

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.

Petitioner

v.

CARUCEL INVESTMENTS, L.P.

Patent Owner

Case No. IPR2019-01102

U.S. Patent No. 7,848,701

**PATENT OWNER'S REQUEST FOR REHEARING
UNDER 37 C.F.R. § 42.71(d)**

TABLE OF CONTENTS

I. INTRODUCTION	1
II. LEGAL STANDARD	1
III. ARGUMENT.....	2
A. The Final Written Decision Overlooks and Misapprehends Patent Owner’s Evidence and Arguments.....	2
1. The Specification of the ‘701 Patent Requires a “Mobile Device” To Register with the Cellular Network.....	3
2. The Specification of the ‘701 Patent Teaches that a “Mobile Device” Must Be Capable of Directly Communicating with the Cellular Network via a Fixed Base Station.....	4
3. The Specification of the ‘701 Patent Exclusively Relates to Mobile Devices Within Cellular Telephone Systems.....	7
4. The Specification of the ‘701 Patent Does Not Include Non-Cellular Embodiments	10
5. The Challenged Claims of the ‘701 Patent	12
6. The File History of the Related ‘904 Patent.....	14
B. Each of Petitioner’s Grounds Fail under the Proper Construction of “Mobile Device”	15
IV. CONCLUSION	15

TABLE OF AUTHORITIES

Cases

<i>Arnold P'ship v. Dudas</i> , 362 F.3d 1338, 1340 (Fed. Cir. 2004)	1
<i>Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc.</i> , 262 F.3d 1258, 1268-69, 1271 (Fed. Cir. 2001)	3
<i>Lexion Med., LLC v. Northgate Techs., Inc.</i> , 641 F.3d 1352, 1356 (Fed. Cir. 2011)	2
<i>On Demand Mach. Corp. v. Ingram Indus.</i> , 442 F.3d 1331, 1340 (Fed. Cir. 2006)	14

Other Authorities

37 C.F.R. § 42.71(c)	2
37 C.F.R. § 42.71(d)	1

I. INTRODUCTION

Pursuant to 37 C.F.R. § 42.71(d), Patent Owner, Carucel Investments L.P., respectfully requests rehearing of the Board’s Final Written Decision (Paper 28, “FWD”) determining all challenged claims, namely claims 10, 15–18, 31, and 33–35, of U.S. Patent No. 7,848,701 (the “’701 Patent”), unpatentable.

Patent owner respectfully requests a rehearing on the basis that the Final Written Decision misapprehends and overlooks (1) the proper scope of the term “mobile device”¹ by disregarding the substantial evidence and arguments set forth by Patent Owner in its Response (Paper 12) and its Sur-Reply (Paper 23); and (2) under the proper construction of “mobile device” that each of Petitioner’s prior art references do not disclose the limitation of “mobile device” as required by the Challenged Claims of the ’701 Patent.

II. LEGAL STANDARD

On rehearing, the Board reviews its decisions for an abuse of discretion. *See* 37 C.F.R. § 42.71(c). An abuse of discretion may be found if a decision is based on an erroneous interpretation of law, if a factual finding is not supported by substantial evidence, or if the decision represents an unreasonable judgment in weighing relevant factors. *See Arnold P’ship v. Dudas*, 362 F.3d 1338, 1340 (Fed. Cir. 2004).

¹ For the reasons set forth herein, the Board improperly concluded that “that no construction of ‘mobile device’ is necessary.” FWD at 21.

III. ARGUMENT

A. The Final Written Decision Overlooks and Misapprehends Patent Owner's Evidence and Arguments

As set forth in the POR, Patent Owner proposed that the construction of the term “mobile device” is “a device that must register with and be able to directly communicate with the cellular network.”² In contrast, Petitioner did not submit any construction of the term “mobile device” within its Petition; instead, Petitioner only broadly construed the meaning of “mobile device” in the abstract within its Reply.³

Although the Final Written Decision does not adopt any explicit construction for the term “mobile device,” the Decision rests upon the implicit conclusion that “non-cellular devices”—such as conventional cordless phones—fall within the scope of the term “mobile device(s)” when viewed in the context of the ’701 Patent. *See* FWD at 10-21. However, the Board’s overly broad and implicit interpretation of the term “mobile device” is not supported by the record.

