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Paper 6
Entered: November 2, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

TELEFONAKTIEBOLAGET LM ERICSSON,
Patent Owner.

IPR2022-00716
Patent 9,705,400 B2

Before NATHAN A. ENGELS, SHARON FENICK, and
STEPHEN E. BELISLE, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

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I. INTRODUCTION

A. Background

Apple Inc. ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1, 2, 8, 10, and 14 of U.S. Patent No. 9,705,400 B2 (Ex. 1001, "the '400 patent"). Paper 1, 1 ("Pet."). Petitioner also filed the Declaration of Dr. Marwan Hassoun in support of the Petition. Ex. 1006. Telefonaktiebolaget LM Ericsson ("Patent Owner") did not file a preliminary response.

An *inter partes* review may not be instituted unless it is determined that "the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314 (2018). For the reasons below, we determine the information presented in the Petition shows a reasonable likelihood that Petitioner will prevail in showing the unpatentability of at least one claim of the '400 patent, and we institute *inter partes* review.

B. Real Parties in Interest

Petitioner states that Apple Inc. is the real party in interest. Pet. 82. Patent Owner states that Telefonaktiebolaget LM Ericsson and Ericsson Inc. are the real parties in interest. Paper 3, 2.

C. Related Proceedings

The parties state that the '400 patent is the subject of *Ericsson Inc. et al. v. Apple Inc.*, No. 6:22-cv-00061 (W.D. Tex.) and *Ericsson Inc. et al. v. Apple Inc.*, 337-TA-1300 (ITC). Pet. 82; Paper 3, 2.

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D. The '400 Patent (Ex. 1001)

The '400 patent describes a circuit structure that includes an output stage that can be adapted to work with at least two subsystem circuit components such as a Class-D amplifier and a DC-DC boost converter. Ex. 1001, 1:44–56. As an example, the '400 patent states that a typical audio subsystem may combine in a single integrated circuit a Class-D amplifier for driving a circuit such as a hands-free loudspeaker. Ex. 1001, 1:11–23. The Class-D amplifier may be driven by a battery or by a DC-DC boost converter. Ex. 1001, 1:25–36. According to the '400 patent, in the prior art, such a configuration required two output stages, one output stage for the Class-D amplifier and a separate output stage for the DC-DC boost converter. Ex. 1001, 1:54–56.

Instead of an output stage dedicated for use with either a Class-D amplifier or a DC-DC boost converter, the circuit described in the '400 patent can operate in at least a first operating state and a second operating state, such that the output stage may be shared by at least two circuit components such as the Class-D amplifier and the DC-DC boost converter. Ex. 1001, 5:61–6:8.

E. Representative Claim

Of the challenged claims, claims 1, 8, and 14 are independent claims. Claim 1 is reproduced below.

> 1[p]. An output stage adapted to operate in at least a first operating state and a second operating state, the output stage comprising:
>
> [1(a)] a first, a second, a third and a fourth configurable input/output terminals; and,
>
> [1(b)] a first, a second, a third and a fourth switches, each having a first main terminal, a second main terminal and a control terminal, the control terminal being adapted to receive a

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control signal for controlling the open or closed state of the switch,

[1(c)(i)] wherein, the first input/output terminal is connected to the first main terminal of the first switch;

[1(c)(ii)] the second input/output terminal is connected to the first main terminal of the second switch;

[1(c)(iii)] the second main terminal of the first switch is connected to the first main terminal of the third switch through a first branch,

[1(c)(iv)] the second main terminal of the second switch is connected to the first main terminal of the fourth switch through a second branch;

[1(c)(v)] the third input/output terminal is connected to the first branch and the fourth input/output terminal is connected to the second branch;

[1(c)(vi)] the second main terminals of the third and fourth switches are both connected to a common node receiving a reference potential; and,

[1(c)(vii] wherein, when the first and second input/output terminals are configured to operate as input terminals, the third and fourth input/output terminals are configured to operate as output terminals; and,

[1(c)(viii)] when the first and second input/output terminals are configured to operate as output terminals, the third and fourth input/output terminals are configured to operate as input terminals; and,

[1(c)(ix)] wherein, in the first operating state, the output stage is arranged in a first electrical configuration; and

[1(c)(x)] in the second operating state wherein the output stage is arranged in a second electrical configuration different from the first configuration.

Ex. 1001, 12:2–42.

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F. Asserted Challenges to Patentability

Petitioner challenges the patentability of claims 1, 2, 8, 10, and 14 of the ’400 patent on the following grounds:

Claim(s) Challenged	35 U.S.C. §	References/Basis
1, 2, 8, 10	103[1]	Smith,[2]
14	103	Smith, Stengel[3]

Pet. 9.

II. DISCUSSION

A. Obviousness

Under 35 U.S.C. § 103, a claim is unpatentable as obvious if “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). We resolve the question of obviousness based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

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[1] The ’400 patent’s earliest priority date falls after the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), took effect. Thus, we apply the AIA version of § 103.
[2] WO 2010/111433 A2; Sept. 30, 2010. Ex. 1004.
[3] US 5,506,493; Apr. 9, 1996. Ex. 1005.

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