Fed. Circ. Clarifies Enablement Requirement In LED Case

By **Scott Bornstein and Jonathan Wise** (August 22, 2018)

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On July 25, 2018, a unanimous three-judge panel at the United States Court of Appeals for the Federal Circuit issued a potentially far-reaching opinion on the application of enablement under 35 U.S.C. § 112, ¶ 1. The case at issue, Trustees of Boston University v. Everlight Electronics Co., involved Boston University's patent infringement allegations relating to a semiconductor device.[1] There was no question that the asserted claim had enablement support for five out of six permutations that fell within the scope of the claim.[2] The jury heard testimony, however, that the sixth permutation was not supported by the specification. Nevertheless, the jury rendered a verdict in favor of the patentee finding the patent valid and willfully infringed.[3]

The district court — noting that it would be unreasonable to require enablement of all six permutations — upheld the jury verdict and denied the defendants' motion for judgment as a matter of law on invalidity for lack of enablement.[4] In support of its decision, the district court held that "[n]either the parties nor the Court could find any cases requiring enablement of every possible permutation of every iteration."[5]

On appeal, the Federal Circuit reversed and held that support in the patent specification for five out of six permutations was not enough to satisfy the enablement requirement. Failure to provide enablement support in the specification at the time of the patent's effective filing date for all six permutations, i.e., for the full scope of the claim, rendered the claim invalid.[6]

Below, we summarize the key issues relating to the decision on enablement and identify some practical implications for patentees and patent litigants from the guidance provided by the Federal Circuit.

Case Background

In October 2012, Boston University sued Everlight and other companies for allegedly infringing U.S. Patent No. 5,686,738 by selling light emitting diodes and products that contain LEDs. The only claim that went to trial recites:

> A semiconductor device comprising:
>
> > a substrate, said substrate consisting of a material selected from the group consisting of (100) silicon, (111) silicon, (0001) sapphire, (11–20) sapphire, (1–102) sapphire, (111) gallium aresenide, (100) gallium aresenide, magnesium oxide, zinc oxide and silicon carbide;
> >
> > a non-single crystalline buffer layer, comprising a first material grown on said substrate, the first material consisting essentially of gallium nitride; and
> >
> > a growth layer grown on the buffer layer, the growth layer comprising gallium nitride and a first dopant material.[7]

The district court construed the phrases "a non-single crystalline buffer layer" and "grown on" following a Markman proceeding.[8] The term "a non-single crystalline buffer layer" was construed to mean "a layer of material that is not monocrystalline, namely, [1] polycrystalline, [2] amorphous or [3] a mixture of polycrystalline and amorphous, located between the first substrate and the first growth layer," which is consistent with how the inventor defined the term during prosecution of a related patent.[9] The district court then adopted Boston University's proposed construction that the phrase "grown on" means "formed indirectly or directly above."[10]

In view of the district court's claim construction, the enablement dispute centered around a single question: must all six permutations that fall within the scope of the claim be enabled? The six permutations included:

> (1) monocrystalline growth layer formed indirectly on a polycrystalline buffer layer; (2) monocrystalline growth layer formed indirectly on a buffer layer that is a mixture of polycrystalline and amorphous; (3) monocrystalline growth layer formed indirectly on an amorphous buffer layer; (4) monocrystalline growth layer formed directly on a polycrystalline buffer layer; (5) monocrystalline growth layer formed directly on a buffer layer that is a mixture of polycrystalline and amorphous; and (6) monocrystalline growth layer formed directly on an amorphous buffer layer.[xi]

The district court held that it would be unreasonable to require enablement of all six permutations in the claim scope and "concluded that the '738 patent did not have to enable a device with a monocrystalline growth layer formed directly on an amorphous buffer layer, as long as it enabled a device with a monocrystalline growth layer formed indirectly on an amorphous buffer layer."[12] Moreover, the district court determined that a reasonable jury could conclude that defendants failed to meet their burden to show that the claim was not enabled by clear and convincing evidence.[13]

The Federal Circuit reviewed the ultimate legal question of enablement de novo and reversed. The facts at trial — reviewed for substantial evidence — supported the defendants' contention that the specification of the '738 patent does not teach a "monocrystalline growth layer grown directly on an amorphous buffer layer."[14] In fact, Boston University could not direct the court to any part of the specification that teaches one of skill in the art how to grow a monocrystalline layer directly on an amorphous layer.[15] And, both sides' experts agreed that it is impossible to grow a monocrystalline layer directly on an amorphous layer using the specific methods described in the specification.[16] While Boston University's expert testified that he had grown a monocrystalline layer directly on an amorphous layer and others had done so as well, this work had been done after the effective filing date of the patent using methods not disclosed in the specification.[17] As such, the Federal Circuit ruled that the claim was invalid for lack of enablement and the post-filing work could not support enablement as of the effective filing date.[18]

Potential Implications for Patentees and Litigants

We believe that Trustees of Boston University provides guidance and practical considerations for patentees and patent litigants when initially filing their patent application and later during litigation, particularly at the claim construction stage.

