

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INFINEON TECHNOLOGIES AG,
Petitioner,

v.

FEINICS AMATECH TEORANTA,¹
Patent Owner.

IPR2022-00650
Patent 9,633,304 B2

Before STACEY G. WHITE, BRIAN D. RANGE, and
JULIET MITCHELL DIRBA, *Administrative Patent Judges*.

RANGE, *Administrative Patent Judge*.

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

¹ Patent Owner is AmaTech Group Limited. Patent Owner's Mandatory Notice, Paper 5, 1.

I. INTRODUCTION

Infineon Technologies AG (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–3, 5–8, 11–14, and 16 (“the challenged claims”) of U.S. Patent No. 9,633,304 B2 (Ex. 1001, “the ’304 patent”). Paper 2 (“Pet.”). We instituted *inter partes* review of the challenged claims on all asserted grounds. Paper 12 (“Dec.”). After institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 16, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 19, “Sur-Reply”). An oral hearing was held on June 22, 2023, and a transcript of the hearing is included in the record (Paper 30, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This 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 1–3, 5–8, 11–14, and 16 of the ’304 patent are unpatentable.

II. BACKGROUND

A. *Related Matters*

The parties indicate that the ’304 patent is the subject of the following district court proceedings: *Smart Packaging Solutions SA v. CPI Card Group Inc.*, No. 1:21-cv-00556 (D. Del. 2021), and *Smart Packaging Solutions SA v. Perfect Plastic Printing Corp.*, No. 1:21-cv-00557 (D. Del. 2021). Pet. xvi; Paper 5, 2. Patent Owner further indicates that patents related to the ’304 patent are at issue in IPR proceedings in IPR2022-00235, *Infineon Technologies AG v. Feinics AmaTech Teoranta* (filed November 24, 2021) (U.S. Pat. No. 9,195,932 B2) and IPR2022-00417, *Infineon Technologies AG v. AmaTech Group Ltd.* (filed January 10, 2022) (U.S. Pat. No. 9,033,250 B2). Paper 5, 3. We also note that in IPR2022-00951, petition

filed April 29, 2022, Petitioner challenges claims of related U.S. Patent No. 9,165,240 B2.

B. The '304 patent

The '304 patent is titled "Booster Antenna Configurations and Methods." Ex. 1001, code (54). Generally, the '304 patent describes a booster antenna for a smart card. *Id.* at code (57). We reproduce Figures 1 and 1A of the '304 patent below.

FIG. 1

Dual Interface (DI) Smart Card, and Readers

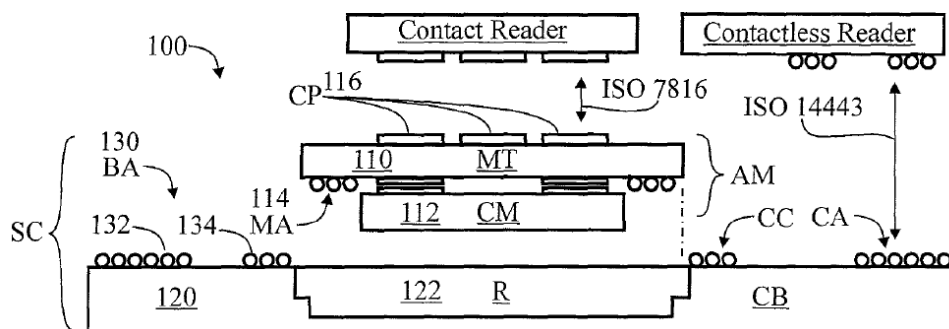


FIG. 1A

different areas of the Card Body (CB)

