

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not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ARDESHIR JEHANGIR SIDHWA

Appeal 2006-1512
Application 10/131,455
Technology Center 1700

Decided: July 31, 2007

Before EDWARD C. KIMLIN, CATHERINE Q. TIMM,
and JEFFREY T. SMITH, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1 and 5-19. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

I. BACKGROUND

The invention relates to a clamp rings for securing substrates to a support member within a deposition chamber. The clamp ring has an edge exclusion lip with a variable bottom surface to a support member within a deposition chamber (Specification 1). Claim 1 is illustrative of the subject matter on appeal:

1. A clamp ring for securing a substrate comprising:

a body;

one or more substrate contacting surfaces projecting from the body; and an edge exclusion lip projecting from the body, the lip sized and adapted to project over an edge of any substrate beneath the one or more contacting surfaces, the lip spaced from the substrate at an innermost edge of the lip by a first distance and spaced from the substrate at the substrate edge by a second distance smaller than the first distance, the lip that having a first bottom surface extending outwardly from the innermost edge of the lip and a second bottom surface projecting inward from the body over the substrate edge,

wherein at least the second distance permits deposition of a layer of pre-selected material to a predefined thickness on each of a predetermined number of substrates secured by the clamp ring without bridging between the substrate and the clamp ring, and

wherein the first bottom surface is sloped from the first distance to the second distance and the second bottom surface is substantially parallel to the substrate.

The Examiner relies on the following prior art references to show unpatentability:

Takashi	JP 09143716 A	Jun. 3, 1997
Stevens	US 5,810,931	Sep. 22, 1998
Lee	US 6,162,336	Dec. 19, 2000

The rejections as presented by the Examiner are as follows:

1. Claims 6 and 7 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite.
2. Claims 6, 7, and 11-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lee.
3. Claims 6, 7, 11-13, and 15-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by Stevens.
4. Claims 14, 18, and 19 stand rejected under 35 U.S.C § 103(a) as unpatentable over Stevens.
5. Claims 1, 8, and 9 stand rejected under 35 U.S.C § 103(a) as unpatentable over Lee in view of Takashi.
6. Claims 5 and 10 stand rejected under 35 U.S.C § 103(a) as unpatentable over Lee and Takashi in view of Stevens.

II. DISCUSSION

A. *Indefiniteness under 35 U.S.C. § 112, ¶ 2*

Claims 6 and 7 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The Examiner contends that the phrase “second distance” is indefinite because this distance is to be selected based upon the material to be deposited on the substrate.

For this ground of rejection, the issue before us is: Is there is a reasonable basis to believe that the ordinary artisan in the art of deposition technology would not be able to determine the scope of the claim? We answer this question in the affirmative.

“The legal standard for definiteness [under the second paragraph of 35 U.S.C. § 112] is whether a claim reasonably apprises those of skill in the art of its scope.” *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The inquiry is to determine whether the claim sets out and circumscribes a particular area with a reasonable degree of precision and particularity. The definiteness of the language employed in a claim must be analyzed not in a vacuum, but in light of the teachings of the particular application. *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). This is especially true in a situation involving a relative claim expression since the Specification must provide some standard for defining or measuring its meaning. *Seattle Box Co. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 826, 221 USPQ 568, 574 (Fed. Cir. 1984).

After consideration of the present record, we determine that a person of ordinary skill in the art would not have recognized the scope of the disputed relative claim language. Appellant has not directed us to specific portions of the Specification, from which a clear meaning of the phrase could be gleaned. That is, we have not been directed to portions of the Specification that provide guidance to determine the “second distance” that is selected based upon the material to be deposited on the substrate. The claimed subject matter is directed to a ring for securing a substrate. The claimed invention does not limit the material that is deposited on the substrate. The Specification does not provide guidance for determining the proper distance for coatings deposited in the chamber.

Appellant contends the claim language does not restrict the selection of the second distance to be based only on the material to be deposited

(Reply Br. 2). The Appellant points to the disclosure of the Specification referencing the deposition of aluminum layers and the deposition of aluminum-copper layers as examples of materials to be deposited (Reply Br. 3-4). The cited portion of the Specification referring to the deposition of aluminum layers is not supportive of Appellant's position because this discussion refers to the prior art (i.e. US 5,810,931). Thus, Appellant has only referred to the deposition of aluminum-copper layers in support of their claimed invention. However, the claimed invention is not limited to the application of aluminum-copper layers. The claimed invention is sufficiently broad to encompass the application of any type of material layer suitable for deposition, such as, copper, aluminum, and titanium-tungsten. The Appellant has not directed us to portions of the Specification that describe the other conditions required for selecting the appropriate distance. That is, Appellant has not identified other characteristics that must be met in order to determine the appropriate "second distance" for a clamp ring designed for deposition of a layer formed from a material other than aluminum-copper.