For these reasons, as explained in detail below, Patent Owner respectfully submits that the Final Written Decision misapprehends and overlooks the proper scope of the term “mobile device” by improperly disregarding at least Patent

² *See* POR at 13-16.

³ *See* Paper 19, Reply at 4-9. *But see* *Lexion Med., LLC v. Northgate Techs., Inc.*, 641 F.3d 1352, 1356 (Fed. Cir. 2011).

Owner’s proposed construction of “mobile device” and the ‘701 Patent’s explicit support for this proposed construction.⁴

1. The Specification of the ‘701 Patent Requires a “Mobile Device” To Register with the Cellular Network

The Board erred in finding that the ‘701 Patent does not require a “mobile device” to register with the cellular network. *See* FWD at 20. The record does not support the Board’s conclusion. Critically, the Board’s analysis misapprehends and overlooks the proper scope of the term “mobile device” by improperly disregarding substantial evidence within the specification of the ‘701 Patent—requiring the “mobile device” to register with the cellular network:⁵

- “When a mobile unit set is first powered up or first enters a service area, the mobile unit **must register** in the manner described earlier, **by transmitting its unique address in the new service area**. The address will be received by the closest moving base station 30 and transmitted via a fixed radio port and the gateway switch 60 to the telephone network. **This registration procedure is required so that an incoming call for the mobile unit can be appropriately directed.**” Ex. 1001, 9:49-56.

⁴ *But see Bell Atlantic Network Services, Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1268-69, 1271 (Fed. Cir. 2001) (“[T]he written description can provide guidance as to the meaning of the claims . . . even if the guidance is not provided in explicit definitional format.”).

⁵ *See* POR at 7-8, 13-16; Ex. 2100, ¶¶ 57, 66; Sur-Reply at 2-3.

In order to obtain the benefits of the '701 Patent—while moving through various cells of the cellular network (i.e., from one service area to another service area)—the '701 Patent discloses that a “mobile device” must register once it enters the new service area.⁶ As Mr. Lanning explains, the purpose of the registration procedure is to provide the physical location of the mobile device to the cellular network.⁷ Without the physical location of the mobile device—via the registration procedure—the mobile device is inoperable because it unable to send outgoing calls or receive incoming calls while moving from one service area (i.e., a network cell) to another.⁸

For the foregoing reasons, the Board’s finding improperly misapprehends and overlooks substantial evidence within the record, including the specification of the '701 Patent— requiring the “mobile device” to register with the cellular network.

2. The Specification of the '701 Patent Teaches that a “Mobile Device” Must Be Capable of Directly Communicating with the Cellular Network via a Fixed Base Station

⁶ Patent Owner notes that non-cellular devices do not register with a cellular network. *See* POR at 6, 15; Ex. 2100, ¶¶ 66. *See also* Paper 27 at 69:15-18. This fact further contradicts the Board’s finding that the term “mobile device” includes “non-cellular devices, such as radios and telephones.” FWD at 20.

⁷ *See* POR at 7-8; Ex. 2100, ¶57. *See also* Paper 27, at 84:6-18.

⁸ *See* Ex. 1001, 9:54-56 (“This **registration procedure is required** so that an incoming call for the mobile unit can be appropriately directed.”).

