

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,
SAMSUNG ELECTRONICS AMERICA, INC., and
GOOGLE LLC,
Petitioner,

v.

HEADWATER RESEARCH LLC,
Patent Owner.

Case IPR2024-00341
Patent 8,406,733

PETITIONERS' REPLY TO PATENT OWNER'S RESPONSE

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LISTING OF EXHIBITS

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EX-1001	U.S. Patent No. 8,406,733 to Raleigh (“the ’733 Patent”)
EX-1002	Excerpts from the Prosecution History of the ’733 Patent (“the Prosecution History”)
EX-1003	Declaration and Curriculum Vitae of Dr. Patrick Traynor
EX-1004	3GPP TS 23.140 v6.9.0 (2005-03); 3rd Generation Partnership Project; Technical Specification Group Terminals; Multimedia Messaging Service (MMS); Functional Description; Stage 2 (“TS-23.140”)
EX-1005	U.S. Pat. No. 8,195,961B2 (“Ogawa”)
EX-1006	RESERVED
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EX-1008	PCT Pat. App. Pub. No. WO 2008/048075A1 (“Lee”)
EX-1009	U.S. Pat. No. 7,975,147B1 (“Qumei”)
EX-1010	U.S. Pat. No. 9,032,192B2 (“Frank”)
EX-1011	“Open Mobile Alliance; OMA-ERELDMMS-v1_2-20030923- C, Enabler Release Definition for MMS Version 1.2,” available at https://www.openmobilealliance.org/release/MMS/V1_2-20030923-C/OMA-ERELDMMS-V1_2-20030923-C.pdf
EX-1012	“Open Mobile Alliance; Multimedia Messaging Service Architecture Overview” (MMSARCH) specification, available at https://www.openmobilealliance.org/release/MMS/V1_2-20030923-C/OMA-MMS-ARCH-V1_2-20030920-C.pdf
EX-1013	The Secure Sockets Layer (“SSL”) Protocol, V. 3.0, available at https://web.archive.org/web/19970614041044/http://home.netscape.com/eng/ssl3/ssl-toc.html and https://web.archive.org/web/19970617034012/http://home.netscape.com/eng/ssl3/3-SPEC.HTM#1
EX-1014	The Transport Layer Security (“TLS”) Protocol, V. 1.1, available at https://www.ietf.org/rfc/rfc4346.txt
EX-1015	U.S. Pat. App. Pub. No. 2003/0096625 (“Mi-Su Lee”)
EX-1016	RESERVED
EX-1017	RESERVED
EX-1018	Liaison Statement, European Telecommunications Standards Institute AT-F Rapporteur Meeting, 4 to 6 February 2003 (ETSI

Exhibit	Description
	/ AT-F TD18), available at https://www.3gpp.org/ftp/tsg_sa/TSG_SA/TSGS_19/Docs/PDF/SP-030167.pdf
EX-1019	RESERVED
EX-1020	USPTO Binding Interim Guidance Addressing PTAB’s Approach to Discretionary Denials, June 21, 2022, available at https://www.uspto.gov/sites/default/files/documents/interim_procedure_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf
EX-1021	Plaintiff Headwater Research LLC’s Disclosure of Asserted Claims And Infringement Contentions, Headwater Research LLC v. Samsung Electronics Co., 6:23-cv-00103-JRG-RSP (WDTX)
EX-1022	Docket Control Order , 2:23-CV-00103-JRG-RSP, [63] December 1, 2023
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EX-1024	Declaration of Friedhelm Rodermund
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EX-1026	U.S. Patent No. 7,509,487 to Lu et al. (“Lu”)
EX-1027	U.S. Patent Pub. No. 2005/0207379 to Shen et al. (“Shen”)
EX-1028	Transporting data between wireless applications using a messaging system—MMS, Miraj E Mostafa, Wireless Communications and Mobile Computing (2007) (“Mostafa”)
EX-1029	Dictionary of Computer Science, Engineering, and Technology, CRC Press LLC, 2001
EX-1030	RESERVED
EX-1031	U.S. Patent No. 8,010,669 to Sathish
EX-1032	U.S. Patent No. 7,689,252 to Nishida
EX-1033	RESERVED
EX-1034	RESERVED
EX-1035	RDF Primer, W3C Recommendation 10 February, 2004 available at https://www.w3.org/TR/rdf-primer/
EX-1036	Yahoo’s RSS Reader goes LIVE on My Yahoo, available at https://www.searchenginejournal.com/yahoos-rss-reader-goes-live-on-my-yahoo/212/
EX-1037	Nokia E71 review: Nokia E71, available at https://www.cnet.com/reviews/nokia-e71-review/