A person of ordinary skill in the art of deposition technology forming clamp rings would not understand what "second distances" would infringe the claimed invention. *See All Dental Prodx, LLC v. Advantage Dental Products, Inc.*, 309 F.3d 774, 779-80, 64 USPQ2d 1945, 1949 (Fed. Cir. 2002) ("The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, e.g., competitors of the patent owner, can determine

whether or not they infringe.). A person of ordinary skill in the art designing a clamp ring for the deposition of metal films would not appreciate when the claimed invention has been infringed. This is because the Specification describes that the “second distance” is not the same for all types of layers.¹ (See the discussion of aluminum layers versus aluminum-copper layers)

B. Anticipation under 35 U.S.C. § 102(b)

Implicit in our review of the Examiner’s anticipation analysis is that the claim must first have been correctly construed to define the scope and meaning of each contested limitation. See *Gechter v. Davidson*, 116 F.3d 1454, 1457, 43 USPQ2d 1030, 1032 (Fed. Cir. 1997). During prosecution before the Examiner, the claim language should be given its broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account any definitions or enlightenment contained in the written description of Appellant’s Specification. See *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315, 75 USPQ2d 1321, 1327 (Fed. Cir. 2005) (en banc).

Applying the preceding legal principles we determine that the claims on appeal are directed to a clamp ring for securing a substrate comprising a body, one or more substrate contacting surfaces projecting from the body,

¹ It is noted that the Specification describes the invention as solving a need in the art for aluminum-copper alloy deposition (page 4). However the claims are not so limited.

and an edge exclusion lip projecting from the body, the lip sized and adapted to project over an edge of any substrate beneath the one or more contacting surfaces, the lip spaced from the substrate at an innermost edge of the lip by a first distance and spaced from the substrate at the substrate edge by a second distance smaller than the first distance.

We will treat the claim language appearing in the last stanza of claims 6, 7, and 11 beginning with the word “wherein” as equivalent to a process limitation. The limitation describes a process parameter that must be considered in determining the “second distance” (or the second lower surface of claim 11)². Thus, a clamp ring product that comprises the elements discussed above would render the claimed invention unpatentable. It has long been held that “[i]f the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *SmithKline Beecham Corp. v. Apotex Corp.*, 439 F.3d 1312, 1317, 78 USPQ2d 1097, 1101 (Fed. Cir. 2006) (quoting *In re Thorpe*, 777 F.2d 695, [697], 227 USPQ 964, 966 (Fed. Cir. 1985)).

Claims 6, 7, and 11-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lee.

² The subject matter of claim 11 is directed to a clamp ring comprising a roof having upper and lower surfaces, at least one substrate contacting surface extending downwardly from the lower roof surface, and a lip forming an inner terminus of the roof, wherein the lip is sized and adapted to extend inwardly over the edge of the substrate while remaining vertically spaced from the substrate, the lip having a variable lower surface comprising at least first and second lower surfaces, the first surface disposed inwardly from the second surface.

A claimed invention is anticipated under 35 U.S.C. § 102 when all of the elements of the claimed invention are found in one reference. See *Scripps Clinic & Research Found. V. Genentech Inc.*, 927 F.2d 1565, 1576, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991). The prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently. *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1433 (Fed. Cir. 1997).

The issue presented for review with respect to this rejection is: Does the Lee reference have a disclosure that anticipates the claimed subject matter? The issue turns on whether Lee describes a clamp ring for securing a substrate comprising a body, one or more substrate contacting surfaces projecting from the body, and an edge exclusion lip projecting from the body, the lip sized and adapted to project over an edge of any substrate beneath the one or more contacting surfaces, the lip spaced from the substrate at an innermost edge of the lip by a first distance and spaced from the substrate at the substrate edge by a second distance smaller than the first distance. We answer this question in the affirmative.

The Examiner finds that Lee describes a clamp ring that comprises all of the above components (Answer 3-4).

Appellant has not disputed the Examiner's findings. Rather, Appellant contends that the limitation appearing in the last stanza of claim 6 and 7 is not described in Lee (Br. 8-9). Appellant's contention is not persuasive for the reasons set forth above. It has not been disputed that Lee describes a clamp ring that comprises all of the above structural components. Appellant

has not directed us to evidence that establishes that the clamp ring described by Lee is patentably distinct from the claimed invention.

Regarding claims 11-17, Appellant has not argued that Lee does not disclose a clamp ring comprising a roof having upper and lower surfaces, at least one substrate contacting surface extending downwardly from the lower roof surface, and a lip forming an inner terminus of the roof. Appellant also has not argued that the lip of Lee is sized and adapted to extend inwardly over the edge of the substrate while remaining vertically spaced from the substrate or that the lip has a variable lower surface comprising at least first and second lower surfaces wherein the first surface is disposed inwardly from the second surface. Rather, Appellant contends that the limitation appearing in the last stanza of claim 11 is not described in Lee (Br. 12-13).³ Appellant's arguments are not persuasive of patentability. We agree with the Examiner that the clamp ring is designed to reduce the probability of sticking and bridging (accumulation of the positive material) between the substrate and the clamp ring (Answer 8). Appellant has not directed us to evidence that establishes that the clamp ring described by Lee is patentably distinct from the claimed invention.