The Board erred in finding that the '701 Patent does not teach that a “mobile device” must be capable of directly communicating with a cellular network via fixed base station. *See* FWD at 14. The record does not support the Board’s conclusion. Once again, the Board’s analysis misapprehends and overlooks the proper scope of the term “mobile device” by improperly disregarding the specification of the '701 Patent—requiring the “mobile device” to be capable of directly communicating with a cellular network via fixed base station:⁹

- “In one particular embodiment, a number of fixed base stations are provided in addition to moving base stations **allowing slower moving traffic**, such as pedestrian traffic [outside of vehicle] or rush hour mobile traffic [inside of vehicle] **to communicate via the fixed base stations.**” Ex. 1001, 3:15-19.
- “In the arrangement of FIG. 1, **fixed base stations 70 would accommodate communications with mobile units** traveling at a speed of less than 30 miles per hour including pedestrian traffic and stationary units.” *Id.*, 4:46-49.
- “The **fixed base stations 70** are preferably each provided with four antennas 102-105 In the configuration of FIG. 1, the antennas 102 [of the fixed base stations 70] are arranged **to communicate with the mobile units 20**” *Id.* 5:20-33.

⁹ *See* POR at 7-8, 13-16; Ex. 2100, ¶¶ 49-56.

- “In congested traffic areas, **a mobile unit which is stopped or slowly moving**, e.g., less than 30 miles per hour, **will preferably be serviced by one of the fixed base stations 70.**” *Id.* 10:52-55.
- “Each **mobile unit** monitors pilot signals **from fixed** and moving **base stations** and **synchronizes to the base station** providing the best signal.” *Id.* 10:65-67.

This capability of the “mobile devices”¹⁰ is supported by the fact that the ‘701 Patent further discloses that the “mobile devices” are also capable of being switched back-and-forth between either a direct connection with the fixed base station or a connection with a moving base station:¹¹

- “In the arrangement of FIG. 1, **fixed base stations 70 would accommodate communications with mobile units traveling at a speed of less than 30 miles per hour including pedestrian traffic and stationary units.** It will be readily apparent that instead of having fixed and moving base stations as

¹⁰ Patent Owner notes that non-cellular devices are not capable of directly communicating with the cellular network via a fixed base station. *See* POR at 6, 14; Ex. 2100, ¶66. *See also* Paper 27 at 69:15-18. This fact further contradicts the Board’s finding that the term “mobile device” includes non-cellular devices.

¹¹ *See* POR at 8, 13-14; Ex. 2100, ¶¶ 55-57. Non-cellular devices are also not capable of this capability taught by the specification of the ‘701 Patent. *Id.*

depicted in FIG. 1, slowly moving and rapidly moving units may be used as well.” Ex. 1001, 4:46-52.

- “As the speed of travel of the mobile unit 20 increases, a handoff will occur between the fixed base station and a moving base station. The procedures for determining whether a mobile unit is to be served by a fixed base station or a moving base station are the same procedures as described earlier herein . . . i.e., based on signal strength and error rate. Thus, when a call involving a mobile unit is initiated or when it is determined that a handoff should occur, the mobile unit may be handed from a moving station to a fixed station, or vice versa. *Id.*, 10:55-65.
- “The mobile unit may ‘connect’ with three fixed or moving base stations while searching for a fourth in what is known as the ‘soft’ hand-off mode. *Id.* 10:67-11:3.

For the foregoing reasons, the Board’s finding improperly misapprehends and overlooks substantial evidence within the record, including the specification of the ‘701 Patent—requiring the “mobile device” to be capable of directly communicating with a cellular network via fixed base station.

3. The Specification of the ‘701 Patent Exclusively Relates to Mobile Devices Within Cellular Telephone Systems

The Board erred in finding that the ‘701 Patent does not “exclusively relate[] to improving the wireless connections of mobile devices within ‘cellular telephone

systems.” FWD at 20. However, the Board’s overly broad interpretation of the scope of the invention is not supported by and is contrary to the specification of the ‘701 Patent. Indeed, the Board’s analysis misapprehends and overlooks vital “cellular” disclosures in the specification of the ‘701 Patent with respect to its analysis regarding the scope of the invention:¹²

- “The invention relates to **cellular telephone systems** . . . and more particularly to **cellular telephone systems adapted for use with fast-moving mobile units**.” Ex. 1001, 1:17-21. *See also id.*, at 1:25-3:14; 4:61-67; 9:3-6.
- “Modern **cellular systems** use what is known as code division multiple access (CDMA) spread-spectrum communications.” *Id.*, 2:14-16. *See also id.*, 7:22-26 (“U.S. Pat. No. 5,103,459 entitled “System and Method for **Generating Signal Wave Forms in CDMA Cellular Telephone System**” is incorporated by reference herein.”); 9:18-48.
- “For the examples herein, the radio interface **between the mobile units 20, 25 and the moving base stations 30, 40 and the fixed base station 70 is a standard radio interface**, well known in the art.” *Id.*, 6:37-39.