Exhibit	Description
EX-1038	Plaintiff Headwater Research LLC’s Amended Infringement Contentions, Headwater Research LLC v. Samsung Electronics Co., 6:23-cv-00103-JRG-RSP (WDTX)
EX-1039	U.S. Patent No. 8,620,988 to Sohm et al. (“Sohm”)
EX-1040	U.S. Patent No. 5,581,704 to Barbara et al. (“Barbara”)
EX-1041	Declaration of Turhan F. Sarwar in Support of Motion for Admission Pro Hac Vice
EX-1042	Declaration of Gregory F. Corbett in Support of Motion for Admission Pro Hac Vice
EX-1043	Email from Board dated June 21, 2024 Authorizing the Filing of an Updated Stipulation
EX-1044	Updated Stipulation
EX-1045	Excerpts from Operating System Concepts, Abraham Silberschatz, et al., Seventh Edition (2005) (“Silberschatz”)
EX-1046	IEEE 100 The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition (2000)
EX-1047	U.S. Patent No. 7,962,798 to Locasto al. (“Locasto”)
EX-1048	U.S. Patent App. Pub. No. 2004/0002974 to Kravitz et al. (“Kravitz”)
EX-1049	Computer Desktop Encyclopedia, Alan Freedman, Ninth Edition, Osborne/McGraw-Hill (2001)
EX-1050	U.S. Patent No. 5,612,866 to Savanyo et al. (“Savanyo”)
EX-1051	Deposition Transcript of Dr. Michael C. Brogioli in IPR2024-00010
EX-1052	Declaration and Curriculum Vitae of June A Munford

I. INTRODUCTION

The parties' dispute in this proceeding is narrow, relating to one limitation recited in element [1b]/[30b]: "agent communication bus." *See* Petition ("Pet.," Paper 4), ii, vii.

Headwater's Patent Owner Response ("POR," Paper 17) does not dispute that MMS-Ogawa's "end-user device" includes an MMS User Agent that meets element [1b]/[30b]'s "*service control device link agent*" (Pet., 27-28) and multiple destination applications that meet element [1b]/[30b]'s "*plurality of device agents*" (Pet., 28-30). *See* POR, 1, 6. Nor does Headwater dispute that MMS-Ogawa's service control device link agent is "*communicatively coupled*" (Pet., 29-30) to MMS-Ogawa's device agents, as element [1b]/[30b] recites. *See* POR, 8-12. These undisputed showings alone should end the matter, because they confirm that MMS-Ogawa uses an "agent communication bus" consistent with how that term is used in the '733 Patent. Pet. 30; EX-1003, ¶124 (explaining that the specification uses "agent communication bus" to include a "communication link that facilitates communications with the device agents"); EX-1001, 42:48-61; EX-1038, 24.

Headwater nevertheless disagrees, arguing that MMS-Ogawa's various "communicatively coupled" agents would not be coupled through an "*agent communication bus*." POR, 6-12. To support this argument, Headwater (1) proffers a narrow interpretation of "agent communication bus" that limits the term

to buses that facilitate communications “external” to an application; and (2) alleges that the destination applications in TS-23.140 are “subapplications” of (thus “internal to”) the MMS User Agent. Headwater needs **both** assertions to be true to successfully argue that MMS-Ogawa would not use a bus for communications “occur[ing] internally **within** an application.” POR, 7-9 (emphasis in original).

Both of Headwater’s assertions fail:

First, no evidence supports interpreting the term “agent communication bus” to limit the types of agents that communicate over the bus—let alone to **exclude** buses that facilitate communications between an application and a subapplication. Headwater does not allege lexicography or disavowal, and cites nothing at all from the intrinsic record to support its narrow reading. Headwater does not even cite a dictionary. Headwater’s only “support” is uncorroborated, self-serving expert testimony regarding how “buses in computing” may “**typically**” be used. EX-2001, ¶37 (cited at POR, 7, 9). This testimony ignores the intrinsic and extrinsic evidence presented in this proceeding, which establishes that “agent communication bus” encompasses a communication link for agents/applications—regardless of whether the communication is internal or external to an application. EX-1001, 42:48-61; EX-1003, ¶124; Pet., 30; *see also* additional rebuttal evidence cited *infra* §§ III & IV.A.

Thus, even if MMS-Ogawa’s device agents are deemed to be internal to the service device control link agent—a premise that Petitioners disagree with—the undisputed communication link between the claimed agents in MMS-Ogawa confirms that an agent communication bus is used (or would have been obvious to implement) for agent-to-agent communications. Pet., 30-31; EX-1003, ¶¶124-126.

