UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YOSHIAKI TANASE, BILLY C. LEUNG,
GREGORY S. LEWIS, and DAVID E. BERKSTRESSER

Appeal 2008-3746
Application 10/867,100
Technology Center 3700

Decided: December 30, 2008

Before JENNIFER D. BAHR, LINDA E. HORNER, and MICHAEL W. O'NEILL, *Administrative Patent Judges*.

O'NEILL, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Yoshiaki Tanase et al. (Appellants) seek our review under 35 U.S.C. § 134 of the final rejection of claims 1-9, 11-13, 18-21, 23-25, 28, 30-32, 40-45, and 48-54. Claims 26, 27, and 29 are objected to as being dependent upon a rejected base claim and are not before us for review. The Examiner

indicates claims 46, 47, and 55-58 are allowable. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

SUMMARY OF DECISION

We AFFIRM-IN-PART.

THE INVENTION

The claimed invention is to an apparatus for sealing a substrate transfer passage in a vacuum chamber.

Claims 1, 9, and 40, reproduced below, are representative of the subject matter on appeal.

> 1. Apparatus for sealing a substrate transfer passage in a vacuum chamber, comprising:
>
> an elongated door member having a convex sealing face configured for sealing the substrate transfer passage of the vacuum chamber; and
>
> an actuator assembly configured to flatten the convex sealing face of the elongated door member against the substrate transfer passage.
>
> 9. A vacuum chamber having an apparatus for sealing a substrate transfer passage, comprising:
>
> a chamber body having a first interior volume;
>
> a flat sealing surface surrounding a first substrate transfer port defined through the chamber body and configured to allow passage of a large area substrate therethrough; and
>
> a door member having a convex sealing face relative to the flat sealing surface, wherein the door member is moveable between a first position that covers the first substrate transfer port and a second position clear of the first substrate transfer port.

40. A vacuum chamber having an apparatus for sealing a substrate transfer passage, comprising:

a vacuum chamber body having first interior volume and a flat sealing surface surrounding a first substrate transfer port defined through the chamber body and configured to allow passage of a large area substrate therethrough;

a flexible door member having a convex sealing face movable between a first position that covers the first substrate transfer port and a second position clear of the first substrate transfer port; and

two mounting assemblies coupled to opposite ends of a backside of the flexible door member.

THE PRIOR ART

The Examiner relies upon the following as evidence of unpatentability:

Giwosky	US 3,557,837	Jan. 26, 1971
Freerks	US 6,089,543	Jul. 18, 2000
Kroeker	US 6,250,869 B1	Jun. 26, 2001

Appellants' admitted prior art in figures 1A and 1B ("AAPA").

THE REJECTIONS

The following Examiner's rejections are before us for review:

1. Claims 1-9, 11-13, 19-21, 23-25, 28, 31, 32, 40-42, 44, 45, 48-50, 52 and 54 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kroeker.

2. Claims 1, 2, 5, 8, 9, 13, 40, 49, 50, 52, and 54 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Giwosky.

3. Claims 18, 43, and 51 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Giwosky, as applied to claims 9, 40, and 9, respectively, and further with engineering expedience.

4. Claims 18, 30, 43, 51, and 53 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kroeker.

5. Claims 19, 20, 21, 25, 31, 32, 44, and 45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Giwosky as applied to claims 9 and 40, and further with Kroeker.

6. Claim 30 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of Giwosky, Kroeker, and further with engineering expedience.

7. Claim 48 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Giwosky as applied to claim 1 above, and further with Freerks.

ISSUES

The Appellants contend the Examiner erred in rejecting the claims because Kroeker fails to describe flattening the convex sealing face, as recited in claim 1 (App. Br. 10 and Reply Br. 3-4). The Examiner found Kroeker describes a convex sealing face that engages a transfer chamber's surface wherein contact with that surface would cause the sealing face to flatten. (Ans. 3 and 9.)

The first issue before us is:

Have the Appellants shown that the Examiner erred in finding that Kroeker describes flattening a convex sealing face of a door?

