

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

SCRAMOGE TECHNOLOGY LTD.,
Patent Owner.

IPR2022-00573
Patent 7,825,537 B2

Before JAMESON LEE, KRISTINA M. KALAN, and MICHELLE N.
WORMMEESTER, *Administrative Patent Judges*.

WORMMEESTER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–22 and 28 of U.S. Patent No. 7,825,537 B2 (Ex. 1001, “the ’537 patent”). Scramoge Technology Ltd. (“Patent Owner”) filed a Preliminary Response (Paper 9). With our authorization provided in an e-mail dated June 22, 2022, Petitioner filed a preliminary Reply (Paper 10) to Patent Owner’s Preliminary Response, and Patent Owner filed a preliminary Sur-reply (Paper 11) to Petitioner’s preliminary Reply. Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review of all the challenged claims based on all the grounds presented in the Petition. Paper 12 (“Inst. Dec.”). Thereafter, Patent Owner filed a Response (Paper 17, “PO Resp.”) to the Petition, Petitioner filed a Reply (Paper 19, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 20, “PO Sur-reply”). On June 15, 2023, we conducted an oral hearing. A copy of the transcript (Paper 31, “Tr.”) is in the record.

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–22 and 28 of the ’537 patent are unpatentable.

II. BACKGROUND

A. *Related Proceedings*

The parties identify several federal district court cases, including *Scramoge Technology Ltd. v. Apple Inc.*, No. 6:21-cv-01071-ADA (W.D. Tex.). Pet. 80–81; Paper 29, 2 (Patent Owner’s Second Amended Mandatory Notices).

B. The '537 Patent

The '537 patent describes “inductively supplying electrical power.”
Ex. 1001, 1:6–8. To illustrate, Figure 1 of the '537 patent is reproduced
below.

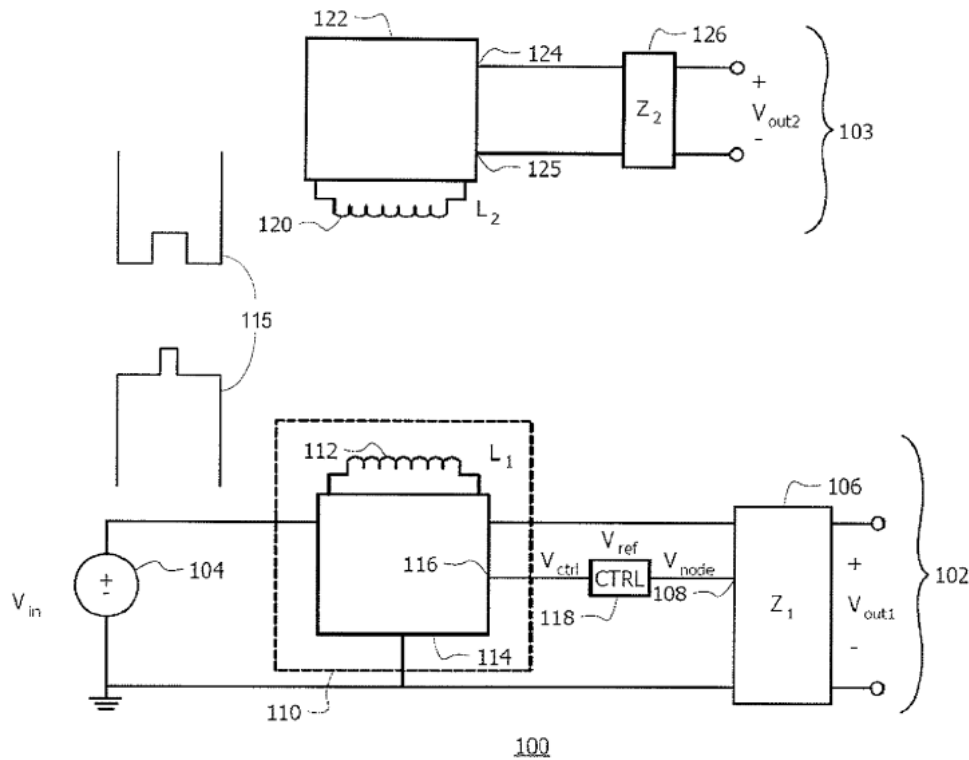


FIG. 1

Figure 1 shows inductive DC-DC converter circuit 100, which includes base unit 102 and target unit 103. *Id.* at 2:53–54, 3:22–27.