Second, Headwater’s argument that TS-23.140’s multimedia messaging service (MMS) is ***only*** used to transport data within the MMS User Agent application—and ***not*** used to communicate with applications “external” to the MMS User Agent application—is simply wrong. See POR, 1-2, 8-9. Headwater ***does not dispute*** that MMS is “used to transport data specific to applications” (Pet., 6; EX-1004, 54; see POR, 1), and TS-23.140 expressly defines “Application Data” as “Information / data specific ***to an application other than the MMS User Agent***¹...”). EX-1004, 14 (cited at Pet., 6). This and other evidence establish that the destination applications in TS-23.140 are not “subapplication[s]” of the MMS User Agent, and instead are external to and separate from the MMS User Agent. EX-1003, ¶¶51-52; EX-1004, 14, 54-56 (disclosing, e.g., messages to a “chess application”); EX-1028, 732-733 (illustrating a destination application that is separate from the MMS User Agent application).

¹ Emphasis added herein unless otherwise noted.

Thus, even if “agent communication bus” is narrowly interpreted to be limited to buses used for communications external to an application, MMS-Ogawa teaches or renders obvious such an “agent communication bus” for facilitating communications between the MMS User Agent and the separate (and external) destination applications on the end-user device. Pet., 30-31; EX-1003, ¶¶124-126.

To be clear, Headwater’s *only* argument in its POR—that MMS-Ogawa allegedly would not use an agent communication bus—*only* succeeds if the Board agrees with Headwater’s flawed interpretation of “agent communication bus” and agrees with Headwater’s flawed interpretation of TS-23.140’s disclosures. Neither interpretation bears scrutiny. Headwater’s assertion that MMS-Ogawa does not teach or render obvious an “agent communication bus” thus fails.

II. SKILL LEVEL

The Petition’s analysis is unchanged under Headwater’s proposed skill level (POR, 5), which is encompassed by the skill level that was proposed in the Petition (Pet., 2) and preliminarily adopted by the Board in its Decision granting institution of *inter partes* review (“DI,” Paper 12, 7).

III. HEADWATER’S NARROW INTERPRETATION OF “AGENT COMMUNICATION BUS” LACKS EVIDENTIARY SUPPORT AND IS REFUTED BY THE INTRINSIC AND EXTRINSIC RECORD

The Petition applied the ordinary and customary meaning of the term “agent communication bus” as understood by a POSITA in light of the patent and its

prosecution history (Pet., 2, 30), and explained that “[a] POSITA would have understood that the MMS User Agent and the other applications” disclosed in TS-23.140 “would interface ‘through an agent communication bus’ as that term is used in the ’733 Patent.” Pet., 30 (citing EX-1001, 42:48-61; EX-1003, ¶124).

In its POR, Headwater argues that a POSITA would not have understood MMS-Ogawa to include an “agent communication bus” under the plain and ordinary meaning of this term.² POR, 5, 7. In support of this assertion, Headwater proffers testimony of its expert, Dr. Brogioli, regarding the meaning of “agent communication bus.” *Id.*

According to Dr. Brogioli, “an agent communication bus... would be used to transfer data between *separate* applications... because buses in computing are typically used to route data *outside* of a given application, not *internal* to an application (e.g., to subparts or subapplications within that application).” EX-2001, ¶37 (emphasis original). Dr. Brogioli thus alleges that the claimed agent communication bus is limited to a bus that routes data outside an application. *Id.*

² Headwater does not allege lexicography or disavowal. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal”—which are “exacting” standards).

Headwater’s attempt to unduly narrow “agent communication bus” should be rejected because it is (1) entirely premised on uncorroborated and self-serving expert testimony and (2) refuted by the intrinsic and extrinsic evidence.

First, Headwater does not address (or dispute the Petition’s characterization of) how the term “agent communication bus” is described in the ’733 Patent, or even once cite to the relevant discussion of “agent communication bus” in the ’733 Patent, or cite to any intrinsic evidence at all when discussing the term. *See* POR, 8-12. Nor does Headwater cite to any dictionary or other extrinsic evidence to support Dr. Brogioli’s testimony regarding how “buses in computing” are “typically” used, let alone cite any evidence to support its narrow interpretation for “agent communication bus.”

