The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RAYMON F. THOMPSON,
ROBERT W. BERNER, GARY L. CURTIS,
STEPHEN P. CULLITON and BLAINE G. WRIGHT

Appeal No. 2002-1823
Application 09/575,551

ON BRIEF

Before FRANKFORT, STAAB, and MCQUADE, Administrative Patent Judges.

MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Raymon F. Thompson et al. appeal from the final rejection of claims 56, 57, 62, 64 and 65, all of the claims pending in the application.

THE INVENTION

The invention relates to “automated semiconductor wafer processing systems for performing liquid and gaseous processing of . . . semiconductor wafers, data disks, semiconductor

substrates and similar articles requiring very low contaminant levels" (specification, page 1). Representative claim 56 reads as follows:

56. A method for processing a semiconductor wafer, data disk, semiconductor substrate and similar article[s] requiring very low contaminant levels comprising the steps of:
moving a sealed container, holding at least one article in a horizontal orientation, to an interface port of a processing system;
unsealing the container by removing a panel of the container, to provide access to the article in the container,
engaging the article with an engagement head;
pivoting the engagement head to move the article from a horizontal orientation into a vertical orientation;
releasing the article from the engagement head;
placing the article on a shelf with the article in a vertical orientation;
lifting the article off of the shelf with a transfer robot;
carrying the article on the robot to a process chamber;
opening the process chamber;
moving the article into the process chamber;
closing the process chamber;
processing the article in the process chamber.

THE PRIOR ART

The references relied on by the examiner to support the final rejection are:

Kawabata	4,744,715	May 17, 1988
Iwai et al. (Iwai)	5,562,383	Oct. 8, 1996

THE REJECTIONS

Claims 56, 57, 62, 64 and 65 stand rejected under 35 U.S.C. § 112, second paragraph, as failing to particularly point out and

distinctly claim the subject matter the appellants regard as the invention.

Claim 65 stands rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which is not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the appellants, at the time the application was filed, had possession of the claimed invention.

Claims 56, 57, 62, 64 and 65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwai in view of Kawabata.

Attention is directed to the appellants' brief (Paper No. 9) and to the examiner's final rejection and answer (Paper Nos. 6 and 10) for the respective positions of the appellants and the examiner regarding the merits of these rejections.

DISCUSSION

I. Petitionable matter

On pages 4 and 5 in the brief, the appellants raise as an issue in the appeal an objection to the drawings made by the examiner in the final rejection. As this objection is not directly connected with the merits of issues involving a rejection of claims, it is reviewable by petition to the Director rather than by appeal to this Board (see In re Hengehold, 440

F.2d 1395, 1403-1404, 169 USPQ 473, 479 (CCPA 1971)), and hence will not be further addressed in this decision.

II. The 35 U.S.C. § 112, second paragraph, rejection

The examiner considers claims 56, 57, 62, 64 and 65 to be indefinite due to the reference in the preambles of independent claims 56 and 65 to "similar articles." According to the examiner, "it is unclear what articles are part of the claimed invention" (final rejection, page 3).

The appellants, referring to the passage from page 1 in the specification reproduced above, submit that "[t]he term 'and similar articles requiring very low contaminant levels,' within the context of claims 56 and 65, read in light of the specification meets the requirements of 35 USC § 112, second paragraph, as the person skilled in the art will understand the classification of articles included by the claim language" (brief, page 6).

The second paragraph of 35 U.S.C. § 112 requires claims to set out and circumscribe a particular area with a reasonable degree of precision and particularity. In re Johnson, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977). The purpose of this requirement is to provide those who would endeavor, in future enterprise, to approach the area circumscribed by the claims of a

patent with the adequate notice demanded by due process of law, so that they may more readily and accurately determine the boundaries of protection involved and evaluate the possibility of infringement and dominance. In re Hammack, 427 F.2d 1378, 1382, 166 USPQ 204, 208 (CCPA 1970).