Claims 6, 7, 11-13, and 15-17 stand rejected under 35 U.S.C. § 102(b) as anticipated by Stevens.

The issue presented for review with respect to this rejection is: Does the Stevens reference have a disclosure that anticipates the claimed subject matter? The issue turns on whether Stevens describes a clamp ring for

³ Appellant has grouped the arguments for these claims together (Br. 12-13). Therefore, we will limit our consideration to claim 11.

securing a substrate comprising a body, one or more substrate contacting surfaces projecting from the body, and an edge exclusion lip projecting from the body, the lip sized and adapted to project over an edge of any substrate beneath the one or more contacting surfaces, the lip spaced from the substrate at an innermost edge of the lip by a first distance and spaced from the substrate at the substrate edge by a second distance smaller than the first distance. We answer this question in the affirmative.

The Examiner finds that Stevens describes a clamp ring that comprises all of the above components (Answer 6).

Appellant has not disputed the Examiner's findings. Appellant's arguments for this rejection are substantially the same as those presented for the discussion of claims 6 and 7 in the rejection over Lee discussed above. Specifically, Appellant contends that Stevens does not teach that the height of the first stepped surface closest of the substrate edge is selected based on the material to be deposited (Br. 10). Appellant's arguments are not persuasive. This argument is directed to the process limitation described in the last stanza of the claim. Appellant has not directed us to evidence that establishes that the clamp ring described by Stevens is patentably distinct from the claimed invention.

Regarding claims 11-13, and 15-17, Appellant has not argued that Stevens does not disclose to a clamp ring comprising a roof having upper and lower surfaces, at least one substrate contacting surface extending downwardly from the lower roof surface, and a lip forming an inner terminus of the roof. Appellant also has not argued that the lip of Stevens is sized and adapted to extend inwardly over the edge of the substrate while

remaining vertically spaced from the substrate or that the lip has a variable lower surface comprising at least first and second lower surfaces wherein the first surface is disposed inwardly from the second surface. Rather, Appellant contends that the limitation appearing in the last stanza of claim 11 is not described in Stevens (Br. 14-15).⁴ Appellant's arguments are not persuasive of patentability. We agree with the Examiner that the clamp ring is designed to reduce the probability of sticking and bridging (accumulation of the positive material) between the substrate and the clamp ring (Answer 8). Appellant has not directed us to evidence that establishes that the clamp ring described by Stevens is patentably distinct from the claimed invention.

C. The Obviousness Rejections

Claims 14, 18, and 19 stand rejected under 35 U.S.C § 103(a) as unpatentable over Stevens.

Appellant argues that Stevens does not disclose that the height of the first stepped surface, closest to the substrate, is selected to minimize accumulation of deposited materials on the side wall adjacent to the first stepped surface. This is the same argument that was presented for claim 11 (*See* Brief 17). Appellant's argument is not persuasive for the reasons set forth above. Furthermore, Appellant's argument does not address the Examiner's basis of rejecting the claims. Specifically, Appellant has not addressed the Examiner's position that the selection of the aspect ratios of the roof surfaces was determined to minimize sticking due to the accumulation of deposited materials.

⁴ Appellant has grouped the arguments for these claims together (Br. 14-15). Therefore, we will limit our consideration to claim 11.

Claims 1, 8, and 9 stand rejected under 35 U.S.C § 103(a) as unpatentable over Lee in view of Takashi; and Claims 5 and 10 are rejected under 35 U.S.C § 103(a) as unpatentable over Lee and Takashi in view of Stevens.

Appellant has grouped the arguments for these rejections together. (*See* Brief 20). Appellant has not presented separate arguments directed to the individual claims within these rejections. We select claim 1 as representative.

Appellant contends that the combination of Lee and Takashi or the combination of Lee Takashi and Stevens does not teach or suggest an edge exclusion lip having at least a portion of a bottom surface slope from a first height to a second height smaller than the first height as specified in the claimed invention (Br. 20). Appellant further contends that the chamfered part of Takashi does not teach or suggest a surface slope from the first height to a second height (Br. 20).

Appellant's contentions are not persuasive. The Examiner cites Takashi for teaching that it was obvious to slope the bottom surface of the clamp ring to reduce stress on the film to prevent peeling and possible contamination of the deposited film (Answer 5). As such a person of ordinary skill in the art would have reasonably expected that the clamp ring of Lee could include a slope from the first bottom surface to the second bottom surface with the expectation of gaining the advantages described by Takashi.

As a final point, we note that Appellant's has not relied upon evidence of unexpected results in response to the Examiner's obviousness rejections.

III. DECISION

The rejection of claims 6 and 7 under 35 U.S.C. § 112, second paragraph, is affirmed. The prior art rejections of claims 1, and 5-19 are affirmed.

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

AFFIRMED

tf/lr

Lisa K. Jorgenson
STMicroelectronics, Inc.
1310 Electronics Drive
Carrollton, TX 75006