¹² *See* POR at 2-6; Sur-Reply at 5-6; Ex. 2100, ¶¶49-70; Paper 27, 142:4-8, 142:18-144:6.

- “In accordance with this invention, the fixed radio ports are synchronized and the interface between the moving base station and the fixed radio ports is a **time division multiplexed (TDM)-direct-sequence, spread-spectrum CDMA**.” *Id.*, 3:10-14. *See also id.*, at 6:39-43.
- “The interface between the mobile unit and the movable base may be the **standard IS-95**-based PCS air interface standard.” *Id.*, 6:59-61.

The '701 Patent specification describes that the interface between all components of the invention (i.e., the fixed base station, the moving base station, and the mobile device) is a “**standard radio interface**.” *See, e.g.*, Ex. 1001, 6:37-39. More importantly, the '701 Patent specification provides **only cellular** exemplary standard radio interfaces: “TDM/CDMA”¹³ and “IS-95.”¹⁴ As Petitioner concedes, the IS-95 Standard was **the cellular standard** at the time of the invention in 1995 “**that enabled mobile devices to register with and directly communicate with a cellular network**.” *See* Reply at 20. Critically, non-cellular devices cannot even utilize the exemplary IS-95 cellular standard set forth in the '701 Patent, let

¹³ Paper 32, 138:16-21.

¹⁴ *See* Sur-Reply at 4-6. As explained by Patent Owner’s counsel during the Oral Hearing, “Wi-Fi” and “Bluetooth” did **not** exist in 1995 and, thus, would not be considered a “standard radio interface” by a POSITA at the time of the invention. *See* Paper 32, 137:12-138:6; 141:1-3.

alone any other known cellular interface standard (e.g., AMPS or GSM).¹⁵ This fact further contradicts the Board’s finding that the term “mobile device” includes non-cellular devices.

For the foregoing reasons, the Board’s finding improperly misapprehends and overlooks substantial evidence within the record, including the specification of the ’701 Patent—exclusively relating to improving the wireless connections of mobile devices within cellular telephone systems.

4. The Specification of the ’701 Patent Does Not Include Non-Cellular Embodiments

The Board erred in finding that the ’701 Patent “improv[es] wireless connections involving non-cellular devices, such as radios and telephones” by relying on a misapprehension of various excerpts within the ’701 Patent specification. *See* FWD at 15-22.

For example, the Board’s reliance on the first excerpt—containing the words “cordless phone”—is misplaced because it misapprehends at least the ’701 Patent specification. *See* FWD at 15. When viewed in its entirety, this excerpt does not mean that the scope of the ’701 Patent includes non-cellular devices.¹⁶ In stark contrast,

¹⁵ *See* POR at 6; Ex. 2100 ¶¶65, 70. *See also* Exs. 1011 & 1012 (describing the AMPS cellular system); Ex. 1013 (describing the GSM cellular system).

¹⁶ Indeed, this excerpt would **exclude** a “cordless phone” as a “mobile device” since a cordless phone cannot be used in shopping malls, airports, or in cars on expressways at highway speeds. *See, e.g.*, POR at 1-6; Ex. 2100, 62-66. *See also* Paper 27 at 69:15-18.

this excerpt actually emphasizes that an invention was needed where the same mobile device—being used at either the home or office—is also able to communicate in all other types of situations and locations (i.e., “streets, in shopping malls, airports, etc., and in cars on expressways at highway speeds.”). Put simply, this excerpt highlights that the mobile device could be used in the home or office **like** a cordless phone—as would be well understood at the time of the invention in 1995. Therefore, this excerpt actually supports Patent Owner’s proposed meaning of “mobile device” since a **cellular system** is the only system that can facilitate communication to the same mobile device in **all of the exemplary applications** set forth in the ‘701 Patent specification.¹⁷