The appellants' argument that a person of ordinary skill in the art reading the references in claims 56 and 65 to "similar articles" in light of the specification would appreciate the class of articles included thereby is not persuasive. The specification merely mirrors the claim language at issue and provides no guidance as to which articles similar to the expressly recited semiconductor wafer, data disk and semiconductor substrate might be covered (see Ex parte Remark, 15 USPQ2d 1498, 1500 (Bd. Pat. App. & Int. 1990); Ex parte Kristensen, 10 USPQ2d 1701, 1703 (Bd. Pat. App. & Int. 1989)). Thus, the "similar articles" limitations in claims 56 and 65 are vague and indefinite and render the scope of these claims unclear.

We shall therefore sustain the standing 35 U.S.C. § 112, second paragraph, rejection of independent claims 56 and 65 and dependent claims 57, 62 and 64.

III. The 35 U.S.C. § 112, first paragraph, rejection

Claim 65 recites a processing method comprising, inter alia, the steps of engaging an article with an engagement head by moving the engagement head in a "first direction," and carrying the article on a transfer robot to a process chamber by moving the transfer robot "in a second direction, perpendicular to the first direction."

The examiner submits that the appellants' specification lacks support for the limitation that the second direction is "perpendicular" to the first direction, and thus fails to comply with the written description requirement of § 112, ¶ 1. In the examiner's view, "[a]lthough it is true that this feature is shown in figures 1, 13 and 14, it is not shown in figure 49 or otherwise disclosed with respect to the embodiment of figures 40-49 to which the claims are limited" (final rejection, page 2).

The test for determining compliance with the written description requirement is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventors had possession at that time of the later claimed subject matter, rather than the presence or absence of literal support in the specification for the claim language.

In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983). The content of the drawings may also be considered in determining compliance with the written description requirement. Id.

A review of the appellants' original disclosure shows that claim 65 does in fact read on a processing method embodying the loading subsystem 600 shown in Figures 40 through 49. In describing these drawing figures, the original specification states that "Fig. 40 in particular shows the important parts of this loading subsystem in isolation from other parts of a system otherwise similar to processing system 40. Figs. 41-49 show schematic representations of an alternative processing system otherwise similar to processor 40 which has been adapted to include loading subsystem 600" (page 52). In processor 40, robot arm 157 moves along a guide track 258 to carry wafers between an interface section 43 and processing stations 71-73 (see page 25 in the original specification and Figures 13 through 15). Consistent therewith, Figure 49 shows "wafer transfer robot 157 in position to engage wafer carrier 51 for movement to a desired processing chamber" (specification, page 56). Figure 49 also shows wafer transfer robot 157 mounted for movement on the guide track 258 in a direction perpendicular to the direction in which

the engagement head 616 moves to engage the article. Thus, the disclosure of the application as originally filed would reasonably convey to the artisan that the appellants had possession at that time of the method now recited in claim 65 including the steps of engaging an article with an engagement head by moving the engagement head in a first direction, and carrying the article on a transfer robot to a process chamber by moving the transfer robot in a second direction perpendicular to the first direction.

Accordingly, we shall not sustain the standing 35 U.S.C. § 112, first paragraph, rejection of claim 65.

IV. The 35 U.S.C. § 103(a) rejection

Iwai, the examiner's primary reference, discloses a heat treatment apparatus for semiconductor wafers. In applying this reference, the examiner focuses on the embodiment shown in Figures 1 through 10. Iwai summarizes this embodiment as follows:

> [t]he treatment apparatus according to the first embodiment of the present invention comprises a process tube 1, a loading chamber 8, an input/output chamber 13, a cassette accommodating vessel port 14, and a holding member accommodating chamber 16. The process tube 1 is a treatment chamber that performs a predetermined treatment of a wafer W that is a workpiece. The loading chamber 8 has a transfer mechanism 12 that loads and unloads a wafer boat 6 into and from the process tube 1. The wafer boat 6 serves

