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. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HENRY G. HUGHES

Appeal No. 1997-3415
Application No. 08/037,849

ON BRIEF

Before THOMAS, KRASS and FLEMING, **Administrative Patent Judges**.

FLEMING, **Administrative Patent Judge**.

DECISION ON APPEAL

This a decision on appeal from the final rejection of claims 16-26, all of the claims pending in the present application.

Claims 1-15 and 27 and 28 have been canceled.

The invention relates to spin-on dielectrics for use in manufacturing semiconductors. On pages 1 and 2 of the

specification, Appellant discloses that prior art spin-on class had dielectric constants in excess of 3.8.

Appellant further points out that it would be desirable to have a spin-on dielectric having a lower dielectric constant.

On page 2 of the specification, Appellant discloses that a spin-on dielectric having a lower dielectric constant is achieved by creating a spin-on dielectric that is a silicon based siloxane polymer wherein each silicon atom in the polymer is bonded to a polarization reducing group, and to three oxygen atoms each of which is bonded to one other silicon atom.

Appellant's claim 16 is reproduced as follows:

16. A method of forming a dielectric layer on a semiconductor wafer comprising:

providing a semiconductor wafer having a surface;

forming a mixture by combining ingredients consisting essentially of an organosilane compound having an aromatic group on every silicon atom, a solvent, a catalyst, and water; and

forming the dielectric layer on the surface of the semiconductor wafer by curing the mixture on the surface so that the mixture forms a siloxane polymer having an aromatic group attached to every silicon atom of the polymer.

The Examiner relies on the following references:

Nugent et al. (Nugent)	3,414,540	Dec. 3, 1968
Nozue et al. (Nozue)	4,626,556	Dec. 2, 1986

Claims 16-26 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Nozue and Nugent.

Rather than reiterate the arguments of Appellant and Examiner, references are made to the briefs[1] and answer[2] for the respective details thereof.

OPINION

We will not sustain the rejection of claims 16-26 under 35 U.S.C. § 103.

The Examiner has failed to set forth a **prima facie** case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed

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[1] Appellant filed an appealed brief on February 2, 1996. Appellant filed a reply brief on May 21, 1996. The Examiner filed a supplemental Examiner's answer in response to the reply brief on July 9, 1996, thereby entering and considering the reply brief.

[2] The Examiner filed an Examiner's answer on May 1, 1996. The Examiner filed a supplemental examiner's answer on July 9, 1996.

invention by the express teachings or suggestions found in the prior art, or by implications contained in such teachings or suggestions. **In re Sernaker,** 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983). "Additionally, when determining obviousness, the claimed invention should be considered as a whole; there is no legally recognizable 'heart' of the invention." **Para-Ordnance Mfg. v. SGS Importers Int'1, Inc.,** 73 F.3d 1085, 1087, 37 USPQ2d 1237, 1239 (Fed. Cir. 1995), **cert. denied,** 519 U.S. 822 (1996), **citing W. L. Gore & Assocs., Inc. v. Garlock, Inc.,** 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983), **cert. denied,** 469 U.S. 851 (1984).

The Examiner does not dispute that neither Nozue nor Nugent teaches an aromatic group attached to each silicon atom.

However, the Examiner relies on Nozue's prior art statement found in column 1, lines 19-24, for this teaching.

Appellant argues on pages 3 and 4 of the brief that Nozue clearly teaches away from the use of Brown's polymer by stating that Brown provides a polymer that's inferior in heat resistant adhesion to a substrate. Appellant points to

Nozue's statement found in column 1, lines 27-29. Appellant argues that one of ordinary skill in the art would not be motivated to use a polymer that is described by Nozue as having inferior properties. Appellant further argues that Appellant's independent claims 16, 25, and 26 are methods for forming a dielectric layer on a semiconductor wafer. Appellant argues that even if a polymer structure having an aromatic group of silicon ends were shown by Brown, there is no suggestion by Brown to use this polymer in the manner recited in Appellant's claims.

The Federal Circuit states that "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." ***In re Fritch***, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992), citing **In re Gordon**, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). It is further established that "[s]uch a suggestion may come from the nature of the problem to be solved, leading inventors to look to references relating to possible solutions to that problem." ***Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.***, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996) ***citing In re Rinehart***,, 531 F.2d 1048, 1054, 189 USPQ 143, 149 (CCPA 1976)(considering the problem to be solved in a determination of obviousness). The Federal Circuit reasons in ***Para-0rdnance Mfg. Inc. v. SGS*** **Importers Int'l Inc**., 73 F.3d 1085, 1088-89, 37 USPQ2d 1237, 1239-40 (Fed. Cir. 1995), ***cert. denied***, 519 U.S. 822 (1996), that for the determination of obviousness, the court must answer whether one of ordinary skill in the art who sets out to solve the problem and who had before him in

his workshop the prior art, would have been reasonably expected to use the solution that is claimed by the Appellants. However, "[o]bviousness may not be established using hindsight or in view of the teachings or suggestions of the invention." ***Para-Ordnance Mfg. v. SGS Importers Int'l***, 73 F.3d at 1087, 37 USPQ2d at 1239, ***citing W.L. Gore & Assocs., Inc. v. Garlock, Inc.***, 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13. In addition, our reviewing court requires the PTO to make specific findings on a suggestion to combine prior art references. ***In re Dembiczak,*** 175 F.3d 994, 1000-01, 50 USPQ2d 1614, 1617-19 (Fed. Cir. 1999).

We note that Nozue does teach in column 1, lines 7-29, that Brown's polymers are inferior in heat resistant adhesion to a substrate. However, we will not go as far as Appellant's arguments that this in itself is enough to say that Nozue teaches away from using these polymers. However, the Examiner has the burden to show that one of ordinary skill in the art would have reasons to use Brown's round polymers instead of the polymers taught by Nozue as being the preferred polymers. The Examiner has not provided any evidence that one of

ordinary skill in the art would have made this modification to Nozue's method.

Furthermore, we fail to find that Nozue provides any reasoning to use an aromatic group attached to each silicon atom of
the polymer in a method of forming a dielectric layer in a semiconductor wafer.

We have not sustained the rejection of claims 16-26 under 35 U.S.C. § 103. Accordingly, Examiner's decision is reversed.

REVERSED

JAMES D. THOMAS Administrative Patent Judge	)	
ERROL A. KRASS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
MICHAEL R. FLEMING Administrative Patent Judge	)	

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