The Appellants further contend the Examiner erred in rejecting the claims, because Kroeker fails to describe a door member having a convex sealing face relative to a flat sealing surface surrounding a substrate transfer port, as set forth in claims 9 and 40. (App. Br. 10 and Reply Br. 3-4.) The Examiner found Kroeker discloses a cross-sectional view of the transfer chamber that shows the surface as sufficiently flat to meet the claim limitation of "flat sealing surface surrounding a first substrate transfer port" as claimed in claims 9 and 40. (Ans. 9.)

The second issue before us is:

Have the Appellants shown that the Examiner erred in finding that Kroeker describes a flat sealing surface surrounding a substrate transfer port?

The Appellants further contend the Examiner erred in asserting that Giwosky teaches a convex sealing face, with respect to a transfer passage, configured to be flattened in order to more effectively seal the transfer passage. (Reply Br. 5.) The Examiner concluded that it would have been obvious to modify the AAPA door assembly to have a convex sealing face based on the teachings of Giwosky. (Ans. 4 and 9.)

The third issue before us is:

Have the Appellants shown the Examiner erred in concluding it would have been obvious to modify the AAPA's door, shown in Figures 1A and 1B, to have a convex sealing face based on the teachings of Giwosky?

FINDINGS OF FACT

We find that the following enumerated findings of fact are supported by at least a preponderance of the evidence. *Ethicon, Inc. v. Quigg*, 849

F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Office).

1. Appellants' Admitted Prior Art (AAPA) shows a flat door sealing a substrate transfer port. (Specification, Figures 1A and 1B.)
2. Flatten means to become or to make flatter. *Webster's Ninth New Collegiate Dictionary* 471 (1987).
3. Kroeker describes an apparatus for sealing a substrate transfer passage in a vacuum chamber.
4. As shown in Figure 5, the surface 88 and the first openings 58 and 44 permit the first substrate cassette holder to transfer substrates from load lock housing 56 to central chamber 50. (Kroeker, col. 5, ll. 9-12 and Figure 5.) As such, the combination of the surface 88 and the openings 58 and 44 can be characterized as a substrate transfer passage.
5. As shown in Figures 6, 10-13, and 15, Kroeker describes an elongated convex door member 72 with seals 84, 86. Seals 84, 86 follow the contour of the door 72. The seals are configured to seal the surface 88, which is part of the substrate transfer passage. Surface 88 is convex in shape. An actuator assembly 74, 75, 76, 82 rotates (see the arrows in Figures 10-12) the door 72 and pushes (see arrows in Figure 12) the door 72 outward to contact the surface 88. When seals 84, 86 engage surface 88, first load lock housing 56 is sealed from the central chamber 50. The seals 84, 86 are made from elastomers. (Kroeker, col. 6, l. 24 to col. 7, l. 17.)
6. Because the seals are configured to seal the surface 88 (thus sealing housing 56 from chamber 50) and follow the contour of the door 72,

the seals 84, 86 present a convex sealing face to match the convex shape of the surface 88. Because the seals 84, 86 are made from elastomers, the seals 84, 86 are flattened, i.e. become flatter, against the surface 88 when the actuator assembly 74, 75, 76, 82 pushes the door 72 toward the surface 88 (see Figure 12). As such, the seals 84, 86 are presenting a convex sealing face to the surface 88 and the actuator assembly 74, 75, 76, 82 is flattening the convex sealing face (seals 84, 86) of the door 72 against the surface 88 (which is part of the substrate transfer passage).

7. Giwosky describes a resilient seal facing a transfer passage (conduit 32). The seal 20 is between the transfer passage and door 10. The seal is dished shaped and its concave portion faces the transfer passage (see Figure 1). The seal has slots 26. The purpose of slots 26 is to permit gas to flow as the door 10 is moved from fully open to just sealing the transfer passage, thus permitting a gradual throttling of the gas flow. If the seal 20 were flipped so that the convex portion of the seal faced the transfer passage, then it is not clear to us that the seal would permit the gradual throttling of gas flow through the valve as taught by Giwosky. As such, the seal would not operate as Giwosky intended to "tailor" the flow characteristics of the transfer chamber. (Giwosky, col. 1, l. 15 to col. 2, l. 14.)
8. The Examiner relied on Freerks only to teach making the door from aluminum. (Ans. 8.)

