

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte KANG SUB YIM, SOOVO SEN,
DIAN SUGIARTO, PETER LEE and ELLIE YIEH

Appeal No. 2005-2013
Application No. 10/140,324

ON BRIEF

Before PAK, WATLZ and JEFFREY T. SMITH, Administrative Patent Judges.
JEFFREY T. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 to 9 and 17 to 22, all of the pending claims. We have jurisdiction under 35 U.S.C. § 134.

BACKGROUND

The Appellants' invention relates to a showerhead adapted for distributing gases into a processing chamber and a processing chamber. According to Appellants, the a processing chamber is suitable for chemical vapor deposition utilizing a common process kit for forming various dielectric layers on a substrate. (Brief, pp. 2-3).

Representative claims 1 and 17 are reproduced below:

1. A showerhead for distributing gases in a processing chamber comprising:
a face plate having a plurality of holes formed therethrough, each hole including a restrictive section, a center passage section, and an opening section;
an annular body having a first end coupled to a first side of the face plate;
a mounting flange coupled to a second end of the annular body; and
an annular lip extending from a second side of the face plate opposite the mounting flange and defining a peripheral boundary to a plasma containing region.

17. A processing chamber comprising:
a chamber body;
a lid disposed on the chamber body;
a substrate support disposed in the chamber body;
a face plate having a plurality of at least partially tapered holes formed therethrough, each hole including a restrictive section, a center passage section, and an opening section, the face plate disposed between the lid and the substrate support;
an annular body having a first end coupled to a first side of the face plate;
a mounting flange coupled to a second end of the annular body and coupled to the lid; and
an annular lip extending a second side of the face plate opposite the mounting flange and defining an angle of between about 80 and about 90 degrees relative to the face plate, wherein the lip is adapted at least partially for confining a plasma proximate the face plate, an inner diameter of the lip having a diameter less than a diameter of the substrate support.

CITED PRIOR ART

As evidence of unpatentability, the Examiner relies on the following references:

Hills et al. (Hills)	5,685,914	Nov. 11, 1997
Murakami et al. (Murakami)	5,728,223	Mar. 17, 1998

The Examiner rejected claims 1-9 and 17-22 are rejected under 35 U.S.C. §103(a) as obvious over Hills and Murakami. (Final Rejection, pp. 4-7).

We have carefully reviewed the claims, specification and applied prior art, including all of the arguments advanced by both the Examiner and Appellants in support of their respective positions. This review leads us to conclude that the Examiner's rejection under 35 U.S.C. § 103(a) is not well founded.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and the Appellants regarding the above-noted rejection, we make reference to Appellants' Brief filed August 27, 2004, Reply Brief filed December 28, 2004 and the Examiner's Answer mailed February 11, 2005 and the Final Rejection mailed March 22, 2004.

OPINION

To hold an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the reference teachings and combine them in a way that would produce the claimed invention. See, e.g., *Heidelberger*

Druckmaschinen AG v. Hantscho Commercial Prods., Inc., 21 F.3d 1068, 1072, 30 USPQ2d 1377, 1379 (Fed. Cir. 1994) (When the patent invention is made by combining known components to achieve a new system, the prior art must provide a suggestion, or motivation to make such a combination.); *Northern Telecom v. Datapoint Corp.*, 908 F.2d 931, 934, 15 USPQ2d 1321, 1323 (Fed. Cir. 1990) (It is insufficient to establish a *prima facie* case of obviousness based on prior art references disclosing the components of a patented device, either separately or used in other combinations; there must be some teaching, suggestion, or incentive to make the combination made by the inventor.); *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1044, 1051, 5 USPQ 1434, 1438 (Fed. Cir. 1988).

The independent claims 1, 7 and 17 all require a face plate having a plurality of holes formed there through, each hole including a restrictive section, a center passage section, and an opening section, an annular body having a first end coupled to a first side of the face plate, a mounting flange coupled to a second end of the annular body, and an annular lip extending from a second side of the face plate opposite the mounting flange.