Likewise, the Board’s reliance on the second excerpt—related to a “standard radio interface” between the mobile unit and the moving base station—is also misplaced because it misapprehends at least the ‘701 Patent specification. *See* FWD at 15. As previously discussed, the specification of the ‘701 Patent provides **only cellular** exemplary “standard radio interfaces”—namely, “TDM/CDMA” (between the fixed base station and the moving base station) and the cellular “IS-95 standard” (between the moving base station and the mobile device).¹⁸

¹⁷ *See supra* Section III.A.3.

¹⁸ *See* Ex. 1001, 6:37-39; 6:39-43; 6:59-61. *See also* Sur-Reply at 5 (“[T]he ‘701 Patent explicitly and exclusively relates to improving the wireless connections of mobile devices within ‘cellular telephone systems.’”).

Finally, the Board’s reliance on the third excerpt—related to a “eliminating any direct communication from the mobile unit to the fixed radio port”—is also misplaced. *See* FWD at 12. When viewed in its entirety, this excerpt relates to signal power levels within the “**specific embodiment**” that is limited to the fast-moving mobile device solely communicating with the movable base station.¹⁹ More importantly, the mobile device still possess the capability to directly communicate with the cellular network via a fixed base station even in this specific embodiment.²⁰ This is because the same mobile device would ultimately be required to directly communicate with the cellular network via a fixed base station, if and when the mobile device “travel[es] at a speed of less than 30mph . . . or [even becomes] stationary” as disclosed by the ’701 Patent.²¹

For the foregoing reasons, the Board’s finding misapprehends various excerpts within the ’701 Patent specification that do not support and, ultimately, contradict its finding, when the cited excerpts are viewed in their entirety.

5. The Challenged Claims of the ’701 Patent

Finally, the Board erred in finding that “that the language of the challenged claims does not support Patent Owner’s construction” by relying on a

¹⁹ *See* Ex. 1001, 3:20-35. *See also* Ex. 1001, 9:22-48; Fig. 8.

²⁰ *See* POR at 7-8, 13-14; Ex. 2100 ¶¶52-56.

²¹ Ex. 1001, 4:47-49; 10:52-65; 10:65-11:4.

misapprehension of the scope and its advantages²² set forth by the ‘701 Patent. *See* FWD at 19. For example, the fact that the claims of the ‘701 Patent require the apparatus/movable base station to communicate directly with the cellular network (and not the “mobile device”) is not surprising since the invention is directed towards **improving the wireless connections of mobile devices** within cellular telephone systems **via a movable base station** that is interposed between the mobile devices and the base stations of a cellular network.²³ Indeed, the movable base station addressed the handoff problems and data bandwidth constraints of conventional consumer cellular networks in 1995, by reducing the vast number of handoffs required for multiple mobile devices²⁴ to only one handoff between the network and the movable base station for all the connected mobile devices.²⁵ As a result, the

²² As set forth in at least the POR, the **advantage** of the ‘701 Patent is the improvement of the wireless connections **for “mobile devices”** by providing **these “mobile devices”** with higher bandwidths and improved service quality in all locations and situations. *See* POR at 3-5. *See also* Paper 27, 96:20-22 (“The primary thrust of the Carucel patents is to improve the operation of standard cellular devices by means of a moving base station.”); 84:1-4.

²³ *See* POR at 2-5. *See also* Paper 27, 83:19-84:4.

²⁴ Patent Owner notes that non-cellular devices do not perform any handoffs within cellular networks. *See* POR 13-14. *See also* Paper 27 at 69:15-18; 141:19-21; Ex. 1003, ¶47 (“As previously explained, hand-offs occur when ‘a mobile unit **moves through a cellular network** ... away from one cell site and toward another cell site.”).

