UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MYUNG-BOK LEE,
JIN-SEUNG SOHN,
EUN-HYOUNG CHO, and
YOUNG-PIL PARK

Appeal 2008-4712
Application 10/445,209
Technology Center 1700

Decided: November 26, 2008

Before CHARLES F. WARREN, CATHERINE Q. TIMM, and MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 7-9, 12, and 15. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Appellants request review of the Examiner's rejection of:

1. claims 7, 9, and 15 under 35 U.S.C. § 103(a) as unpatentable over Nishikawa (US 2002/0048729 A1 issued Apr. 25, 2002 to Nishikawa et al.) in view of Parker (US2004/0047014 A1 issued Mar. 11, 2004 to Parker et al.); and
2. claims 8 and 12 under 35 U.S.C. § 103(a) over Nishikawa and Parker and further in view of Raguin (US 6,410,213 B1 issued Jun. 25, 2002 to Raguin et al.).

With respect to the first rejection, Appellants arguments focus on the requirements of claim 7, but also touch upon claim 15 (Br. 5-8). In accordance with 37 C.F.R. § 41.37(c)(1)(vii), we limit our discussion of the first rejection to claims 7 and 15.

With respect to the second rejection, Appellants' sole argument is that the additionally applied reference to Raguin does not cure the deficiencies of the "base rejection," i.e., the rejection over Nishikawa and Parker (Br. 8). Given that Appellants advance no additional arguments with regard to the second rejection, it stands or falls for the same reasons as the first rejection.

Claim 7 is directed to a method of fabricating a microlens array. To form microlenses on a first side of a substrate, the process uses a conventional method of depositing photoresist, patterning the resist, reflowing the resist into dome shapes, and plasma etching (Spec. 1:22 to 2:2; Figs. 1A-1D; Claim 7, steps (a)-(d)). Claim 7 further requires steps which result in forming further microlenses on the other side of the substrate (Claim 7, steps (e)-(g)). The steps, as claimed, are similar to steps (a)-(d) in

that they involve coating (depositing) photoresist, patterning, and plasma etching. Claim 7 is reproduced below:

7. A method of fabricating a microlens array, comprising:

(a) depositing a first photoresist layer on one side of a substrate;

(b) patterning the first photoresist layer to form a cylindrical photoresist mask on the substrate using a photolithographic process;

(c) forming the photoresist mask as a first profile corresponding to a microlens by melting the photoresist mask using a reflow process;

(d) forming the microlens on the substrate by transferring the first profile of the photoresist mask to said one side of the substrate using plasma etching;

(e) coating a second photoresist layer on the other side of the substrate;

(f) patterning the second photoresist layer to form a second profile thereon; and

(g) transferring the second profile of the second photoresist layer to the other side of the substrate using plasma etching.

Claim 15 further requires heating the second photoresist. Claim 15 is reproduced below:

15. The method of claim 7, further comprising, between steps (f) and (g):

heating the second photoresist layer in order to reduce surface roughness thereof.

II. DISPOSITIVE ISSUES

With regard to claim 7, the issue on appeal arising from the contentions of Appellants and the Examiner is: have Appellants identified a reversible error in the Examiner's finding of a suggestion to fabricate microlenses on two sides of a substrate, the microlenses on the second side formed by steps (e) through (g) of claim 7?

With regard to claim 15, the issue on appeal is: have Appellants identified a reversible error in the Examiner's finding that heating to melt and reflow the photoresist, as was known in the art, reduces surface roughness as required by claim 15?

IV. FINDINGS OF FACT

The following enumerated findings of fact ("FF") are of particular relevance to the issues on appeal:

1. Those of ordinary skill in the art use microlenses for light beam focusing and collimation purposes in optical systems such as light crystal display panels, other displays and imaging devices, and optical communication systems (Nishikawa, ¶ [0002]; Spec. 1:15-21).
2. It was known in the art to form a microlens array by depositing photoresist on a substrate to coat the substrate, pattern the photoresist, reflow the photoresist, and plasma etch by, for instance, reactive ion etching to form microlenses one side of the substrate as acknowledged by

Appellants' Specification and as disclosed in Nishikawa for forming a master plate 210 (Spec. 1:22 to 2:2; Nishikawa, ¶¶ [0122-0131]).[1]

3. Nishikawa describes forming a microlens array such as the array 10 shown in Figure 1C reproduced below.

Figure 1(C) shows microlens array substrate 10 with multiple lenses 12 on one side of the substrate 10.

