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

Paper No. 44

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TOMOHIDE TERASHIMA and KAZUHIRO SHIMIZU

Appeal No. 2004-0581
Application No. 09/041,105

ON BRIEF

Before GARRIS, WALTZ, and TIMM, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 1-4 and 10-12. Claims 5, 8 and 9 have been allowed.

The subject matter on appeal relates to a semiconductor device having a separation structure for high withstand-voltage. With reference to Figure 1 of the appellants' drawing, a first embodiment of this device (see claim 1) comprises a p-type substrate, an n-type high density well 2, a p-type epitaxial region 3, an n-type low density well 4 and a p-type island 5,

wherein during certain loads of operation the n-type low density well 4 is fully depleted. With reference to Figure 8 of the appellants' drawing, a sixth embodiment of the device (see claim 10) comprises a p-type substrate 1, an n-type high density well 2, a p-type epitaxial region 3, an n-type low density well 4 and a left-behind portion of p-type epitaxial region 3a, wherein during certain modes of operation the n-type low density well 4 is fully depleted. This appealed subject matter is adequately illustrated by independent claims 1 and 10 which read as follows:

> 1. A semiconductor device having a separation structure for high withstand-voltage comprising:
>
> a first-conduction-type semiconductor substrate;
>
> a first region comprising a second-conduction-type well relatively high in impurity density, said second-conduction-type well being formed on a surface of said first-conduction-type semiconductor substrate;
>
> a first-conduction-type epitaxial region formed on said first-conduction-type semiconductor substrate above said second-conduction-type well; and
>
> a second region comprising a second-conduction-type well relatively low in impurity density, said second-conduction-type well being formed in said first-conduction-type epitaxial region at a depth to reach said second-conduction-type well relatively high in impurity density in an area including said first region wherein the second region extends substantially beyond an outer peripheral portion of the first region,

wherein during operation, the second conduction-type well relatively low in impurity density is capable of being depleted.

10. A semiconductor device having a separation structure for high withstand-voltage comprising:

a first-conduction-type semiconductor substrate;

a second-conduction-type well relatively high in impurity density, said second-conduction-type well being formed on a surface of said first-conduction-type semiconductor substrate;

a first-conduction-type epitaxial region formed on said first-conduction-type semiconductor substrate above said second-conduction-type well; and

a second-conduction-type well relatively low in impurity density, said second-conduction-type well being formed in said first-conduction-type epitaxial region at a depth to reach said second-conduction-type well relatively high in impurity density in an area including said second-conduction-type well relatively high in impurity density except for a predetermined portion above said second-conduction-type well relatively high in impurity density, wherein said second conduction type well relatively low in impurity density extends substantially beyond an outer peripheral portion of said second conduction type well relatively high in impurity density,

wherein during operation, the second conduction-type well relatively low in impurity density is capable of being depleted.

The references set forth below are relied upon by the examiner as evidence of obviousness:

Yoshioka et al. (Yoshioka)	4,314,268	Feb. 2, 1982
Akcasu	4,644,383	Feb. 17, 1987
Kihara et al. (Kihara)	5,286,986	Feb. 15, 1994
Shimizu et al. (Shimizu) (published Japanese Kokai Patent Application)	59-126662	Jul. 21, 1984

Claims 1, 3 and 4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshioka, and claim 2 is correspondingly rejected over this reference and further in view of Akcasu.

Claims 10 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shimizu, and claim 12 is correspondingly rejected over this reference and further in view of Kihara.

As indicated on page 4 of the brief, the appellants have grouped and argued separately only the independent claims on appeal. That is, none of the appealed dependent claims have been separately grouped and argued, not withstanding the fact that dependent claims 2 and 12 have been separately rejected by the examiner. It follows that, in assessing the merits of the above noted rejections, we need focus only on independent claims 1 and 10.

We refer to the brief and reply brief and to the answer for a thorough discussion of the respective positions advocated by the appellants and by the examiner concerning the rejections before us.

OPINION

We will sustain each of the Section 103 rejections advanced on this appeal for the reasons set forth below.

Although the examiner has based his rejection of appealed independent claim 1 on 35 U.S.C. § 103(a), the examiner's unpatentability position clearly is based on his determination that the Figure 6B semiconductor device of Yoshioka corresponds identically to the structure defined in appealed claim 1. While the examiner recognizes that the Yoshioka reference contains no disclosure regarding the "fully depleted" function recited in the last two lines of claim 1, it is apparent that the examiner considers patentee's Figure 6B device to be necessarily capable of performing this claimed function since its structure corresponds to the structure recited in claim 1. This position is expressed by the examiner on page 10 of the answer in the following manner:

> The examiner does not suggest to structurally modify Yoshioka[’s] device such that during certain modes of operation the second conduction type well relatively low in impurity density is fully depleted. Yoshioka[’s] structure is identical to the claimed structure. Thus, Yoshioka[’s] structure can also operate at high voltage, such that a RESURF occurs and the second conduction type well relatively low in impurity density is fully depleted [as required by appealed claim 1].

