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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FRANK MICELI, JOSE OMAR RODRIQUEZ,
ANDRES B. GARCIA, and CHARLES A. STOREY

Appeal 2010-009242
Application 11/237,569
Technology Center 2800

Before MICHAEL R. ZECHER, GLENN J. PERRY, and
JENNIFER S. BISK, *Administrative Patent Judges*.

ZECHER, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-4, 8, and 9. App. Br. 3. Claims 5-7 have been cancelled. *Id.* We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

Appellants' Invention

Appellants invented a method of manufacturing an integrated circuit that includes exposing a wafer to an energy source, defining a focal plane with a depth of focus associated therewith, and conforming the wafer to correspond with the focal plane. Abstract.

Illustrative Claim

Independent claim 1 is illustrative:

1. A method of manufacturing an integrated circuit, the method comprising:

a) positioning a wafer on at least one ring located on a wafer translation stage to receive high frequency energy defining a focal plane having an associated curvature and depth of focus, the at least one ring having a diameter less than that of the wafer and a height such that a space is located between the wafer and the wafer translation stage and into which a portion of the wafer may extend; and

b) bending the wafer such that a portion of the wafer extends into the space and a surface of the wafer generally matches the focal plane/curvature.

Prior Art Relied Upon

La Fiandra	US 4,425,038	Jan. 10, 1984
Stagaman	US 5,563,684	Oct. 8, 1996
Sakakibara	US 6,072,561	June 6, 2000

Rejections on Appeal

Claims 1, 4, 8, and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Stagaman and La Fiandra. Ans. 4-7.

Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Stagaman, La Fiandra, and Sakakibara. *Id.* at 7-8.

Examiner's Findings and Conclusions

The Examiner finds that La Fiandra discloses a plate ring configuration that compresses and deforms a wafer. Ans. 5 and 9. In particular, the Examiner finds that Figure 1 of La Fiandra illustrates a pressure system, *i.e.*, the vacuum 26 and air pressure 38, which compresses and deflects O rings 20, 21, 28, and 34 while the wafer 10 remains in contact with platen 12, *i.e.*, the wafer translation stage, due to the pull of the vacuum 26. *Id.* According to the Examiner, the resulting force on the wafer 10 causes it to bend against the compressed O rings 20, 21, 28, and 34, thereby extending the wafer 10 into spaces 19 and 22, as required by independent claim 1. *Id.* at 9. Further, the Examiner concludes that one with ordinary skill in the art at the time of the claimed invention would have been able to substitute Stagaman's adjustable pin system with La Fiandra's plate ring configuration in order to provide a pressure sufficiently high to produce strain and deform the wafer until proper geometry of the wafer is achieved. Ans. 5 (citing to La Fiandra col. 1, ll. 58-63); *see also* Ans. 8-9 and 12.

Appellants' Contentions

Appellants contend that based on the relative size comparison of the openings 19 and vacuum channels 22 illustrated in Figure 1 of La Fiandra, the wafer 10 cannot extend into either the openings 19 or the vacuum

channels 22 when the vacuum 26 pulls on the wafer 10. App. Br. 6-7; Reply Br. 4. Therefore, Appellants assert that the combination of Stagaman and La Fiandra does not teach bending the wafer such that it extends into the space between the wafer and the wafer translation stage, as required by independent claim 1. App. Br. 7-8; Reply Br. 4. Further, Appellants argue that the Examiner does not provide a sufficient rationale for combining Stagaman and La Fiandra. App. Br. 10-11; Reply Br. 2-4.

II. ISSUE

Has the Examiner erred in determining that the combination of Stagaman and La Fiandra renders independent claim 1 unpatentable? In particular, this issue turns on whether:

(a) the combination of Stagaman and La Fiandra collectively teaches “bending the wafer such that a portion of the wafer extends into the space [located between the wafer and the wafer translation stage][.]” as recited in independent claim 1; and

(b) the Examiner provides an articulated reason with a rationale underpinning to justify the legal conclusion of obviousness.

III. ANALYSIS

35 U.S.C. § 103(a) Rejection—Combination of Stagaman and La Fiandra Claim 1

Based on the record before us, we do not discern error in the Examiner’s obviousness rejection of independent claim 1, which recites, *inter alia*, “bending the wafer such that a portion of the wafer extends into the space [located between the wafer and the wafer translation stage][.]”

