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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/100,585	05/04/2011	Kuo-Kuei Fu	NANYA-PT005.1	3289

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EXAMINER	
RUGGLES, JOHN S	

ART UNIT	PAPER NUMBER
1721	

NOTIFICATION DATE	DELIVERY MODE
09/27/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eoffice@volpe-koenig.com

Office Action Summary	**Application No.** 13/100,585	**Applicant(s)** FU, KUO-KUEI	
	Examiner JOHN S. RUGGLES	**Art Unit** 1721	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-6* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-6* is/are rejected.

8)☒ Claim(s) *1-6* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *04 May 2011* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 12/348,470.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/4/11*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Priority

The *instant* application 13/100,585 is a divisional (DIV) of parent application 12/348,470 filed on 1/5/09, now US Patent 7,984,392 issued on 7/19/11, which claims foreign priority to TW-097141354 filed on 10/27/08 in Taiwan.

However, Applicant cannot rely upon the foreign priority paper(s) listed above to overcome any rejection in this Office action, because English translation(s) of said foreign priority paper(s) have not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Specification

The disclosure is objected to, at least because of the following *exemplary* informalities: **(1)** in [0001]/L1-2, the instant divisional (DIV) priority to the parent application "12/348,470, filed January 5, 2009," should be updated and extended in the form --12/348,470, filed January 5, 2009, now US Patent 7,984,392 issued on July 19, 2011, claiming foreign priority as well to TW-097141354 filed on October 27, 2008 in Taiwan--; **(2)** in [0002]/L2, "step" must be corrected as --~~step~~ steps--; **(3)** in [0041]/L1, "form" must be corrected as --~~form~~ from--; **(4)** in [0052]/L4, "patterns" must be corrected by addition of a period as --~~patterns~~ patterns.--. **(5)** Applicant should make additional corrections throughout the remainder of the specification as needed in order to clarify the disclosure. Appropriate correction is required.

(6) The *abstract* on page 14 of the disclosure is objected to, because it does not adequately describe the remaining claims 1-6 in this DIV application. Correction is required. See MPEP § 608.01(b).

(7) The *title* of the invention is not sufficiently descriptive of the remaining claims 1-6 in this DIV application. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: --~~MATCHING METHOD OF PATTERN LAYOUTS FROM INVERSE LITHOGRAPHY~~ REPLACED PHOTOMASK--.

Claim Objections

Claims 1-6 are objected to, because of the following informalities: **(1)** in claim 1/L4-5, "plurality of first groups each of which" should be corrected by addition of a comma as shown --plurality of first ~~groups~~ groups, each of which--; **(2)** in claim 1/L8, "initial layout patterns and" should be rewritten with a comma added as shown --initial layout ~~patterns~~ patterns, and--; **(3)** in claim 4/L1-2, "each of the plurality of first groups each of which" is repetitive and should be shortened as --each of the plurality of first groups ~~each of which~~--. Appropriate correction is required. Claims 2-6 depend from claim 1, and claim 5 depends from claim 4.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which Applicant regards as the invention.

(A) In claim 1/L5, **(1)** "each of which" should be clarified as --each of ~~which~~ the first groups--, and **(2)** "is reproduced" should be clarified as --each of the first groups is reproduced--. Claims 2-6 depend from claim 1.

Claim Rejections - 35 USC § 102 or § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Miyazaki et al. (US 2002/0042007).

Miyazaki et al. teach a modified (or replaced) photomask (MR9(M), [0055], [0184]), which is exemplified in Figures 33(a)-(b) as reproduced below for Applicant's convenience.

FIG. 33(a)

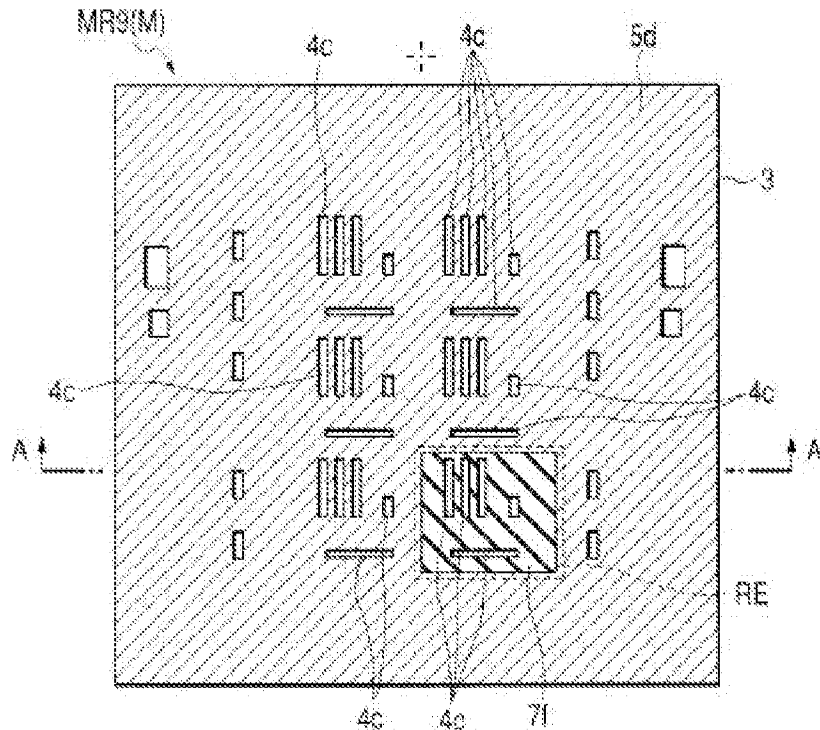
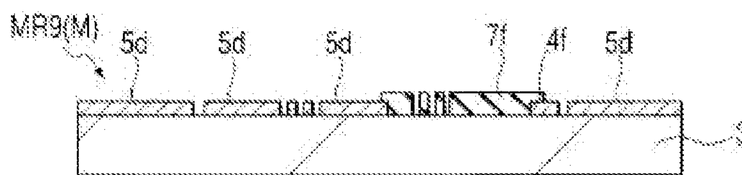


