

The opinion in support of the decision being entered today is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MARIA RONAY

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Appeal 2006-2351  
Application 10/645,493  
Technology Center 3700

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Decided: July 25, 2007

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Before BRADLEY R. GARRIS, CHUNG K. PAK, and  
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals the final rejection of claims 17-36 under 35 U.S.C. § 134. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

## INTRODUCTION

Appellant claims a method for planarizing and polishing surfaces in the microelectronics industry (Specification 1). Appellant's method includes providing a liquid polish slurry composition comprising abrasive particles on the surface and contacting the surface with a polishing pad that consists essentially of a polymeric matrix and solid lubricant particles in an amount sufficient to reduce friction between the pad and surface during planarizing (claim 17).

Claims 17, 24, 32, and 34 are illustrative:

17. A method for planarizing a surface which is formed on a substrate which comprises providing on the surface to be planarized a liquid polish slurry composition comprising abrasive particles;

and contacting said surface with a polishing pad that consists essentially of a polymeric matrix and solid lubricant particles in an amount sufficient to reduce friction between the pad and surface during planarizing.

24. The method of claim 17, wherein the amount of solid lubricant particles is about 0.5 to about 30% by weight.

32. The method of claim 17, wherein said lubricant particles comprises at least one member selected from the group consisting of a binding agent, coupling agent or adhesive promoter.

34. A method according to claim 17, wherein the surface to be polished contains at least one low-k dielectric selected from the group consisting [*sic* of] low-k porous dielectric, low-k non-porous dielectric and air bridges and combinations thereof.

The Examiner relies on the following prior art references as evidence of unpatentability:

Horie	US 4,555,250	Nov. 26, 1985
Cook	US 5,489,233	Feb. 6, 1996
Nishida	US 5,714,700	Feb. 3, 1998
Bajaj	US 6,045,435	Apr. 4, 2000
Chiddick	US 6,136,757	Oct. 24, 2000
Murata	US 6,194,357 B1	Feb. 27, 2001
Molnar I <sup>1</sup>	US 6,283,829 B1	Sep. 4, 2001
Molnar II	US 6,390,890 B1	May 21, 2002

The rejections as presented by the Examiner are as follows:

1. Claims 17-19, 21-23, 28, 33, and 36 are rejected under 35 U.S.C. § 102(b) as being unpatentable over Molnar I.
2. Claim 20 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Nishida.
3. Claims 24-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Horie.
4. Claim 27 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Murata.
5. Claim 29 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Bajaj.
6. Claims 30 and 31 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Cook.
7. Claim 32 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Chiddick.

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<sup>1</sup> Roman numerals have been added to differentiate between Molnar U.S. Patent 6,283,829 B1 (i.e., Molnar I) and Molnar U.S. 6,390,890 B1 (i.e., Molnar II) in this opinion.

8. Claims 34 and 35 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Molnar II.

Appellant separately argues independent claim 17 and dependent claims 24, 32, and 34. Accordingly, non-argued dependent claims 18-23, 25-31, 33, and 35-36 stand or fall with the argued claims.

#### OPINION

#### 35 U.S.C. § 102(b) REJECTION OVER MOLNAR I INDEPENDENT CLAIM 17

Appellant argues that use of the claim phrase “consists essentially of,” when reciting the structure of the polishing pad in claim 17, excludes the presence of materials such as abrasive particles in the pad in amounts that would materially change the basic characteristics of the claimed invention (Br. 6). Appellant further contends that Molnar I’s finishing element (i.e., polishing pad) contains abrasive particles and thus is not encompassed by the restrictive claim language, “consists essentially of” (Br. 6). Appellant further argues that the portion of Molnar I’s disclosure relied on by the Examiner to support inherency, column 29, lines 8-11, relates solely to liquid slurry compositions wherein the lubricant and abrasive particles are contained in the slurry compositions not in a finishing element (i.e., pad) (Br. 6). Appellant argues that Molnar I discloses using both liquid and solid lubricants such that “one would have to make fortuitous selections among a myriad of possibilities” (Br. 7).

We have considered all of Appellant’s arguments and find them unpersuasive for the reasons discussed below.

Generally, by using the phrase “consisting essentially of” (i.e., “consists essentially of”), applicant signals that the invention necessarily includes the listed components in the claim and is open to unlisted components that do not materially affect the basic and novel properties of the invention. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). *See also, PPG Indus., Inc. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998) (citing *Ex parte Davis*, 80 USPQ 448, 449-50 (B.P.A.I. 1948)). With an invention claimed using “consisting essentially of” language, applicant bears the burden of showing that the basic and novel characteristics of the claimed invention would be materially affected by the presence of additional components in a prior art invention that otherwise corresponds to applicant’s claimed invention. *In re De Lajarte*, 337 F.2d 870, 874, 143 USPQ 256, 258 (CCPA 1964).