The Examiner asserts that the combination of Hills and Murakami teaches the features of the claimed invention because it is obvious to substitute holes 174 on a gas distribution plate 170 of Hills with holes (29, 21a/21b) of Murakami and add a hatched portion beside a gas injector head 5 in Figure 1 of Murakami to the gas distribution plate 170 of Hills. The Examiner further asserts that the holes (29, 21a/21b) of Murakami

have a restrictive section (21a/21b) and a center passage section (28) and an opening section (27). (Final Rejection, pp. 5-6). The Examiner concludes “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to extend Hills['] annular body to provide a mounting flange as taught by Murakami, including shaping, numbering, and positioning Hills['] holes as taught by Murakami, including optimizing the dimensions of Hills['] apparatus and Hills['] lip face plate angle. . . .” (Final Rejection, p. 7).

The Examiner disagrees with the Appellants position that there is no suggestion to combine the references. Specifically the Examiner states:

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, there is some teaching, suggestion, and motivation to extend Hill's annular body to provide a mounting flange as taught by Murakami, including shaping, numbering, and positioning Hill's holes as taught by Murakami, including optimizing the dimensions of Hill's apparatus and Hill's lip-face plate angle.

Motivation to extend Hill's annular body to provide a mounting flange as taught by Murakami, including shaping, numbering, and positioning Hill's holes as taught by Murakami, including optimizing the dimensions of Hill's apparatus and Hill's lip-face plate angle is for providing support means for Hill's showerhead and sizing his apparatus for the desired wafer size (column 4, line 1 - Hill) and plasma confinement (column 5, lines 31-36 - Hill) while providing for uniform flow of the process gasses as taught by Murakami (column 2, lines 53-59). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art. (Answer, p. 6).

Contrary to the assertion by the Examiner, the combination of Hills et al. and Murakami et al. do not teach, show, or suggest a restrictive section, as recited in claims 1, 7 and 17. As stated by Appellants, Brief pages 5-6:

the holes 21a and 21b in Murakami et al are totally separated from the nozzle 29, not part of the nozzle 29 having a straight passage 28 and a diffuser 27. The gas inlet passages 21a and 21b of Murakami et al. feed into a gas mixing chamber 26, from which the mixed gases feed into a straight passage 28 and then through a diffuser 27 into the reaction chamber 3. The diffusion of the gases is not restrained in any way. There is no face plate or focus ring after the gas mixing chamber in the gas injector lid 5; instead the gas is freely flow into contact with the walls of the reaction chamber 3. Thus, the combination of Hills et al. and Murakami et al. fails to suggest a face plate having a plurality of holes formed therethrough, each hole including a restrictive section, a center passage section, and an opening section.

We further agree with Appellants that “there is no annular body in Murakami et al. and Murakami et al. does not teach, show, or suggest a mounting flange coupled to a second end of an annular body. Thus, there is no suggestion or motivation in the references to include an annular body having a first end coupled to a first side of the face plate and a mounting flange coupled to a second end of the annular body,” as required by the independent claims. (Brief, p. 6). As such, we do not agree with the Examiner's obviousness position as outlined in the Final Rejection. The speculative position asserted by the Examiner is merely an unsupported opinion of the Examiner and such is not enough to establish the obviousness of the claimed subject matter within the meaning of 35 U.S.C. § 103. Rather, as our reviewing court has made clear, the Examiner must identify a particularized suggestion, reason or motivation to combine

references or make the proposed modification in a manner so as to arrive at the claimed invention. See *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998). Any such showing must be clear and particular. See *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). In the present case, sufficient evidence to establish such a suggestion is not made manifest in the Examiner's stated rejection based on the teachings of the applied references. We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of appealed claims 1-9 and 17-22.

Rejections based on § 103(a) must rest on a factual basis with these facts being interpreted without hindsight reconstruction of the invention from the prior art. See *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 177 (CCPA 1967). Our reviewing court has repeatedly cautioned against employing hindsight by using the Appellants' disclosure as a blueprint to reconstruct the claimed invention from the isolated teachings of the prior art. See, e.g., *Grain Processing Corp. v. American Maize-Products Co.*, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988).

From our perspective, the Examiner's rejection appears to be premised on impermissible hindsight reasoning. On the record of this appeal, it is our view that the Examiner has not carried the burden of establishing a *prima facie* case of obviousness with respect to the subject matter defined by the appealed claims.

For the foregoing reasons, we determine that the Examiner's conclusion of obviousness is not supported by facts. Accordingly, the Examiner's rejection of appealed claims are reversed.

REVERSED

CHUNG K. PAK
Administrative Patent Judge

THOMAS A. WALTZ
Administrative Patent Judge

JEFFREY T. SMITH
Administrative Patent Judge

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