> as a holding member that contains a large number of (for example, 100) wafers W. The input/output chamber 13 inputs and outputs the wafers W to and from the loading chamber 8. The cassette accommodating vessel port 14 is disposed in the input/output chamber 13. The holding member accommodating chamber 16 is disposed between the loading chamber 8 and the input/output chamber 13. The holding member accommodating chamber 16 accommodates the wafer boat 6. A cassette receiving mechanism 17 and a clean air blowing means 18 are disposed in the input/output chamber 13. The cassette receiving mechanism 17 receives a cassette C from a cassette accommodating vessel. The clean air blowing means 18 forces a side flow of clean air into the cassette C [column 6, lines 18 through 41].

As conceded by the examiner (see page 4 in the final rejection), Iwai does not respond to the limitations in independent claim 56, and the corresponding limitations in independent claim 65, requiring the article to be held in a sealed container in a horizontal orientation, engaged and moved by an engagement head from the horizontal orientation into a vertical orientation and placed on a shelf in the vertical orientation. Although Iwai's article (wafer W) is held in a sealed container (cassette accommodating vessel 30) in a horizontal orientation, it remains in the horizontal orientation as it is engaged and moved by an engagement head (elements 42A and 43), placed on a shelf (carrier transfer 46), and further transported through the apparatus into the process chamber

(process tube 1). To cure these deficiencies in Iwai, the examiner turns to Kawabata.

Kawabata discloses a method of transferring semiconductor wafers W from a horizontal orientation in one box type carrier C1 to a horizontal orientation in another box type carrier C2. During the transfer, the carriers are pivoted such that the wafers are removed from the first carrier, transported between the two carriers and placed into the second carrier, all while in a vertical orientation.

In proposing to combine Iwai and Kawabata to reject the appealed claims, the examiner submits that it would have been obvious to one of ordinary skill in the art

> to have modified the apparatus of Iwai et al by moving the article from a horizontal to a vertical orientation as the engagement head transferred the article from the docking station to the shelf, as Kawabata teaches that moving wafers in a carrier from a horizontal to a vertical orientation prior to their processing is well known in the art, as certain processes are desirably performed on wafers in a vertical orientation [final rejection, pages 4 and 5].

The Iwai apparatus, however, is a so-called upright heat treatment apparatus that utilizes an upright cylindrical process tube 1 adapted to receive an upright wafer boat 6 carrying a stack of horizontally oriented wafers (see column 1, lines 23 through 44; and column 7, line 31, through column 8, line 12).

Modifying the Iwai method in the manner proposed by the examiner so as to move the articles/wafers from a horizontal orientation to a vertical orientation as the engagement head transfers them to the shelf would be counterproductive in that the articles would have to be moved back to the horizontal orientation for receipt by the wafer boat 6 and insertion into the process tube 1. Moreover, there is nothing in the combined teachings of Iwai and Kawabata which would have motivated the artisan to reconstruct the Iwai apparatus to process or treat the wafers in a vertical orientation.

It is therefore evident that the only suggestion for combining Iwai and Kawabata in the manner proposed by the examiner so as to arrive at the method recited in independent claims 56 and 65 stems from hindsight knowledge impermissibly derived from the appellants' disclosure. Consequently, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claims 56 and 65, and dependent claims 57, 62 and 64, as being unpatentable over Iwai in view of Kawabata.

SUMMARY

The 35 U.S.C. § 112, second paragraph, rejection of claims 56, 57, 62, 64 and 65 is sustained; the 35 U.S.C. § 112, first paragraph, rejection of claim 65 and the 35 U.S.C. § 103(a)

rejection of claims 56, 57, 62, 64 and 65 are not sustained. Since at least one rejection of each claim is sustained, the decision of the examiner to reject claims 56, 57, 62, 64 and 65 is affirmed.

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

AFFIRMED

CHARLES E. FRANKFORT Administrative Patent Judge	)
LAWRENCE J. STAAB Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
JOHN P. MCQUADE Administrative Patent Judge	)

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