Appellant has proffered no showing that the phrase “consists essentially of” in claim 17 excludes abrasive particles in the polishing pad. Appellant has not shown that abrasive particles would materially affect the basic and novel characteristics of the claimed invention. *Id.* The basic and novel characteristic of the presently claimed invention is a greater friction reduction achieved by incorporating solid lubricant particles into the polishing pad rather than the slurry (Specification 9, ll. 1-4). Thus, to establish that the phrase “consists essentially of” in claim 17 excludes abrasive particles, Appellant needs to show that abrasive particles in the polishing pad (i.e., finishing element) materially affect the reduction in friction.

Moreover, during use, Appellant's method, like Molnar I's method, includes contacting the polishing pad with abrasive particles from the slurry (Specification 8 and Molnar I, col. 23, ll. 5-7). As such, it appears that Molnar's abrasive particles would not materially affect the basic and novel characteristic of the claimed invention (i.e., friction reduction). Therefore, Appellant has not satisfied her burden to prove that abrasive particles "materially affect" the "basic and novel characteristics" of the claimed invention. *De Lajarte*, 337 F.2d at 874, 143 USPQ 258. Accordingly, we construe "consists essentially of" in Appellant's claims as not excluding abrasive particles from the polishing pad.

We are also unpersuaded by Appellant's argument that Molnar I's disclosure at column 29, lines 8-11 to separate the abrasive particles from the lubricant is relevant only to the situation where both the abrasive and lubricant are in the finishing composition (e.g., slurry) (Br. 6). Molnar I begins the paragraph containing the disputed disclosure by stating that the "lubricant can be contained in the finishing element finishing surface [i.e., polishing pad] and then supplied to the interface between the workpiece being finished and the finishing element [i.e., polishing pad] finishing surface by the operative finishing motion" (Molnar I, col. 28, ll. 50-53). Molnar I further states that "[w]hen the lubricant is contained in the finishing element surface the need for lubricants in the finishing composition is reduced or eliminated" (Molnar I, col. 28, ll. 60-62). Molnar I additionally gives an example where, if the lubricants are provided in a first finishing composition free of abrasives and abrasives are supplied in the finishing element (i.e., polishing pad) finishing surface, then the lubricants can be separately and independently controlled from the abrasive (Molnar I,

col. 29, ll. 3-7). Molnar I concludes the passage by making a general statement that “[s]upplying lubricant separately and independently of the abrasive to the operative finishing interface is preferred because this improves finishing control” (Molnar I, col. 29, ll. 8-11).

From these disclosures, we interpret Molnar I’s passage discussed above as stating that the abrasive or lubricant may be contained either in the slurry or the finishing element (i.e., polishing pad) so long as the abrasive and lubricant are separately and independently supplied for improved finishing control. In fact, Molnar I’s example at column 29, lines 3-7 includes an example where the finishing element (i.e., polishing pad) contains the abrasives and the slurry contains the lubricant. Molnar I’s passage further includes an example where the lubricant is contained in the finishing element (i.e., polishing pad) (Molnar I, col. 28, ll. 50-53). Therefore, the Examiner’s position that the lubricant and abrasive are inherently separately supplied such that the lubricant is supplied in the finishing element (i.e., polishing pad) and abrasive is supplied in the slurry is supported by Molnar I’s disclosure.

In any event, in view of our construction of “consists essentially of” noted above, whether the abrasive is separately supplied from the lubricant is not critical to our finding that Molnar I anticipates Appellant’s claimed invention. Rather, because we construe “consists essentially of” in Appellant’s claims such that abrasives do not materially affect the basic and novel characteristics of the claimed invention, Molnar I’s finishing element may contain abrasives in addition to the solid lubricant and still meet Appellant’s claim feature of a polishing pad that “consists essentially of a polymeric matrix and solid lubricant particles.” Therefore, our

determination that the Examiner did not err in his finding that Molnar I anticipates Appellant's claimed invention is supported by our claim construction coupled with Molnar I's disclosure of a method of planarizing by using a finishing element (i.e., polishing pad) containing lubricant (Molnar I, col. 29, ll. 12-23) and applying a finishing composition (e.g., slurry) containing abrasive particles to the surfaces being planarized (Molnar I, col. 23, ll. 5-7).