The Examiner takes the position that Figures 1 and 2 of La Fiandra illustrate a plate ring configuration that compresses and deforms a wafer. Ans. 5 (citing to col. 2, ll. 31-50); *see also* Ans. 9. For convenience, Figure 1 of La Fiandra is reproduced below:

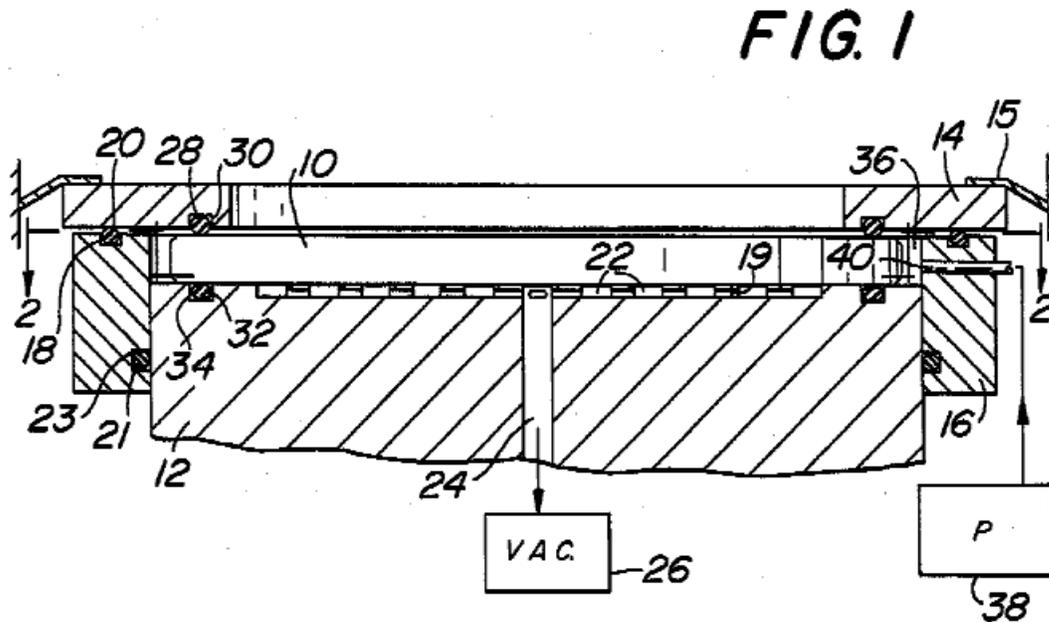


Figure 1 of La Fiandra illustrates an apparatus with a movable platen 12 that holds a wafer 10. Col. 2, ll. 18-21. The surface of the platen 12 consist of vacuum grooves 22, interconnected by openings 19, all of which are connected through an opening 24 to vacuum 26. *Id.* at ll. 31-34. In addition, La Fiandra discloses that flexible O rings 20, 21, 28, and 34 provide a seal that is in close proximity to the edge of the wafer 10. *Id.* at ll. 38-44. As a result of the sealing provided by the flexible O rings 20, 21, 28, and 34, La Fiandra provides a sealed pressure chamber 36 around the outer edge of the wafer 10. *Id.* at ll. 45-47. La Fiandra discloses that an air pressure source 38 is connected to the chamber 36 through opening 40 such that air pressure may be applied to the edge of the wafer 10 to produce a compressive strain thereon. *Id.* at ll. 51-54. La Fiandra discloses achieving

different deformations of the wafer 10 by varying the air pressure applied to the edge of the wafer 10. *Id.* at ll. 58-66.

Based on La Fiandra's Figure 1 and the corresponding text, the Examiner finds that the resulting force on La Fiandra's wafer 10 causes it to bend against the compressed O rings 20, 21, 28, and 34, thereby extending the wafer 10 into spaces 19 and 22. Ans. 9. We agree with the Examiner. Because the wafer 10 may be deformed, *e.g.*, bent, by varying the air pressure applied to the edge of the wafer 10 (col. 2, ll. 58-66), one with ordinary skill in the art would have recognized that individual portions of La Fiandra's wafer 10 may extend into the spaces located in openings 19 and vacuum grooves 22. Contrary to Appellants' argument (App. Br. 6-8; Reply Br. 4), there is nothing in La Fiandra's disclosure indicating that the relative size of the openings 19 and vacuum grooves 22 makes it impossible for individual portions of the wafer 10 to physically extend into those spaces when the appropriate amount of air pressure is applied to the edge of the wafer 10. As such, the Examiner has presented sufficient evidence to warrant a finding that La Fiandra teaches the disputed claim limitation.

Rationale to Combine

We are not persuaded by Appellants' argument that the Examiner does not provide a sufficient rationale for combining Stagaman and La Fiandra. App. Br. 10-11; Reply Br. 2-4. The U.S. Supreme Court has held that "[t]he obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007). Instead, the relevant inquiry is whether the Examiner has set forth

“some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited with approval in *KSR*, 550 U.S. at 418). In addition, the Court instructs that the simple substitution of one known element for another is likely to be obvious if it does no more than yield predictable results. *See KSR*, 550 U.S. at 417.

