkyl group represented by C_nH_{2n+1} where n is 1–30,

wherein the fluorine-containing polymer is free from repeating units formed from a halogenated olefin, and

wherein the monomer (A) is a fluorine-containing monomer represented by the formula:



wherein

Y is -O[-];

Z is a direct bond or divalent organic group; and

Rf is a fluoroalkyl group having 1 to 20 carbon atoms.

(Claims App., Br. 23–24; some formatting and emphasis added.)

The Examiner maintains the following grounds of rejection^{6, 7}:

- A. Claims 1, 5–12, 15, 17–19, 23⁸, and 24⁸ stand rejected under 35 U.S.C. § 102(b) in view of Enomoto.⁹
- A1. Claims 1, 5–13, 15–19, 23⁸, and 24⁸ stand rejected under 35 U.S.C. § 103(a) in view of Enomoto.

⁶ Examiner’s Answer mailed 3 October 2018 (“Ans.”).

⁷ Because this application was filed before 16 March 2013, the effective date of the America Invents Act, we refer to the pre-AIA version of the statute.

⁸ Heading corrected; Advisory Action 14 February 2017§ 12 (continuation sheet).

⁹ Takashi Enomoto et al., *Water and oil-repellent composition*, WO 2010/030044 A2 (18 March 2010) (assigned to Daikin Industries, Ltd., the real party in interest in this appeal).

B. Discussion

The Board's findings of fact throughout this Opinion are supported by a preponderance of the evidence of record.

Minami urges that the Examiner erred in finding that Enomoto describes embodiments of the claimed polymer composition. In particular, Minami urges the Examiner erred in finding that the monomer disclosed by Enomoto, $\text{CH}_2=\text{C}(-\text{X})-\text{C}(=\text{O})-\text{Y}-\text{Z}-\text{Rf}$, where X is H, a monovalent organic group, or a halogen atom, and Y is $-\text{O}-$ or $-\text{NH}-$, describes, within the meaning of 35 U.S.C. § 102, the repeating unit (A), which is an alphachloroacrylate having a fluoroalkyl group represented by the formula $\text{CH}_2=\text{C}(-\text{Cl})-\text{C}(=\text{O})-\text{Y}-\text{Z}-\text{Rf}$ (Z and Rf being defined the same way). (Br. 12–13.) In Minami's view, the extent of necessary picking and choosing is too great to say that the particular repeating unit (A) would have been at once envisaged. (*Id.*)

Minami urges further (Br., para. bridging 13–14) that choices must also be made to select repeating unit (B), a (meth)acrylate monomer having a linear or branched hydrocarbon group and being free from a fluoroalkyl group, from the “other monomers” disclosed by Enomoto. In particular, the “other monomers” disclosed by Enomoto (Enomoto 13, l. 23–15, l. 10), include, in addition to the (meth)acrylate esters (*id.* at 15, ll. 1–10) required by the appealed claims, preferably monomers such as ethylene, vinyl acetate, vinyl chloride, and vinylidene chloride (*id.* at 14, ll. 6–24). Thus, the degree of picking and choosing to arrive at repeating unit (B) is also considerable.

Minami concludes that the rejection for anticipation by Enomoto must be reversed. (Br. 17, last para.)

Our reviewing court has explained that “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but *must also disclose those elements arranged as in the claim.*” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (internal quote and citation omitted; emphasis added). A chemical formula that provides a very large number of possible groups (the group X in can be “a monovalent organic group,” (Enomoto 4, l. 25)), without guidance towards the element of interest—here, chlorine—can at best suggest, but not, without more, “describe” embodiments having particular substitutions. Moreover, there are other choices that must be made, in particular, from among the very large number of “other monomers” suggested by Enomoto, of which vinyl chloride is especially preferred.