Furthermore, we are unpersuaded by Appellant's argument that Molnar I discloses both solid and liquid lubricants such that one of ordinary skill in the art would have to "make fortuitous selections among a myriad of possibilities" to arrive at the claimed invention (Br. 7). In fact, Molnar I provides examples where a solid material (i.e., polytetrafluoroethylene in particulate form) is used as the lubricant in the finishing element (i.e., polishing pad) (Molnar I, col. 29, ll. 21-23, 36-47, col. 30, ll. 1-4). Thus, Molnar I expressly teaches using a solid lubricant in a polymer matrix of a finishing element (i.e., polishing pad) such that no "fortuitous selections among a myriad of possibilities" is required. Rather, the claim 17 method would result by following Molnar I's express teachings to use solid lubricant in the finishing element (i.e., polishing pad).

For the foregoing reasons, we affirm the Examiner's § 102(b) rejection of argued claim 17 and non-argued claims 18, 19, 21-23, 28, 33, and 36.

35 U.S.C. § 103(a) REJECTION OVER MOLNAR I IN VIEW OF HORIE  
DEPENDENT CLAIM 24

Claim 24 depends on independent claim 17 and further states that “the amount of solid lubricant particles is about 0.5 to about 30% by weight” (claim 24).

For dependent claim 24, Appellant further argues that Molnar I and Horie are not combinable since Horie “relates to glass grinding sheets from powdery metal compositions and not from polymer compositions” (Br. 8). We cannot agree with Appellant’s argument.

Molnar I discloses a finishing element, which may be constructed of a porous compressible material, for finishing (i.e., grinding) a workpiece such as a glass television faceplate (Molnar I, col. 16, ll. 26-29, col. 22, ll. 51-52). Molnar I further discloses that supplying an effective amount of lubricant reduces the coefficient of friction between the workpiece surface and the finishing element finishing surface such that unwanted surface damage is reduced (Molnar I, col. 23, ll. 52-55). Molnar I discloses adding solid lubricant to the finishing element (Molnar I, col. 26, ll. 52-67; col. 30, ll. 1-4).

Horie discloses a grinding sheet for grinding glass lenses (Horie, col. 1, ll. 11-15). Horie further discloses adding solid lubricant in an amount of 1-5% by weight to the grinding sheet to prevent scratches on the glass during grinding (Horie, col. 3, ll. 60-65; claim 8).

From the above disclosures, Molnar I and Horie are combinable because one of ordinary skill in the art would have looked to Horie’s disclosure to determine a desirable amount of lubricant to add to Molnar I’s

finishing element to prevent scratches (i.e., unwanted surface damage) on the glass.

Furthermore, Molnar I discloses that lubricants should be provided to the fluid in the interface between the workpiece surface being finished and the finishing element finishing surface in an amount of 0.1 to 15% by weight of the total fluid between the interface (Molnar I, col. 28, ll. 5-15). Molnar I further discloses independently controlling the amount of lubricant such that the lubricant may be supplied to the interface from either the slurry or from the finishing element (Molnar I, col. 28, l. 50 to col. 29, l. 11). Horie discloses that the amount of lubricant is such that it is “effective for preventing formation of scratches on glass” (Horie, col. 3, ll. 56-62). Therefore, Molnar I and Horie recognize that the amount of lubricant necessary to achieve proper lubrication at the interface so as prevent damage to the workpiece is a result-effective variable such that it would have been obvious for an artisan with ordinary skill to develop workable or even optimum ranges for such art-recognized, result-effective parameters. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990); *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

For the foregoing reasons, we affirm the Examiner’s § 103(a) rejection of argued claim 24 and non-argued claims 25-26 over Molnar I in view of Horie.

35 U.S.C. § 103(a) REJECTION OVER MOLNAR I IN VIEW OF  
CHIDDICK  
DEPENDENT CLAIM 32

Claim 32 depends upon claim 17 and further recites that the “lubricant particles comprises at least one member selected from the group consisting of a binding agent, coupling agent or adhesive promoter” (claim 32).

For dependent claim 32, Appellant further argues that Molnar I and Chiddick are not combinable since Chiddick does not relate to polymeric compositions (Br. 9). Appellant additionally argues that there is no motivation for “combining Chiddick with Molnar [I]” (Reply Br. 4). We cannot agree with Appellant’s arguments.

Molnar I discloses a finishing element comprising solid lubricant particles for finishing the surface of a semiconductor wafer (Molnar I, col. 22, ll. 22-25; col. 28, ll. 50-67; col. 29, ll. 1-11). Molnar I further discloses that supplying an effective amount of lubricant reduces the coefficient of friction between the workpiece surface and the finishing element finishing surface such that unwanted surface damage is reduced (Molnar I, col. 23, ll. 52-55).