Patentees (along with patent agents and attorneys) should be mindful of the permutations covered by their claim scope and the breadth of their specification. While the case at issue involved semiconductor technology limited to six possible permutations, the issues raised

are particularly relevant in fields where patentees include claims with limitations covering hundreds to thousands of possible permutations.

In the pharmaceutical field, for example, patentees often claim drug product formulations by reciting numerical "amounts" and "ranges," as well as "not more than" or "not less than" boundaries. This case suggests that, when using language that can cover multiple permutations, the specification must set forth sufficient detail so that a person of ordinary skill in the art can make and use all of those permutations at the time of the patent's effective filing date without undue experimentation. In other words, one need not explicitly discuss every permutation but such permutations need to be supported by the specification. In view of this guidance, when drafting claims and writing the specification, patentees should pay particular attention to outer boundaries recited to confirm at the patent's effective filing date that the specification through descriptions and examples, can support those permutations that fall within the broadest limits of the claim's scope.

The Trustees of Boston University decision also reminds patent litigants that their proposed constructions in Markman proceedings can have significant consequences. The Federal Circuit noted that Boston University's enablement problem may have been its own creation.[19] Boston University argued for and obtained a broad claim construction including "grown on" to mean "formed indirectly or directly above." The use of the word "or" thus doubled the number of permutations covered by the claim. While that broad construction may have been effective for Boston University's infringement position and allowed a jury to conclude that defendants willfully infringed the claim, it ultimately backfired at the Federal Circuit when the evidence showed that the full scope of the claim was not enabled. As such, patent litigants need to keep enablement in mind — and should consider it early when developing their litigation strategies — so that they do not overreach and obtain constructions covering permutations beyond what their specification can support.

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[1] Trustees of Boston University v. Everlight Electronics Co., Ltd., Nos. 16-2576, 16-2577, 16-2578, 16-2579, 16-2580, 16-2581, 16-2582, 16-2591, 16-2592, 16-2593, 16-2594, 16-2595, 2018 U.S. App. LEXIS 20713, at *5-6 (Fed. Cir. July 25, 2018).

[2] Id. at *14; Trustees of Boston University v. Everlight Electronics Co., Ltd., Nos. 12-11935, 12-12326, 12-12330, 2016 U.S. Dist. LEXIS 96024, at *7-8 (D. Mass. July 22, 2016) (memorandum and order denying judgment as a matter of law for invalidity based on lack of enablement).

[3] Trs. of Bos. Univ., 2016 U.S. Dist. LEXIS 96024, at *3.

[4] Id. at *10, 40.

[5] Id. at *8.

[6] Trs. of Bos. Univ., 2018 U.S. App. LEXIS 20713, at *2, 14-17.

[7] Id. at *5-6 (citing ’738 patent col. 7 l. 42-col. 8 l. 9 and emphasizing key claim limitations).

[8] Trs. of Bos. Univ. v. Everlight Elecs. Co., Ltd., 23 F. Supp. 3d 50, 58-63 (D. Mass. 2014) (memorandum and order on claim construction).

[9] Trs. of Bos. Univ., 2018 U.S. App. LEXIS 20713, at *6 (adding numbers in brackets for clarity); Trs. of Bos. Univ. 23 F. Supp. 3d at 62-63.

[10] Trs. of Bos. Univ., 2018 U.S. App. LEXIS 20713, at *6; Trs. of Bos. Univ. 23 F. Supp. 3d at 59-62.

[11] Trs. of Bos. Univ., 2018 U.S. App. LEXIS 20713, at *6-7.

[12] Id. at *7-8.

[13] Id. at *8.

[14] Id. at *9-11.

[15] Id. at *11-12.

[16] Id. at *10.

[17] Id. at *13.

[18] Id. at *13, 16-17.

[19] Id. at *17.