FIG. 33(b)



This replaced photomask (MR9(M) in *Miyazaki et al.* Figures 33(a)-(b) shown above) includes: *[a]* a substrate (3); and *[b]* a plurality of etched patterns (as openings 4c through a light blocking layer 5d of metal, [0181]) formed on the substrate (3) according to *[c]* a photomask layout (or design) that can be envisioned as having *[c1]* a plurality of photomask layout patterns (e.g., each corresponding to an etched pattern 4c, etc.) categorized into *[c2]* a plurality of first groups (such as five separate first groups), *[c2a]* each of the first groups

includes *[c2b]* a plurality of identical initial layout patterns (for instance, consisting of a set of three identical vertical rectangular shapes, each having the same shape and size, duplicated into each of the first groups, reading on *instant claims 4-5*), and *[c2c]* each of the first groups can be reproduced from *[c3]* an initial layout (or an original design) having *[c3a]* a plurality of initial layout patterns (e.g., each designed to form an etched pattern 4c, etc.) categorized into *[c3b]* a plurality of second groups (such as five separate second groups, each having a horizontal rectangular shape and/or a shorter vertical rectangular shape) to which the plurality of first groups (such as the five separate first groups, each having the set of three identical vertical rectangular shapes) respectively correspond, wherein [c3c] the plurality of photomask layout patterns (e.g., each corresponding to an etched pattern 4c, etc.) respectively correspond to the plurality of initial layout patterns (e.g., each designed to form an etched pattern 4c, etc.), and *[c4]* at least one of the plurality of the photomask layout patterns (corresponding to a lower right hand corner region 4f on the photomask) is replaced by a photomask layout pattern having the same structure as a combined one of the first groups with a corresponding one of the second groups (for producing a duplicated pattern of etched openings 4c in the light blocking film 7f made of resist, [0184]).

In the replaced photomask of *Miyazaki et al.* Figures 33(a)-(b), the replaced pattern region (with replacement openings 4c through the resist light blocking film 7f in region 4f) has the same structure as each of the original photomask patterns (with etched openings 4c through the light blocking metal layer 5d). This repetition of the same structure would be reasonably assured by making the replaced pattern (in region 4f) on the replaced photomask from an

inherently standardized photomask layout pattern (which could also be used for making the original photomask patterns on the replaced photomask, reading on *instant claim 1*).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 2002/0042007) as discussed above in view of Applicant's Admitted Prior Art (AAPA).

Miyazaki et al. do not specifically teach: ***[1]*** that the plurality of photomask layout patterns are obtained from inversing the plurality of initial layout patterns (*instant claim 2*).

However, inversing of initial layout patterns is a known technique in the prior art design of photomasks (which Applicant admits to be known prior art, AAPA, as exemplified by *instant* prior art Figure 1, described at [0007], [0034] of the instant specification).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention in the replaced photomask (having a plurality of etched patterns formed on a substrate by using a plurality of photomask layout patterns that include an *inherently* standardized photomask layout pattern (as taught or suggested by *Miyazaki et al.*) to obtain the plurality of photomask layout patterns from inversing a plurality of initial layout patterns ***[1]***; because inversing of initial layout patterns is a known technique in the prior art design of photomasks (AAPA).

Claims 3, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyazaki et al. (US 2002/0042007) as discussed above in view of Cohn et al. (US 6,430,733).

Miyazaki et al. do not specifically teach: ***[2]*** that the at least one of the plurality of photomask layout patterns is automatically replaced by an algorithm (*instant claim 3*); or ***[3]*** that the standardized photomask layout pattern is determined by simulating the plurality of

photomask layout patterns and then by selecting one of the plurality of photomask layout patterns as the standardized photomask layout pattern according to a result of the simulation (*instant claim 6*).

Cohn et al. teach that there are many different algorithms, which are useful for adjusting designed shapes (such as a plurality of photomask layout patterns). In one exemplary algorithm, shapes adjustment rules are applied for (automatically) replacing shape portions (such as corners) on the photomask layout patterns (for instance by using beveling parameters). Resulting images closely approximate those found on actual photomasks. The resulting images are then used as input to lithography modeling programs (e.g., for simulating photomask layout patterns, etc.) to predict shapes of wafer level images. Accounting for distortions introduced by a photomask making process aids significantly in the improvement of a process window (c6/L6-18).

It would have been obvious to one of ordinary skill in the art at the time of the invention in the replaced photomask (having a plurality of etched patterns formed on a substrate by using a plurality of photomask layout patterns that include an *inherently* standardized photomask layout pattern (as taught or suggested by *Miyazaki et al.*) to use an algorithm for automatically replacing at least one of the plurality of photomask layout patterns (as exemplified by *Cohn et al.*, ***[2]***), or to determine the standardized photomask layout pattern by modeling or simulating the plurality of photomask layout patterns and then by selecting one of the plurality of photomask layout patterns as the standardized photomask layout pattern according to a result of the simulation (as exemplified by *Cohn et al.*, ***[3]***); because doing so would provide a reasonable expectation of success for improving a process window from the resulting replaced photomask (as suggested by *Cohn et al.*).

Conclusion and Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN S. RUGGLES whose telephone number is (571)272-1390. The examiner can normally be reached on Monday-Wednesday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. R./
Examiner, Art Unit 1721

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1721