Significantly, the appellants do not dispute the examiner’s position that the semiconductor device of Yoshioka includes structural elements which correspond to each of the structural elements recited in claim 1. Instead, the only distinction urged by the appellants relates to the functional requirement of this claim. Under these circumstances, wherein the only alleged distinction between appealed claim 1 and Yoshioka involves the appellants’ claimed functional requirement, it was entirely appropriate for the examiner to take the position that Yoshioka’s device necessarily and inherently would possess the same functional characteristics as the here claimed device. *See In re Ludtke*, 441 F.2d 660, 664, 169 USPQ 563, 566-67 (CCPA 1971). The mere fact that Yoshioka contains no disclosure regarding this function does not defeat the examiner’s unpatentability determination. *See In re Schreiber,* 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). The identity of structural elements between Yoshioka’s device and the appellants’

claimed device adequately evinces the reasonableness of the examiner's belief that the functional limitation of claim 1 is an inherent characteristic of the prior art under consideration. *See Ex parte Skinner*, 2 USPQ2d 1788, 1789 (Bd. Pat. App. & Int. 1986).

We here remind the appellants that, while they are free to define their semiconductor device by what it does rather than by what it is (*In re Swinehart*, 439 F.2d 210, 212, 169 USPQ 226, 228 (CCPA 1971)), such a claim drafting technique carries the risk that the claim will not distinguish over the applied prior art. *Schreiber,* 128 F.3d at 1477-78, 44 USPQ2d at 1432. This is because of the long recognized authority possessed by the Patent and Trademark Office, under circumstances of the type before us in this appeal, to require an applicant to prove that the subject matter shown to be in the prior art does not actually possess the functional characteristic recited in the claim. *Id.* Moreover, whether the rejection is based on "inherency" under 35 U.S.C. § 102 or on "*prima facie* obviousness" under 35 U.S.C. § 103, the burden of proof is the same, and its fairness is evidenced by the inability of the Patent and Trademark Office to manufacture products or to obtain and compare prior art products. *See In re Best*, 562 F.2d 1252, 1254-55, 195 USPQ 430, 433-34 (CCPA 1977).

In light of the foregoing, it is our determination that the examiner has successfully shifted to the appellants the burden of proving that Yoshioka's Figure 6B device does not actually possess the functional characteristics required by appealed independent claim 1. Though couched in terms of obviousness considerations, arguments are presented by the appellants' attorney in the brief and reply brief to the effect that patentee's device would not be capable of performing the here claimed function. However, these arguments are proffered without evidentiary support. Further, these arguments do not include any explanation which reconciles the alleged functional incapability of the prior art device with the undisputed structural identity between the Yoshioka and claim 1 devices. For these reasons, we consider the arguments under consideration to possess little if any probative value. Concerning this matter, it is important to bear in mind that mere attorney arguments cannot take the place of factual evidence. *See In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972).

In light of the forgoing, it is our ultimate determination that the examiner has established a *prima facie* case of unpatentability in relation to appealed claim 1 which the appellants have failed to successfully rebut with argument and/or

evidence of patentability. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). It follows that we will sustain the examiner's Section 103 rejection of independent claim 1 and of nonargued dependent claims 3 and 4 as being unpatentable over Yoshioka. Analogously, we also will sustain the examiner's Section 103 rejection of nonargued dependent claim 2 as being unpatentable over Yoshioka in view of Akcasu.

Our foregoing analysis also applies to the examiner's Section 103 rejection of independent claim 10 as being unpatentable over Shimizu. On the record before us, the examiner has established and the appellants have not disputed that the structural elements of Shimizu's Figure 9 device correspond to the structural elements recited in claim 10. In this way, the examiner has established a reasonable basis for his belief that Shimizu's device necessarily and inherently possesses the same functional characteristics as the appellants' here claimed device. Thus, here, as before, the examiner has properly shifted to the appellants the burden of proving that the prior art device of Shimizu does not actually possess the functional characteristics in question. For reasons corresponding to those previously discussed, the appellants have failed to carry their burden of proof on the record of this appeal.

Therefore, we also will sustain the examiner’s Section 103 rejection of independent claim 10 and of nonargued dependent claim 11 as being unpatentable of Shimizu. Likewise, we will sustain the examiner’s Section 103 rejection of nonargued dependent claim 12 as being unpatentable over Shimizu in view of Kihara.

The decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

BRADLEY R. GARRIS Administrative Patent Judge	)	
THOMAS A. WALTZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
CATHERINE TIMM Administrative Patent Judge	)	

BRG/hh

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