

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

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICK BJELOPAVLIC, ALEXIS GRABBE,
MICHELE HALER and TRACY M. RAGAN

Appeal No. 2005-1108
Application No. 10/442,900

ON BRIEF

Before MCQUADE, NASE and BAHR, Administrative Patent Judges.
MCQUADE, Administrative Patent Judge.

DECISION ON APPEAL

Mick Bjelopavlic et al. appeal from the final rejection (mailed August 26, 2004) of claims 1 through 8, 10 through 12 and 20 through 25. Claims 13 through 19 stand allowed, and claim 9, the only other claim pending in the application, stands objected to as depending from a rejected base claim.

THE INVENTION

The invention relates to "wafer carriers for retaining semiconductor wafers during processing operations"

Appeal No. 2005-1108
Application No. 10/442,900

(specification, page 1). Representative claim 1 reads as follows:¹

1. A wafer carrier for retaining at least one semiconductor wafer in a processing apparatus during a processing operation which removes wafer material by at least one of abrading and chemical reaction, said processing apparatus adapted for removing wafer material from a front side and a back side of each wafer simultaneously, the carrier comprising:

a plate including wafer contaminating material and having an opening and a thickness; and

an insert having a thickness and being disposed in the opening of the plate for receiving at least one wafer and engaging a peripheral edge of the wafer to hold the wafer as the carrier rotates, the thickness of the insert being at least about 20 microns greater than the thickness of the plate to inhibit removal of the contaminating material from the plate during processing and thereby inhibit contamination of the wafer.

THE PRIOR ART

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

Desai et al. (Desai)	5,422,316	Jun. 06, 1995
Zhang et al. (Zhang)	6,454,635	Sep. 24, 2002

¹ In the event of further prosecution, steps should be taken to correct the lack of proper antecedent basis in claim 5 for the reference to "the surface area of exposed metal" and the inconsistency between the preambles of dependent claims 21 through 25 and the subject matter recited in parent claim 20.

THE REJECTIONS

Claims 1 through 4, 6 through 8, 10 through 12 and 20 through 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang in view of Desai.

Attention is directed to the main and reply briefs (filed November 16, 2004 and February 4, 2005) and the answer (mailed December 16, 2004) for the respective positions of the appellants and the examiner regarding the merits of these rejections.²

DISCUSSION

Zhang, the examiner's primary reference, discloses a semiconductor wafer carrier used in an apparatus for removing material from the front and back surfaces of a wafer by abrading and/or chemical reaction. The apparatus 23 includes an upper platen 25, an upper polishing pad 29, a lower platen 27 and a lower polishing pad 31. The wafer carrier 21, which in use is disposed between the polishing pads, comprises a circular metal blank 32 having three openings 34 and three ring-shaped plastic

² In the final rejection, claim 12 also stood rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Upon reconsideration, the examiner has withdrawn this rejection (see page 2 in the answer).

Appeal No. 2005-1108
Application No. 10/442,900

inserts 39 mounted in the openings for holding respective wafers W. The inserts act as buffers between the wafers and the blank to protect the edges of the wafers from damage. Under repeated processing operations, the plastic inserts, which are softer than the metal blank, will gradually wear away until they reach a minimum thickness at which the quality of the processed wafers will suffer. To combat this problem, Zhang provides for the inserts to be removably mounted in the blank to allow them to be replaced when necessary. Zhang teaches that the preferred thickness of a new insert is about 1 to 2 microns thinner than the "target" or end thickness of a polished wafer (see column 4, lines 35 through 37), that the preferred thickness of the blank is about 10 microns less than the thickness of a new insert (see column 4, lines 44 and 45), and that the inserts should be replaced after they are worn to a minimum thickness of about 10-15 microns less than the "target" thickness of the wafer (see column 5, lines 23 through 26).

As framed and argued by the appellants, the dispositive issue in the appeal is whether Zhang would have rendered obvious a wafer carrier responding to the limitation in independent claim 1, and the corresponding limitation in independent claim 20, requiring the thickness of the insert to be at least about 20

microns greater than the thickness of the plate to inhibit removal of contaminating material (e.g., metal) from the plate and resulting contamination of the wafer. While conceding that Zhang does not teach this feature, the examiner nonetheless submits that it would have been obvious

to select the thickness of the insert at about 20, 30 or 50 microns greater than the thickness of the plate in order to extend the useful life of the plate as a bigger gap is maintained between the plate and the polishing pads during a polishing operation and to save material and cost associated with the replacement of the plate [answer, page 4].³

The examiner's explanation fails to spell out whether the proposed selection of the thickness of Zhang's insert 39 to be about 20, 30 or 50 microns greater than the thickness of the plate/blank 32 would be achieved by increasing the thickness of the insert, reducing the thickness of the plate/blank or some combination of the two. Simply increasing the thickness of the insert the requisite amount would make the insert thicker than the target thickness of the wafer in direct contravention of

³ This rationale differs from that set forth in the final rejection where the examiner stated that the proposed modification to Zhang would have been obvious "since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involved only routine skill in the art" (page 3). As this reasoning is not restated in the answer, we assume that it has been withdrawn by the examiner (see Ex parte Emm, 118 USPQ 180, 181 (Bd. App. 1957)).

Appeal No. 2005-1108
Application No. 10/442,900

Zhang's teachings, a result which clearly would be untenable.⁴ Decreasing the thickness of the plate/blank ostensibly would weaken same and surely reduce its useful life due to wear. As pointed out by the appellants, Zhang evidences no appreciation of the problem solved by the claimed provision of an insert having a thickness at least about 20 microns greater than the thickness of the plate, namely: to inhibit removal of contaminating material from the plate and any resulting contamination of the wafer. Indeed, Zhang's allowance that the inserts need not be replaced until they are slightly thinner than the plate would exacerbate this problem even while solving the particular wafer quality problem addressed by the reference. Given the totality of these circumstances, it is apparent that the only suggestion for modifying Zhang's wafer carrier such that the thickness of the insert is at least about 20 microns greater than the thickness of the plate as recited in independent claims 1 and 20 stems from hindsight knowledge impermissibly gleaned from the appellants' disclosure.

⁴ Zhang explains with respect to a prior art ring R (see Figure 7), which corresponds to the inserts 39, that the ring must be "slightly thinner than the wafer, so that the pads of the polishing machine will contact substantially the entirety of both sides of the wafer" (column 1, lines 22 through 24).

Appeal No. 2005-1108
Application No. 10/442,900

Accordingly, we shall not sustain the standing 35 U.S.C. § 103(a) rejection of claims 1 and 20, and dependent claims 2 through 4, 6 through 8, 10 through 12 and 21 through 25, as being unpatentable over Zhang.

As the examiner's citation of Desai does not cure the foregoing deficiencies of Zhang relative to the subject matter recited in parent claim 1, we also shall not sustain the standing 35 U.S.C. § 103(a) rejection of dependent claim 5 as being unpatentable over Zhang in view of Desai.

Appeal No. 2005-1108
Application No. 10/442,900

SUMMARY

The decision of the examiner to reject claims 1 through 8,
10 through 12 and 20 through 25 is reversed.

REVERSED

JOHN P. MCQUADE)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
JEFFREY V. NASE)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
JENNIFER D. BAHR)	
Administrative Patent Judge)	

JPM/gjh

Appeal No. 2005-1108
Application No. 10/442,900

SENNIGER, POWERS, LEAVITT AND ROEDEL
ONE METROPOLITAN SQUARE
16TH FLOOR
ST. LOUIS, MO 63102