Furthermore, in the leading cases in which a small genus was found to provide a description of the individual members of the genus, the genus was found to “embrace[] a very limited number of compounds closely related to one another in structure” (*In re Schaumann*, 572 F.2d 312, 316 (CCPA 1978)); or the reference was found to provide a “pattern of . . . specific preferences [that] in connection with his generic formula constitutes a description of a definite and limited class of compounds” (*In re Petering*, 301 F.2d 676, 681 (CCPA 1962)). The Examiner has not come forward with credible evidence or a plausible explanation that a small genus is described for either of Enomoto monomers (A) or (C), or for the combination of monomers (A), (B), and (C), such that the particular polymeric composition covered by claim 1 can be said to be “at once envisaged.”

We reverse the rejection for anticipation.

In arguing against the rejection for obviousness, Minami points out that all of the working examples provided by Enomoto include vinyl chloride. (*Id.* at 13–14.) Minami relies on a declaration¹⁰ submitted by inventor Shinichi Minami during examination. The Minami Declaration shows that polymers including vinyl chloride provide significantly inferior water repellency than polymers of the invention, which do not incorporate vinyl chloride. (Decl. 4–5; Br. 15.) Minami urges that the differences in properties of the polymers due to the vinyl chloride compared to the alkyl (meth)acrylates are evidence of unexpected results that rebut any prima facie case of obviousness established by the Examiner. (Br. 18–19.) Minami also urges that the Minami Declaration shows that the presence of styrene and of vinyl acetate also deteriorate water repellency. (Decl. 5; Br. 19.) Minami points further to the comparison in the '425 Specification of otherwise identical polymers that differ only in the use of an alphachloroacrylate monomer having a fluoroalkyl group (Spec. 27 [0058], Preparative Example 1), and the corresponding (meth)acrylate monomer (*id.* at 29–30 [0062], Comparative Preparative Example 1). As indicated in Table A, reproduced on the next page, Preparative Example 1 provides a strong water repellency test value of 100, and “Good” tackiness (i.e., “[t]ackiness is not felt at all” (Decl. 3) , while Comparative Example 1 provides a strong water repellency test value of 0, and “Bad” tackiness (i.e., “[t]ackiness is felt” (*id.*)).

¹⁰ Declaration by Shinichi Minami, filed 10 August 2017 (“Decl.”).

{Table A is shown below }

Table A

Example			Ex. 1		Ex. 2		Ex. 3		Ex. 4		Com. Ex. 1		Com. Ex. 2	
Preparative Example			Pre. Ex. 1		Pre. Ex. 2		Pre. Ex. 3		Pre. Ex. 4		Com. Ex. 1	Pre. Ex. 1	Com. Ex. 2	Pre. Ex. 2
	Monomer (Weight ratio)		FCL/S/IB= 30/20/50		FCL/S/CH= 30/20/50		FCL/S/IB= 50/14/36		FCL/S/CH= 50/14/36		FM/S/IB= 30/20/50		FCL/S= 30/70	
Shower water repellency test	Treatment conc.		0.50 %	0.75 %	0.50 %	0.75 %	0.50 %	0.75 %	0.50 %	0.75 %	0.50 %	0.75 %	0.50 %	0.75 %
	PET		90	100	90	100	90	100	90	100	70	90	70	90
Strong water repellency test														
	PET	1.00%	100		100		100		100		0		80	
Tackiness test			Good		Good		Good		Good		Bad		Good	

{Table A (Spec. 33 [0067]) shows results of water repellency and tackiness tests for inventive and comparative polymer compositions }

The weight of the evidence supports Minami.

On the basis of the teachings of Enomoto, which presents the various “other monomers” as rough equivalents, one would have expected that the vinyl chloride-containing monomers would provide the best performance, and that substitution of other monomers, such as acrylate esters, would provide roughly comparable results. The evidence of significantly improved results due to the absence of vinyl chloride, and the direct comparison of alpha-chloro substitution with alpha-methyl substitution, in our judgment, whether considered as evidence of unpredictability that undercuts the prima facie case of obviousness, or as evidence of unexpected results that rebuts the prima facie case of obviousness, outweighs the suggestion of the presently claimed subject matter provided by Enomoto.

We reverse the rejection for obviousness.

Appeal 2019-001490
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C. Order

It is ORDERED that the rejections of claims 1, 5–12, 15, 17–19, 23, and 24 for anticipation and for obviousness in view of Enomoto is reversed.

REVERSED