

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JOHN D. WHITMAN  
and JEFF JOHNSON

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Appeal No. 2001-1633  
Application 09/092,543

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ON BRIEF

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Before JERRY SMITH, RUGGIERO, and BARRY, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1-5, 13-16, 24-26 and 30-32. Claim 6 has been cancelled. Claims 7-12, 17-23 and 27-29 stand withdrawn from consideration as being directed to a non-elected invention.

The disclosed invention pertains to a method for applying a fluid to the surface of a rotating silicon wafer. More particularly, the invention uses a plurality of fluid dispensing nozzles which are controlled when the dispensed fluid reaches a location on the surface of the wafer.

Representative claims 13 and 24 are reproduced as follows:

13. A method for applying a fluid to a silicon wafer surface comprising:

- rotating a receiving surface about an axis;
- flowing a fluid onto said receiving surface proximate said axis;
- projecting an energy stream against an observation location on said receiving surface;
- monitoring said observation location to gather information about said receiving surface; and
- altering the flow of said fluid to said receiving surface in view of said information.

24. A method for applying a fluid to a silicon wafer surface comprising:

- rotating a receiving surface about an axis;
- dispensing a fluid from a first nozzle adjacent said axis onto said receiving surface;
- monitoring the outward flow of said fluid along said receiving surface; and
- dispensing said fluid from a second nozzle onto said receiving surface when said fluid flows outwardly to a radius from said axis, said second nozzle being remote from said first nozzle.

The examiner relies on the following references:

Ushijima	5,393,624	Feb. 28, 1995
Lin et al. (Lin)	5,646,071	July 08, 1997

Claims 13-16 stand rejected under 35 U.S.C. § 102(e) as being anticipated by the disclosure of Ushijima. Claims 1-5, 24-26 and 30-32 stand rejected under 35 U.S.C. § 103. As evidence of obviousness the examiner offers Lin in view of Ushijima.

Rather than repeat the arguments of appellants or the examiner, we make reference to the briefs and the answer for the respective details thereof.

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OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of anticipation and obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon supports the examiner's rejection of claims 1-5, 13-16, 31 and 32. We reach the opposite conclusion with respect to claims 24-26 and 30. Accordingly, we affirm-in-part.

We consider first the rejection of claims 13-16 under 35 U.S.C. § 102(e) as being anticipated by the disclosure of Ushijima. Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed.

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Cir.); cert. dismissed, 468 U.S. 1228 (1984); W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

Claims 13-16 stand or fall together as a single group [supplemental brief, page 4]. With respect to representative claim 13, the examiner has indicated how he reads the claimed invention on the disclosure of Ushijima [answer, page 3]. Appellants argue that neither Ushijima nor Lin teaches altering the flow of fluid to the receiving surface in view of monitored information. In other words, appellants argue that the flow of fluid is never altered in the applied prior art [supplemental brief, page 9]. The examiner responds that Ushijima teaches controlling the resist film forming step in response to the measured thickness of the film [answer, pages 12-13]. Appellants respond that the cited sections of Ushijima do not support the examiner's findings [reply brief, page 2].

We will sustain this rejection of claims 13-16. Ushijima discloses that either the step of forming the resist film is controlled, the exposing step is controlled or the developing step is controlled in response to a measured thickness [column 3, line 60 to column 4, line 10]. When the resist film forming step is controlled, the control is achieved by changing the spin speed

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of a spin coater [id.]. Although this step does not control the flow rate from the dispenser per se, it does control the rate at which the fluid is distributed to the surface of the wafer away from the axis of rotation. These surface portions away from the axis of rotation also are part of the receiving surface. Since claim 13 only recites that the flow of fluid to the receiving surface is altered, and since the flow of fluid to the outer reaches of the wafer is a function of the speed of the spin coater (as well as the dispense rate), then the step of altering as recited in claim 13 is fully met by Ushijima when the film resist forming step is controlled by changing the rotation rate of the coater. We agree with the examiner that when claim 13 is given its broadest reasonable interpretation, claim 13 is fully met by the disclosure of Ushijima.

We now consider the rejection of the claims under 35 U.S.C. § 103 based on Lin and Ushijima. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why

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one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985), cert. denied, 475 U.S. 1017 (1986); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments

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actually made by appellants have been considered in this decision. Arguments which appellants could have made but chose not to make in the brief have not been considered and are deemed to be waived by appellants [see 37 CFR § 1.192(a)].