Base unit 102 includes DC voltage supply 104, which provides input DC voltage V_{in} . Ex. 1001, 3:31–33. Base unit 102 also includes load 106, which includes internal node 108. *Id.* at 3:33–34. DC voltage supply 104 and load 106 are electrically coupled through converter sub-circuit 110. *Id.* at 3:39–40. Converter sub-circuit 110 includes first inductive element 112 and switching network 114, which directs current to or from inductive element 112 at an operating frequency. *Id.* at 3:41–44. Switching

network 114 includes input node 116, which receives voltage signal V_{ctrl} . *Id.* at 3:45–48. Internal node 108 of load 106 and input node 116 of switching network 114 are electrically coupled through controller element (CTRL) 118, which monitors voltage V_{node} at node 108, comparing it to voltage V_{ref} , and adjusts voltage V_{ctrl} at node 116 based on the comparison. *Id.* at 3:48–53.

Target unit 103 includes second inductive element 120, rectifying element 122, and load 126. Ex. 1001, 3:61–4:6. Second inductive element 120 is electrically coupled to rectifying element 122. *Id.* at 3:61–66. Target unit 103 may be electrically coupled to an electronic device (e.g., battery, display unit, keypad) to provide power. *Id.* at 3:27–31.

In operation, first inductive element 112 serves as a primary coil for transferring power to target unit 103 via second inductive element 120, which serves as a secondary coil. Ex. 1001, 3:59–64. Second inductive element 120 generates a time-varying signal in response to coupling with first inductive element 112. *Id.* at 4:1–3. Rectifying element 122 generates a DC voltage signal between its node 124 and its node 125 for the time-varying signal generated by second inductive element 120. *Id.* at 3:65–4:3. The DC voltage can then be applied across second load 126 to produce output DC voltage V_{out2} . *Id.* at 4:3–6.

The '537 patent explains that to enhance power transfer efficiency, switching network 114 is used to adjust the operating frequency of first inductive element 112 until the oscillation of second inductive element 120 is induced at the self-resonant frequency. Ex. 1001, 4:20–42. The operating frequency of first inductive element 112 for inducing the self-resonant oscillation in second inductive element 120 can vary depending on the

separation between the two inductive elements as well as the configuration of rectifying element 122 and second load 126. *Id.* at 4:42–50.

C. Illustrative Claim

As noted above, Petitioner challenges claims 1–22 and 28 of the '537 patent, where claims 1, 12, and 28 are independent. Claim 1, reproduced below, is illustrative of the claims under challenge.

1. A method for inductively transferring power from a base unit providing input power, to a target unit providing output power, where the base unit and the target unit are electrically isolated, comprising:

positioning a second inductive element of said target unit within a predetermined distance of a first inductive element of said base unit;

applying a time varying electric current to said first inductive element to produce a time varying magnetic field, said time varying magnetic field induces an electric current in said second inductive element;

monitoring at least one parameter indicative of an efficiency of power transfer from said base unit to said target unit;

automatically adjusting at least one characteristic of said time varying electric current responsive to said parameter to maximize an efficiency of power transfer from said base unit to said target unit.

D. Asserted Grounds of Unpatentability

Petitioner challenges claims 1–22 and 28 of the '537 patent on the following six grounds. Pet. 6–76. We instituted *inter partes* review on all grounds presented in the Petition. Inst. Dec. 36.

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