PRINCIPLES OF LAW

Anticipation

Anticipation is a question of fact. *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). Anticipation is determined by first construing the claims and then comparing the properly construed claims to the prior art. *In re Cruciferous Sprout Litigation*, 301 F.3d 1343, 1346 (Fed. Cir. 2002). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). However,

> [t]he law of anticipation does not require that the reference 'teach' what the subject patent teaches. Assuming that a reference is properly 'prior art,' it is only necessary that the claims under attack, as construed by the court, 'read on' something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or 'fully met' by it.

Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 772 (Fed. Cir. 1983).

Obviousness

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. *See In re Rijckaert*, 9 F.3d 1531, 1532 (Fed. Cir. 1993). Appellants have the burden on appeal to the Board to demonstrate error in the Examiner's position. *See In re Kahn*, 441 F.3d 977, 985-86 (Fed. Cir. 2006).

ANALYSIS

Section 102(b) Rejection of claims 1-9, 11-13, 19-21, 23-25, 28, 31, 32, 40-42, 44, 45, 48-50, 52, and 54 with Kroeker

Claim 1

The Appellants argue claims 1-8, 48, 49, and 54 as a group. We select claim 1 as the representative claim, and claims 2-8, 48, 49, and 54 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2007).

Claim 1 requires only that the actuator assembly "flatten" (make flatter (see Fact 2)) the door's convex sealing face against the substrate transfer passage. Kroeker describes an apparatus for sealing a substrate transfer passage in a vacuum chamber. (Fact 3.) Because the surface 88 and the first openings 58 and 44 permit the first substrate cassette holder to transfer substrates from load lock housing 56 to central chamber 50, the combination of the surface 88 and the openings 58 and 44 can be characterized as a substrate transfer passage. (Fact 4.) Kroeker describes an elongated convex door member 72 with seals 84, 86 and the seals 84, 86 follow the contour of the door 72. The seals are configured to seal the surface 88, which is part of the substrate transfer passage. Surface 88 is convex in shape. An actuator assembly 74, 75, 76, 82 rotates and pushes the door 72 outward to contact the surface 88. When seals 84, 86 engage surface 88, first load lock housing 56 is sealed from the central chamber 50. The seals 84, 86 are made from elastomers. (see Fact 5.) Because the seals are configured to seal the surface 88 (thus sealing housing 56 from chamber 50) and follow the contour of the door 72, the seals 84, 86 present a convex sealing face to match the convex shape of the surface 88. Because the seals 84, 86 are made from elastomers, the seals 84, 86 are flattened against the

surface 88 when the actuator assembly 74, 75, 76, 82 pushes the door 72 toward the surface 88. As such, the seals 84, 86 are presenting a convex sealing face to the surface 88 and the actuator assembly 74, 75, 76, 82 is flattening, i.e. making flatter, the convex sealing face (seals 84, 86) of the door 72 against the surface 88 (which is part of the substrate transfer passage). (see Fact 6.) Therefore, Kroeker describes an actuator assembly configured to flatten a convex sealing face of a door against a substrate transfer passage.

Claims 9, 11-13, 19-21, 23-25, 28, 40-42, 44, 45, and 50-52

Independent claims 9 and 40 and their dependent claims require the sealing surface to be flat. Contrary to the Examiner's finding that Kroeker's surface 88 is flat based on viewing Kroeker's figures, Kroeker's surface 88 is convex in shape (Fact 5). Therefore, Kroeker does not describe a flat sealing surface surrounding a substrate transfer port.