The rejection is explained by the examiner on pages 4-8 of the answer. With respect to each of the rejected claims, appellants argue that the examiner has failed to establish a prima facie case of obviousness. Specifically, appellants argue that there is no motivation within the applied prior art for combining the teachings in the manner proposed by the examiner. Appellants also argue that neither reference teaches controlling the flow as recited in the claims. Appellants point out that the portions of Ushijima noted by the examiner fail to teach controlling the flow as claimed [supplemental brief, pages 4-8]. The examiner responds that Lin and Ushijima each teaches the step of controlling the forming of a resist film on a silicon wafer. The examiner indicates that it would have been obvious to control the dispensers in Lin by monitoring film thickness at a location on the surface of the wafer as taught by Ushijima [answer, pages 8-12]. Appellants respond that Ushijima does not teach controlling fluid flow based on the location of the fluid on the surface of the wafer [reply brief, pages 1-2].

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With respect to independent claim 1, this particular argument of appellants is not convincing. Lin teaches that a plurality of resist film dispensers can be independently controlled to control the application of photoresist to the surface of a wafer. Lin does not describe, however, what parameters and conditions are used to determine the amount of fluid flow from each dispenser. Ushijima teaches that the amount of photoresist fluid which is spread to the surface of a wafer is controlled in response to the thickness of the film measured at a particular location where a light is projected on the wafer. Thus, the examiner proposes to control the plurality of fluid dispensers as taught by Lin by measuring the thickness of the film at a particular location of the silicon wafer as taught by Ushijima. We agree with the examiner that it would have been obvious to the artisan to use the sensor of Ushijima to monitor the thickness of the film in Lin at some location on the wafer as the basis to control the plurality of fluid dispensers in Lin. When the dispensers of Lin are controlled by thickness sensors as taught by Ushijima, the control of fluid flow from the Lin dispensers would be based on determinations that the fluid has reached some location on the surface of the wafer as detected by the Ushijima sensors. This operation would meet the invention as

recited in claim 1. Therefore, we sustain the examiner's rejection of claims 1-5.

With respect to claim 24, appellants additionally argue that neither Ushijima nor Lin teaches the step of dispensing the fluid from the second nozzle when the fluid from the first nozzle flows outwardly to a radius from the axis [supplemental brief, page 9]. The examiner responds that Ushijima teaches monitoring the surface of the wafer at a location away from the axis of rotation.

We will not sustain the examiner's rejection of independent claim 24 and of claims 25 and 26 which depend therefrom. Claim 24 recites a method in which the fluid from the second nozzle is controlled as a function of the flow of fluid from the first nozzle. Although Lin teaches that the two nozzles are separately and independently controlled, there is no description in Lin of how to relate the control of one nozzle to the control of the other nozzle. Thus, Lin provides no specific suggestion that the second nozzle should be controlled only when fluid from the first nozzle has flowed outwardly to some radius from the axis of rotation. Therefore, the applied prior art fails to support the examiner's rejection of claims 24-26.

With respect to claim 30, appellants additionally argue that neither Ushijima nor Lin teaches the step of dispensing the fluid at a second radius from the axis when the fluid dispensed at a first radius flows to a radius from the axis [supplemental brief, page 10]. The examiner again responds that Ushijima teaches monitoring the surface of the wafer at a location away from the axis of rotation. The recitation in claim 30 is similar to the recitation of claim 24. That is, claim 30 recites that flow at a second radius (nozzle 2) is dispensed when fluid dispensed at a first radius (nozzle 1) has flowed to some radius from the axis. As noted above, Lin provides no suggestion of controlling the dispensing of fluid at the second nozzle as a function of fluid dispensed from the first nozzle reaching some location on the surface of the wafer. Therefore, we do not sustain the examiner's rejection of claim 30.

With respect to claims 31 and 32, appellants additionally argue that neither Ushijima nor Lin teaches the step of altering the fluid flow [supplemental brief, page 10]. The examiner responds that Ushijima teaches altering the fluid flow as claimed. As noted above with respect to claim 13, Ushijima teaches that the flow of fluid onto the receiving surface is altered as a function of measured thickness based on changing the

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rotational speed of the coater. Therefore, the control in Lin based on measurements of thickness as taught by Ushijima would similarly alter the flow of fluid onto the receiving surface of Lin. Therefore, we agree with the examiner that the combination of Lin and Ushijima teaches altering the flow of fluid at a first radius from said axis as claimed.

In summary, we have sustained the examiner's rejections with respect to claims 1-5, 13-16, 31 and 32, but we have not sustained the rejection of claims 24-26 and 30. Therefore, the decision of the examiner rejecting claims 1-5, 13-16, 24-26 and 30-32 is affirmed-in-part.

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

AFFIRMED-IN-PART

JERRY SMITH	)	
Administrative Patent Judge	)	
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	)	BOARD OF PATENT
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	)	APPEALS AND
JOSEPH F. RUGGIERO	)	
Administrative Patent Judge	)	INTERFERENCES
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LANCE LEONARD BARRY	)	
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