

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 56

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILBUR D. JOHNSTON JR. and JUDITH A. LONG

Appeal No. 1997-0988
Application No. 08/199,910¹

HEARD: October 20, 1999

Before HAIRSTON, LALL, and GROSS, Administrative Patent Judges.
GROSS, Administrative Patent Judge.

¹ Application for patent filed February 22, 1994. According to appellants, this application is a continuation of Application No. 08/066,605, filed May 24, 1993, now abandoned; which is a continuation of Application No. 07/808,989, filed December 17, 1991, now abandoned; which is a continuation of Application No. 07/515,545, filed April 26, 1990, now abandoned; which is a continuation of Application No. 07/338,506, filed April 14, 1989, now abandoned; which is a continuation of Application No. 07/101,303, filed September 25, 1987, now abandoned; which is a division of Application No. 06/831,113, filed February 20, 1986, now U.S. Patent No. 4,716,130, issued December 29, 1987; which is a continuation-in-part of Serial No. 06/544,215, filed October 21, 1983, now abandoned.

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DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 26 through 31, 33, 34, 36 through 44, 46, 47, 49 and 52, which are all of the claims pending in this application. In the Appeal Brief (page 3), appellants state that they do not appeal the rejection of claim 49. Accordingly, only claims 26 through 31, 33, 34, 36 through 44, 46, 47 and 52 are before us on appeal.

The appellants' invention relates to semi-insulating doped indium phosphide (InP) and devices made therefrom. Claim 52 is illustrative of the claimed invention, and it reads as follows:

52. An optoelectronic device or a laser device, said device comprising a substrate, first and second active regions of said device, and a region of semi-insulating indium phosphide based material formed on said substrate and electrically isolating said first active region from said active region wherein said region of semi-insulating indium phosphide based material is formed by the process that comprises the steps of contacting said substrate with a deposition gas stream characterized in that said substrate has a resistivity less than 10^3 ohm-cm, said semi-insulating region has a resistivity of at least 10^6 ohm-cm, said semi-insulating region is epitaxial to said substrate and said semi-insulating region is formed by introducing a dopant precursor comprising a composition chosen from the groups consisting of ferrocene based compositions and iron pentacarbonyl based compositions into said deposition gas stream wherein said deposition gas stream is produced by combining entities including an organo-indium compound and a

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source of phosphorus whereby current flow is confined to desired device paths.

No prior art references of record have been relied upon by the examiner in rejecting the appealed claims.²

Claims 26 through 31, 33, 34, 36 through 44, 46, 47, and 52 stand rejected under 35 U.S.C. § 112, first paragraph, as containing new matter.

Claim 49 is rejected under 35 U.S.C. § 102(e) over Boos, Statutory Invention Registration No. H291. Appellants indicate (Brief, page 3) that they are not appealing this rejection. Accordingly, claim 49 is not before us.

Reference is made to the Examiner's Answer (Paper No. 51, mailed September 4, 1996) for the examiner's complete reasoning in support of the rejections, and to the appellants' Appeal Brief (Paper No. 48, filed June 19, 1995) and Reply Brief (Paper No. 52, filed October 29, 1996) for the appellants' arguments thereagainst.

² We note that a rejection of claims 25 through 31, 33, 36 through 44, and 46 under 35 U.S.C. § 102(e) over Boos, Statutory Invention Registration No. H291, and a rejection of claims 25 through 49 under 35 U.S.C. § 103 over admitted prior art in view of Boos were dropped by the examiner in the final rejection mailed December 12, 1994. Accordingly, all arguments concerning such rejections are considered moot.

OPINION

We have carefully considered the claims and the respective positions articulated by the appellants and the examiner. As a consequence of our review, we will reverse the new matter rejection of claims 26 through 31, 33, 34, 36 through 44, 46, 47 and 52.

The examiner's position is that "[t]he original disclosure here said **absolutely nothing** about the 'resistivity' of the 'substrate'" (Answer, page 3). We agree that there is no explicit statement that the substrate "has a resistivity less than 10^3 ohm-cm." However, we disagree with the examiner that the addition of the substrate's resistivity is new matter.

In the specification (page 4, lines 29-30), "semi-insulating" is defined as having a resistivity of at least 10^3 ohm-cm. One can infer that semiconducting therefore must equate to having a resistivity less than 10^3 ohm-cm. Therefore, appellants clearly have support for the specific range of less than 10^3 ohm-cm for the resistivity of a semiconducting element.

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Further, appellants state (Specification, page 2, lines 1-2) that "[s]emi-insulating material is generally formed by suitably doping the desired III-V semiconductor material." Appellants continue with a description of the formation of semi-insulating gallium arsenide, which "involves introducing chromium as a dopant," and "chemical vapor deposition (CVD) growth in a gas transport system" (Specification, page 2, lines 6-9). The next paragraph (Specification, page 2, lines 32-33) begins, "[i]ndium phosphide has also been formed by a CVD process," and then describes the specifics of making semi-insulating indium phosphide by a gas transport system. Appellants conclude (Specification, page 3, lines 16-18) that "only chromium-based dopant precursors have been utilized to form semi-insulating indium phosphide." Thus, appellants imply that indium phosphide begins as semiconducting and becomes semi-insulating after suitable doping. Appellants' examples all begin with a "polished indium phosphide substrate" (Specification, page 8, line 21, page 10, line 5, and page 11, lines 29-31). Accordingly, appellants' substrates are semiconducting, which, as defined by appellants, means having a resistivity less than 10^3 ohm-cm.

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The examiner makes unsupported assertions (Answer, page 4) that "[t]he 'substrate' is an inert supporting body, and need not form any part of any 'active regions,'" and that "normally integrated circuit III-V devices, as the specification describes on page 3, are in fact formed on semi-insulating substrates, with 'active regions' (and insulating regions) formed over those semi-insulating substrates." However, the examiner fails to recognize that regardless of what integrated circuit III-V devices may "normally" use for substrates, the specification taken as a whole determines the type of substrate used in the instant application. As explained above, the combination of what is explicitly disclosed and the implications therefrom support a conclusion that appellants' substrate is in fact semiconducting and not "an inert supporting body."

To summarize, appellants indicate that semi-insulating regions are formed by doping semiconducting material. Appellants describe forming indium phosphide semi-insulating layers, thereby implying that indium phosphide is a semiconducting material. Appellants specify in the examples that the substrate is made of indium phosphide. As indium

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