Section 103(a) Rejection of claims 1, 2, 5, 8, 9, 13, 40, 49, 50, 52, and 54 with Appellants' admitted prior art (AAPA) in Figs. 1A & 1B and Giwosky

The Appellants have argued to invert Giwosky's seal would prevent Giwosky's intended use of regulating the gas flow as the valve closes. (Reply Br. 5.) In our view, one of ordinary skill in the art would not flip Giwosky's seal and then apply that flipped seal to the AAPA's door as the Examiner asserts because flipping Giwosky's seal would make the seal ineffective in regulating the gas flow. If the Giwosky seal were flipped, then to us it is not clear that the seal would permit the gradual throttling of gas flow through the valve, thereby making the Giwosky seal ineffective in regulating the gas flow as taught by Giwosky. (Fact 7.) As such, the

Appellants have shown that the Examiner erred in concluding it would have been obvious to modify the AAPA's door, shown in Figures 1A and 1B, to have a convex sealing face based on the teachings of Giwosky.

Section 103(a) Rejections of claims 18, 43, and 51 with AAPA, Giwosky, and engineering expedience, claims 18, 30, 43, 51, and 53 with Kroeker, claims 19, 20, 21, 25, 31, 32, 44, and 45 with AAPA, Giwosky, and Kroeker, and claim 30 with AAPA, Giwosky, Kroeker, and engineering expedience

Claims 18-21, 25, 30, 31, 32, 43-45, 51, and 53 depend from either claim 9 or claim 40. The rejections of these claims are grounded in part on the Examiner's flawed finding that Kroeker's surface 88 is flat based on viewing Kroeker's figures, Kroeker's surface 88 is convex in shape. Accordingly, these rejections are improper for the reason discussed above with respect to claims 9 and 40.

Section 103(a) Rejection of claim 48 with AAPA, Giwosky, and Freerks

The Examiner does not rely on Freerks to cure the above-noted deficiencies of the AAPA and Giwosky (see Fact 8), and thus, the rejection of claim 48 with AAPA, Giwosky, and Freerks is likewise improper for the same reasons provided in the analysis of the rejection of claim 1 with AAPA and Giwosky.

CONCLUSIONS

Kroeker describes flattening a convex sealing face of a door and does not describe a flat sealing surface surrounding a substrate transfer port.

The Examiner erred in concluding it would have been obvious to modify the AAPA's door, shown in Figures 1A and 1B, to have a convex sealing face based on the teachings of Giwosky.

DECISION

1. The Examiner's decision to reject claims 1-8, 48, 49, and 54 under 35 U.S.C. § 102(b) as being anticipated by Kroeker is affirmed. The Examiner's decision to reject claims 9, 11-13, 19-21, 23-25, 28, 31, 32, 40-42, 45, 50, and 52 under 35 U.S.C. § 102(b) as being anticipated by Kroeker is reversed.

2. The Examiner's decision to reject claims 1, 2, 5, 8, 9, 13, 40, 49, 50, 52, and 54 under 35 U.S.C. § 103(a) as being unpatentable over AAPA and Giwosky is reversed.

3. The Examiner's decision to reject claims 18, 43, and 51 under 35 U.S.C. § 103(a) as being unpatentable over AAPA, Giwosky, and engineering expedience is reversed.

4. The Examiner's decision to reject claims 18, 30, 43, 51, and 53 under 35 U.S.C. § 103(a) as being unpatentable over Kroeker is reversed.

5. The Examiner's decision to reject claims 19, 20, 21, 25, 31, 32, 44, and 45 under 35 U.S.C. § 103(a) as being unpatentable over AAPA, Giwosky, and Kroeker is reversed.

6. The Examiner's decision to reject claim 30 under 35 U.S.C. § 103(a) as being unpatentable over AAPA , Giwosky, Kroeker, and engineering expedience is reversed.

7. The Examiner's decision to reject claim 48 under 35 U.S.C. § 103(a) as being unpatentable over AAPA, Giwosky, and Freerks is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED-IN-PART

LV:

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