Chiddick discloses a solid lubricant along with a binding agent in water medium (Chiddick, col. 1, ll. 9-13). Chiddick further discloses that the “binding agent . . . helps to bind the lubricant and friction modifier to the . . . surface [of the item being lubricated]” (Chiddick, col. 2, ll. 31-34).

From these disclosures, Molnar I and Chiddick are combinable because one of ordinary skill in the art would have looked to Chiddick’s disclosure to use a binding agent to adhere the lubricant to the surface being treated with Molnar I’s process of finishing to better adhere the lubricant to

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the semiconductor surface being treated so as to avoid unwanted surface damage.

Regarding Appellant's lack of motivation argument, Chiddick provides motivation for combining his binding agent with Molnar I's lubricant used in the finishing process, namely, "to bind the lubricant and friction modifier to the . . . surface" (Chiddick, col. 2, ll. 31-34). Furthermore, a teaching, suggestion, or motivation to combine the relevant prior art teachings does not have to be found explicitly in the prior art, as the teaching, suggestion, or motivation may be implicit from the prior art as a whole. *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006); cited with approval in *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007). Accordingly, we are not persuaded by Appellant's argument.

For the foregoing reasons, we affirm the Examiner's § 103(a) rejection of claim 32 over Molnar I in view of Chiddick.

### 35 U.S.C. § 103(a) REJECTION OVER MOLNAR I IN VIEW OF MOLNAR II

#### CLAIM 34

Claim 34 depends upon independent claim 17 and further recites that "the surface to be polished contains at least one low-k dielectric selected from the group consisting [*sic* of] low-k porous dielectric, low-k non-porous dielectric and air bridges and combinations thereof" (claim 34).

Appellant argues that Molnar II teaches away from the combination with Molnar I because Molnar II “relates specifically to finishing elements and requires the abrasive to be fixed in the finishing element” (Br. 9).

We are not persuaded by Appellant’s argument.

Appellant does not contest the reason provided by the Examiner for combining Molnar II’s low-k porous dielectric with Molnar I’s finishing process. Rather, Appellant makes the same argument she made with respect to claim 17, namely, a pad that includes abrasives is excluded by the language “consists essentially of” in claim 17. We are unpersuaded by this argument regarding claim 17 for the reasons noted above.

Accordingly, we affirm the Examiner’s § 103(a) rejection of argued claim 34 and non-argued claim 35 over Molnar I in view of Molnar II.

#### NON-ARGUED § 103(a) REJECTIONS

Appellant does not argue the following rejections of dependent claims 20, 27, 29, 30, and 31, which all depend on claim 17: (1) the § 103(a) rejection of claim 20 over Molnar I in view of Nishida, (2) the § 103(a) rejection of claim 27 over Molnar I in view of Murata, (3) the § 103(a) rejection of claim 29 over Molnar I in view of Bajaj, and (4) the § 103(a) rejection of claims 30 and 31 over Molnar I in view of Cook. Rather Appellant bases the viability of these rejections on whether the § 102(b) rejection of claim 17 is proper.

Like the Examiner, we find that Molnar I anticipates claim 17 for the reasons indicated above. We affirm each of the following non-argued rejections: (1) the § 103(a) rejection of claim 20 over Molnar I in view of Nishida, (2) the § 103(a) rejection of claim 27 over Molnar I in view of

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Murata, (3) the § 103(a) rejection of claim 29 over Molnar I in view of Bajaj, and (4) the § 103(a) rejection of claims 30 and 31 over Molnar I in view of Cook.

#### DECISION

The Examiner's rejection of claims 17-19, 21-23, 28, 33, and 36 under 35 U.S.C. § 102(b) as being unpatentable over Molnar I is AFFIRMED.

The Examiner's rejection of claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Nishida is AFFIRMED.

The Examiner's rejection of claims 24-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Horie is AFFIRMED.

The Examiner's rejection of claim 27 under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Murata is AFFIRMED.

The Examiner's rejection of claim 29 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Bajaj is AFFIRMED.

The Examiner's rejection of claims 30 and 31 under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Cook is AFFIRMED.

The Examiner's rejection of claim 32 under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Chiddick is AFFIRMED.

The Examiner's rejection of claims 34 and 35 under 35 U.S.C. § 103(a) as being unpatentable over Molnar I in view of Molnar II is AFFIRMED.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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