Upon reviewing the record before us, we find that the Examiner’s suggestion for modifying Stagaman with La Fiandra suffices as an articulated reason with a rational underpinning to justify the legal conclusion of obviousness. That is, one with ordinary skill in the art of integrated circuits, at the time of the claimed invention, would have substituted Stagaman’s adjustable pin system (fig. 3) with La Fiandra’s plate ring configuration (fig. 1) in order to provide a pressure sufficiently high to produce a compressive strain and deform the wafer until proper geometry of the wafer is achieved. Ans. 5 (citing to La Fiandra col. 1, ll. 58-63); *see also* Ans. 8-9 and 12. In addition, the mere substitution of La Fiandra’s plate ring configuration for Stagaman’s adjustable pin system predictably uses prior art elements according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417. Moreover, Appellants have not provided any evidence that such a substitution is beyond the level of an ordinarily skilled artisan. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). It follows that the Examiner has not erred in concluding that the combination of Stagaman and La Fiandra renders independent claim 1 unpatentable.

Claim 4

Appellants present essentially the same argument set forth in response to the obviousness rejection of independent claim 1 to rebut the obviousness rejection of dependent claim 4. App. Br. 8-9. We have already addressed that argument in our discussion of independent claim 1, and we found it unpersuasive. It follows that the Examiner did not err in concluding that the combination of Stagaman and La Fiandra renders dependent claim 4 unpatentable.

Claim 8

The Examiner finds that La Fiandra's vacuum process constitutes "bending [that] includes using a vacuum to pull a portion of the wafer into the space to thereby conform a surface of the wafer[,]" as recited in dependent claim 8. Ans. 10-11. In particular, the Examiner finds that as the air pressure provides a compressive strain on La Fiandra's wafer and, as a result, compresses the O rings, the vacuum ensures that the wafer bends by pulling the wafer into the space left void as a result of the compression. *Id.* at 10. Put another way, the Examiner finds that without La Fiandra's vacuum, there is no control over the direction of the wafer conformation. *Id.*

Appellants contend that the combination of Stagaman and La Fiandra does not teach the elements recited in dependent claim 8. App. Br. 9. In particular, Appellants contend that while La Fiandra's vacuum holds the wafer in place, the purpose of the vacuum is not to bend the wafer into a space located between the wafer and the translation stage. *Id.* Appellants maintain that it is not physically possible for La Fiandra's wafer to bend into

the openings 19 and vacuum channels 22. *Id.* We do not agree with Appellants.

As discussed above, because La Fiandra's wafer 10 may be deformed, *e.g.*, bent, by varying the air pressure applied to the edge of the wafer 10 (col. 2, ll. 58-66), one with ordinary skill in the art would have recognized that individual portions of the wafer 10 may extend into the spaces located in the openings 19 and vacuum grooves 22. Moreover, Appellants agree that La Fiandra's vacuum uses pressure to hold the wafer 10 on the surface of the platen 12. App. Br. 9 (citing to col. 2, ll. 31-37). Given that cited disclosure, one with ordinary skill in the art would have understood that the pressure applied from La Fiandra's vacuum bends or conforms the surface of the wafer 10 by pulling individual portions of the wafer 10 into the spaces located in the openings 19 and vacuum grooves 22. Therefore, we agree with the Examiner that La Fiandra teaches the disputed claim limitation. Ans. 10-11. It follows that the Examiner has not erred in concluding that the combination of Stagaman and La Fiandra renders dependent claim 8 unpatentable.

Claim 9

Appellants do not provide separate and distinct arguments for patentability with respect to dependent claim 9. *See* App. Br. 6-8; Reply Br. 2-4. Therefore, we group dependent claim 9 with its underlying base claim. *See* 37 C.F.R. § 41.37(c)(1)(vii). Consequently, dependent claim 9 falls with independent claim 1.

35 U.S.C. § 103(a) Rejection—Combination of Stagaman, La Fiandra, and Sakakibara

Claims 2 and 3

Appellants contend that Sakakibara does not cure the above-noted deficiencies in the Examiner's combination of Stagaman and La Fiandra. App. Br. 10-11. As discussed above, there are no such deficiencies in the combination of Stagaman and La Fiandra for Sakakibara to remedy. It follows that the Examiner has not erred in concluding that the combination of Stagaman, La Fiandra, and Sakakibara renders dependent claims 2 and 3 unpatentable.

IV. CONCLUSION

For the foregoing reasons, the Examiner has not erred in rejecting claims 1-4, 8, and 9 as being unpatentable under 35 U.S.C. § 103(a).

V. DECISION

We affirm the Examiner's decision to reject claims 1-4, 8, and 9.

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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