

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

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* KOICHI WAGO  
and GENNADY GAUZNER

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Appeal 2006-2899  
Application 09/972,159  
Technology Center 1700

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Decided: March 28, 2007

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Before THOMAS A. WALTZ, CATHERINE Q. TIMM and  
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claims 7-10 and 13, the only claims pending in this application.

## BACKGROUND

The invention relates to a stamper for forming sub-micron sized features and patterns in substrate surfaces using imprint lithography. The invention is used, for example, in the formation of servo patterns in the surfaces of substrates used in information storage and retrieval media. (Specification [02]). According to Appellants, they have discovered that “degradation of pattern replication arising from resist damage, loss of dimensional accuracy, peeling, sticking, etc., can be eliminated, or at least minimized by the use of a thin lubricating coating on the imprinting surface of the stamper.” (Specification [24]).

Claim 7 is illustrative of the invention and is reproduced below:

7. A method of fabricating a coating on a stamper that is suitable for sub-micron imprint lithography, the method comprising:

dipping a stamper suitable for thermal imprint lithography having an imprinting surface thereon and having submicron features in a solution containing a lubricant; and

removing the stamper from the solution to apply a lubricant coating having a thickness of no more than about the smallest feature height on the stamper.

The Examiner relies on the following prior art references to show unpatentability:

Horigome	US 5,330,880	Jul. 19, 1994
Flynn	US 5,663,127	Sep. 2, 1997
Meldrum	US 5,853,506	Dec. 29, 1998

The Examiner made the following grounds of rejection:

1. Claims 7-10 and 13 under 35 U.S.C. § 103(a) as unpatentable over Horigome in view of Meldrum.
2. Claims 10 and 13 under 35 U.S.C. § 103(a) as unpatentable over Horigome in view of Meldrum and further in view of Flynn.

### **ISSUE**

The Examiner contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Horigome's method by dipping Horigome's stamper into a lubricant as taught by Meldrum. (Answer 4). Appellants argue that the Examiner has failed to explain why one of ordinary skill in the art would have been led to modify Horigome's method based on Meldrum, which is directed to an unrelated process. (Br. 7). The issue is: Has the Examiner properly identified a reason, suggestion, or motivation to combine Horigome and Meldrum in the manner claimed?

For the reasons discussed below, we answer this question in the negative.

### **FINDINGS OF FACT**

- 1) Horigome discloses "a process for producing optical disks comprising the steps of subjecting the photoresist layer on a substrate . . . to light exposure, developing and etching treatments to obtain a stamper and then duplicating an information pattern for an optical disk from the stamper." (col. 3, ll. 21-26).

- 2) Horigome teaches that the surface of the stamper (made of silicon, quartz, glass or a metal) is preferably treated with at least one releasing agent or lubricant selected from fluorine-containing organic compounds and silicon-containing organic compounds to facilitate the peeling of the replicated substrate off the stamper. (col. 4, ll. 21-26).
- 3) Horigome teaches that the function of the stamper releasing agent is to reduce the peeling force by lowering the surface energy of the stamper. (col. 5, ll. 20-22).
- 4) In Horigome Example 1, a fluorine containing organic compound is chemically bonded to the silicon surface by spin-coating or evaporating to cover the surface with the molecules of the compound and then heat-treating at 100°C for 10 minutes. (col. 7, ll. 20-24).
- 5) Meldrum is directed to a method of enhancing the working life of cold working die surfaces. (col. 1, ll. 6-7).
- 6) Meldrum teaches that when a metal work piece is deformed as it is forced against a die surface, micro particles of the work piece may be transferred to the die surface causing scratching or grooving in subsequent work pieces prepared with the same die. (col. 1, ll. 25-29).
- 7) According to Meldrum, unsatisfactory prior art solutions to this problem include applying a lubricant to the exterior of the die working surface (col. 1, ll. 29-33) and adhering layers to the die surface (col. 1, ll. 58-67).
- 8) Meldrum's method of treating metal working dies includes the steps of a) forming a metal working die part from a particulate material such as sintered alloys, ceramics, carbidic or metallic powder (col. 2, ll. 37-39), b) immersing the metal working die part in a lubricant, c) raising the

pressure and temperature of the lubricant for a time sufficient to allow the lubricant to migrate and be trapped within the micro pores of the die part, and c) removing the die part from the lubricant in order to place it into use. (col. 2, ll. 8-20).

- 9) Meldrum states that the lubricants have a chemistry that promotes impregnation under the specified temperature (i.e., 80-120°C) and pressure (i.e. 1000-3500 psi) parameters, and an ambient temperature viscosity that allows for flow to the surface of the tool if the exterior film of lubricant is wiped or scratched away during use. (col. 3, ll. 67- col. 4, l. 2 and col. 4, ll. 16-21).
- 10) Meldrum states that where a chlorinated paraffin/ester was used as the lubricant, temperature and pressure conditions were retained for about 90-100 hours. (col. 4, ll. 2-6).

#### ANALYSIS AND CONCLUSIONS

The Examiner maintains that:

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify Horigome et al by providing a lubricant layer onto the stamper by dipping it into the lubricant as taught by Meldrum, because when the stamper is dipped into the lubricant batch, the lubricant would contact the stamper evenly from all sides to form a uniform lubricant layer. (Answer 4).

The Examiner attempts to support this finding of motivation to combine Horigome and Meldrum by pointing out that Horigome's stamper and Meldrum's mold parts are both made of metal and that both references are directed to solving problems in the molding art. (Answer 6).

As noted by Appellants, the mere fact that Horigome could have been modified by dipping Horigome's stamper into a lubricant as taught by Meldrum does not make the modification obvious unless the prior art suggested the desirability of the modification. *See In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). Appellants argue, and we agree, that the Examiner has simply not provided the requisite evidentiary support for a finding of motivation to combine the applied prior art. (Br. 4). In particular, the Examiner has not identified any teaching or suggestion in the prior art which would have led one of ordinary skill in the art to conclude that dipping Horigome's stamper into a lubricant as taught by Meldrum would produce the desired lubricant layer. *See In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). Where, as here, the Examiner does not explain the motivation, suggestion, or teaching that would have led the skilled artisan at the time of the invention to the claimed combination as a whole, we infer that the Examiner relied on improper hindsight reasoning to conclude that the invention was obvious. *See In re Lee*, 277 F.3d 1338, 1343, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002).

In view of the foregoing, the rejection of claims 7-10 and 13 under 35 U.S.C. § 103(a) as unpatentable over Horigome in view of Meldrum is reversed.

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The Examiner's reliance on Flynn is limited to the reference's disclosure of a perfluoropolyether coating layer which could include Z-Tetraol. Accordingly, the rejection of claims 10 and 13 under 35 U.S.C. § 103(a) as unpatentable over Horigome in view of Meldrum and further in view of Flynn is also reversed.

**REVERSED**

Sld/ls

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