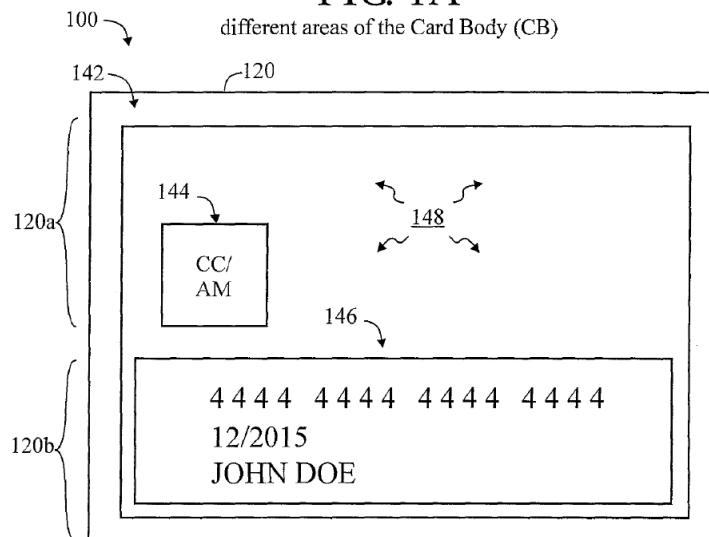


Figure 1 is a cross-section of a dual-interface smart card and reader and Figure 1A is the top view of a smart card's card body (CB). *Id.* at 7:35–38. A smart card may comprise card body (CB) (120) that has coupling area (144) in the location of antenna module (AM), and booster antenna (BA) (130). *Id.* at 1:63–2:1, 10:10–28. Antenna module (AM) may comprise a module tape (MT) or an RFID (radio frequency identification) chip or chip module. *Id.* at 1:65–2:4, 10:12–18. Booster antenna (BA) (130) may comprise various antenna components, such as card antenna (CA) (132) for coupling with an external contactless reader, and coupling coil (CC) (134) for coupling with module antenna (MA) (114) of antenna module (AM). *Id.* at 2:4–8, 10:23–27.

We reproduce '304 patent Figure 4B below.

FIG. 4B

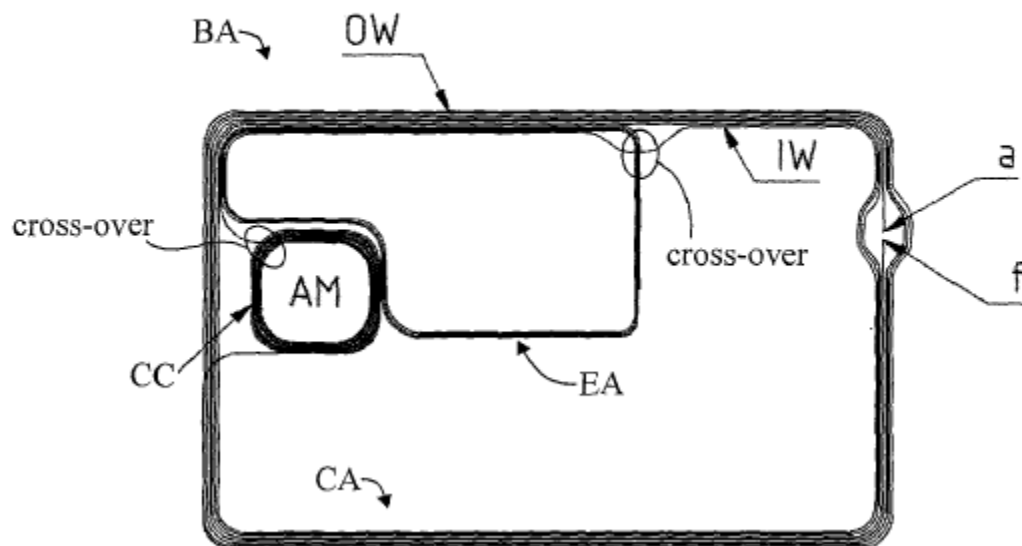


Figure 4B illustrates an embodiment of a booster antenna (BA) with card antenna (CA), a coupler antenna (CC), and an extension antenna (EA). *Id.* at 7:52–54. The booster antenna BA may be formed from “one, continuous”

wire laid in a pattern to form several coils that the '304 patent characterizes as the card antenna CA, coupler antenna CC, and extension antenna EA. *Id.* at 18:9–14. The coupler antenna CC may encircle or nearly encircle the antenna module AM for inductively coupling. *Id.* at 16:66–17:5. The extension antenna may serve to “increase the inductivity of the booster antenna BA while reducing its resonance frequency.” *Id.* at 17:52–60.

The '304 patent describes a prior art reference, “U.S. Patent No. 8,130,166 (Assa Abloy, 2012)” as disclosing a “coupling device for transponder and smart card with such device.” *Id.* at 3:38–40. Petitioner explains that the “Assa Abloy” reference is the patent that issued from the application that Petitioner refers to as Ayala-362. Pet. 6; *see also* Ex. 1012 (the “Assa Abloy” patent); Ex. 1006 (the Ayala-362 patent application). The '304 patent explains that this prior art device had a small spiral and large spiral where “the small spiral shows a larger pitch than the ones of the large spirals.” Ex. 1001, 3:40–49. The '304 patent explains that Assa Abloy teaches choosing the pitches of spirals as follows:

The pitches of the large spirals are chosen such as that the interturn stray capacitances is important and that the large spirals have mainly a capacitive behavior. And the pitch of the small spiral is chosen such as that the interturn stray capacitances are negligible, and that the small spiral has mainly an inductive behavior.

Id. at 3:49–54; *see also id.* at 26:7–22 (distinguishing Assa Abloy); Ex. 1006, code (57) (Ayala-362 abstract providing a similar explanation).

The '304 patent teaches that at least one of its components “may have a pitch which is different than one or more of the other components.” Ex. 1001, code (57). Figure 6A (not reproduced here) states that “pitch increases across width of card body (CB).” *Id.* at Fig. 6A. The '304 patent

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