²⁵ Conventional consumer cellular networks were burdened with processing handoffs for **each** mobile device as they moved through cells of a cellular network. *See* POR at 4-5. This burden further increased as the travel speed of each mobile

movable base station enabled higher bandwidths and improved service quality **for “mobile devices”**,²⁶ thereby allowing greater access to modern day applications.²⁷

For the foregoing reasons, the Board’s finding improperly misapprehends the proper scope of the ’701 Patent —directed exclusively towards cellular devices—and its advantages—directed towards the “mobile device”—as set forth in the specification.

6. The File History of the Related ’904 Patent

Finally, the Board erred in finding that “according to the prosecution history [of the related ’904 Patent, the term “mobile device”] can be **conventional radios and telephones**” by relying on a misapprehension of the ’904 Patent’s file history. *See* FWD at 16. This is not supported by the record. For example, the prosecution history of the ’904 Patent does **not** even use the term “conventional” in the “summary of the invention.”²⁸ More importantly, the appellant only described a brief

device increased as they moved across various cells—resulting in dropped connections, interruptions, and poor service. *Id.*

²⁶ “[W]hen the scope of the invention is clearly stated in the specification, and is described as the advantage and distinction of the invention, it is not necessary to disavow explicitly a different scope.” *On Demand Mach. Corp. v. Ingram Indus.*, 442 F.3d 1331, 1340 (Fed. Cir. 2006). *See* Sur-Reply at 4-5.

²⁷ Indeed, both increased bandwidth and service quality are hallmarks of modern cellular communications, allowing for many high bandwidth applications that are widely used today **by cellular mobile devices**, but did not exist at the time of the invention back in 1995. *See* POR at 3-4.

²⁸ *See* Ex. 1023 at 181.

summary of the invention, and **not** a definition for the term “mobile device.”²⁹ Indeed, this generalized reference to “telephones and other radio modems” is to be viewed in the context of the requirements of “mobile device” set forth in ’701 Patent specification.³⁰

B. Each of Petitioner’s Grounds Fail under the Proper Construction of “Mobile Device”

Under the proper construction of the term “mobile device” proposed by Patent Owner, the record establishes that Petitioner failed to show by a preponderance of the evidence that the prior art references disclose or render obvious the “mobile device” limitation of the Challenged Claims.³¹

IV. CONCLUSION

For the foregoing reasons, Patent Owner respectfully submits that rehearing is necessary to address the foregoing issues misapprehended and/or overlooked by the Board in its Final Written Decision.

Date: December 6, 2020

Respectfully submitted,

/s/ R. Scott Rhoades

R. Scott Rhoades

Reg. No. 44,300

²⁹ See Sur-Reply at 4-7. See also Paper 27, at 88:21-89:2; 149:3-8; 149:16-150:4.

³⁰ See *supra* Section III.A.1 – III.A.2. See also Paper 27, at 87:22-88:12.

³¹ See POR at 41-43, 49-50; Sur-Reply at 17-22, 28-33. See also Ex. 1040, 359:9-362:6.

**CERTIFICATE OF COMPLIANCE WITH PAGE
LIMITATION OF 37 C.F.R. § 42.24(d)**

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that Patent Owner's Request for Rehearing complies with the page limits of 37 C.F.R. § 42.24(a)(1) as it contains no more than 15 pages, excluding the parts of this Patent Owner's Request for Rehearing that are exempted by 37 C.F.R. § 42.24(a)(1).

Date: December 6, 2020

Respectfully submitted,

/s/ R. Scott Rhoades

R. Scott Rhoades

Reg. No. 44,300

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), the undersigned certifies that an electronic copy of the foregoing PATENT OWNER'S REQUEST FOR REHEARING was served on the Petitioners by electronic mail on December 6, 2020:

rrichardson-PTAB@sternekessler.com,
lschleh-PTAB@sternekessler.com,
mspecht-PTAB@sternekessler.com,
dyonan-PTAB@sternekessler.com, and
PTAB@sternekessler.com.

Respectfully submitted,

/s/ R. Scott Rhoades

R. Scott Rhoades

Reg. No. 44,300