4. According to Nishikawa,

> The microlens array substrate **10** transmits light. A plurality of lenses **12** is formed on at least one side of the microlens array substrate **10** (in many cases, it is formed only on one side). Each of the lenses **12** shown in **FIG. 1(A)** is a convex lens, but it may be a concave lens.

(Nishikawa ¶ [0036].)

[1] At the hearing of November 18, 2008, Appellants' representative newly pointed out that the portion of Nishikawa relied upon by the Examiner [¶¶ 0122-0129] to meet the claimed steps (a) through (d), in fact, is used by Nishikawa to form a master plate and not to form the microlens array itself. Appellants' in their Briefs, however, had not disputed that Nishikawa describes the microlens array forming steps of their claim 7, steps (a)-(d). Because the new argument was not made in the Briefs and no good cause has been shown in support of consideration, we do not consider it. 37 C.F.R. § 41.37(c)(vii)(2007). Moreover, any error by the Examiner in this regard was harmless since Appellants' own Specification discloses that steps (a)-(d) were known in the art for fabricating microlens arrays.

III. PRINCIPLES OF LAW

"[W]hen a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." *KSR Int'l Co. v. Teleflex Inc*., 127 S. Ct. 1727, 1741 (2007) quoting *Sakraida v. AG Pro, Inc*., 425 U.S. 273, 282 (1976).

In claims, "the term 'comprises' permits the *inclusion* of other steps, elements, or materials." *In re Baxter*, 656 F.2d 679, 686 (CCPA 1981).

V. ANALYSIS

There is no dispute here that forming microlenses on one side of a substrate by steps (a) through (d) of claim 7 was known in the art (FF 2). Nishikawa provides evidence that it was known in the art to further form microlenses on another side of the substrate (FF 4). It follows that those of ordinary skill in the art would apply the known steps, i.e., steps (a) through (d), to form the second microlens structure on the second side. Repetition of steps (a) through (d) results in a process of coating the substrate with a second photoresist as required by step (e), patterning as required by step (f), and plasma etching as required by step (g). The conventional process also requires a step of reflowing, however, claim 7, by using the transitional phrase "comprising," is open to the inclusion of the required reflow step between steps (f) and (g). The result of repeating the known steps results in what one would expect from the process, a substrate including microlenses on two sides of a substrate.

With regard to claim 7, Appellants have not identified a reversible error in the Examiner's finding of a suggestion within the prior art to fabricate microlenses on both sides of a substrate, including forming the second microlenses by a method meeting steps (e) through (g) of claim 7.

With regard to claim 15, heating to reflow the cylindrical photoresist mask would result in reducing surface roughness as required by claim 15. This would be due to the surface tension effects of melting.

With regard to claim 15, Appellants have not identified a reversible error in the Examiner's finding that heating to melt and reflow the photoresist, as was known in the art, reduces surface roughness as required by claim 15.

Appellants, in their Briefs, have limited the scope of their arguments to the above issues. It is not necessary to discuss Parker in rendering our decision.

VI. CONCLUSION

We sustain the Examiner's rejection of claims 7, 9, and 15 under 35 U.S.C. § 103(a) as unpatentable over Nishikawa in view of Parker, and the Examiner's rejection of claims 8 and 12 under 35 U.S.C. § 103(a) as unpatentable over those references further in view of Raguin.

VII. DECISION

The decision of the Examiner is affirmed.

VIII. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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BUCHANAN, INGERSOLL & ROONEY, PC
POST OFFICE BOX 1404
ALEXANDRIA VA 22314-1404