Moreover, Dr. Brogioli’s purported testimony³ regarding the meaning of “agent communication bus” merely parrots the POR (POR, 7, 9) and lacks any

³ The relevance of Dr. Brogioli’s testimony to Headwater’s position is tenuous at best. Dr. Brogioli fails to explain how “buses in computing” relate to (and/or differ from) an “agent communication bus”—which is the claimed term. He also notably ***does not rule out*** the use of “buses in computing” to facilitate communications to “subapplications” (or “subparts” of a software application). *See* EX-2001, ¶37. He only opines on how the term is “typically” used without

evidentiary underpinning. EX-2001, ¶37. Such testimony is entitled to no weight because it provides no “additional supporting evidence” or “technical reasoning” to support Headwater’s conclusion. *Xerox v. Bytemark*, IPR2022-00624, Paper 9, at 15 (Aug. 24, 2022) (precedential). Headwater’s attempt to narrow “agent communication bus” fails for this reason alone, because it constitutes attorney argument that does not reflect the ordinary and customary meaning of the term as understood by a POSITA. 37 C.F.R. § 42.100(b).

Unable to identify any evidence to support its narrow interpretation, Headwater tries to contort the evidence identified by Dr. Traynor, by contending that “each of the examples Dr. Traynor provides of a ‘bus’ is for communications external to an application.” POR, 9; EX-2001, ¶¶37, 49-50. It is unclear how this, even if true, helps Headwater. The references (EX-1031; EX-1008) ***do not rule out*** using a bus for subapplication communications and, as the Petition noted (Pet., 30-31), they fully corroborate Dr. Traynor’s testimony that using a bus to facilitate inter-process communications was well-known. EX-1003, ¶¶124-125.

rendering an opinion on whether buses were ever used for communications with subapplications. He avoids rendering such an opinion because, as discussed *infra* §§ III & IV.A, they ***were*** used for such communications.

Second, a proper consideration of the intrinsic and extrinsic evidence confirms that the term “agent communication bus” is not limited to buses that facilitate communications external to an application, as Headwater contends. For example, the ’733 Patent uses the term “agent communication bus” to encompass a communication link that facilitates agent/application communications—e.g., between the service control device link agent and the device agents (Pet., 30; EX-1003, ¶124; EX-1001, 42:48-61)—*regardless* of whether the communications are internal to an application or not. The specification also explains that the ’733 Patent’s embodiments can be designed to use an “agent communication bus” to facilitate “inter-process” communications—i.e., communications between processes. EX-1001, 42:48-61 (cited at Pet., 30) (“[A]n inter-process software communication bus is a variant of D-bus (e.g., a message bus system for inter-process software communication that, for example, helps applications/agents to talk to one another”). Further, the patent uses “agent communication bus” broadly and expressly recognizes that the design of this bus can “vary,” “depend[ing]” on the “nature of the design embodiments for” agents/applications. *Id.*; *see also id.*, 42:67-43:7 (“[The implementation of the bus design will vary, and the principles and embodiments described herein will enable one of ordinary skill in the art to design the specifics of the agent communication bus 1630 to meet a particular set of product and desired functional requirements.”).

Nowhere does the patent’s discussion of the “agent communication bus”

limit this term to buses that only facilitate communications to processes *external* to an application. This is because (1) an application is a “software program consisting of *one or more processes* and supporting functions” (EX-1046, 46; EX-1047, 5:41-61 (“A software application can include multiple processes...”); EX-1048, [0003]-[0004] (“Different processes within an application may... share resources... intra application processes refer to those that are within a same application...”)); and (2) a software bus simply provides a communication link or interface over which two processes (e.g., two agents within an application or two applications) communicate with each other, regardless of whether the processes are internal or external to an application. *See, e.g.*, EX-1049, 907 (defining “software bus”: “A programming interface that allows software modules to transfer data to each other. Although ‘bus’ is traditionally a hardware term for an interconnecting pathway, it is occasionally used in this manner when the focus is on internally transferring large amounts of data from one process to another.”); EX-1045⁴, 20-21, 54-55 (describing “common models of interprocess communication” where

⁴ The book Operation System Concepts, excerpts of which are included in EX-1045, was available to the public “shortly (e.g., 2-12 weeks) after ... October 28, 2004.” EX-1052.

“communicating processes exchange messages with one another” or “use shared memory... system calls” to communicate with each other); EX-1050, 2:64-3:6 (describing “software bus” that “interconnects” a “control software’s subsystems”), 3:51-8, FIG. 5; EX-1048, [0001], [0003]-[0004], [0019] (describing “communication” between threads that “may correspond to one or more processes” and “may belong to the same process” occurring over a “bus”).

Thus, both intrinsic and extrinsic evidence confirm that the plain and ordinary meaning of “agent communication bus” encompasses any communication link between processes and is not limited to buses that *only* facilitate communications that are “external” to an application, as Headwater contends. POR, 8-9. Indeed, Headwater *itself* draws no such narrowing distinction for its infringement theories in parallel litigation. *See* EX-1038, 24 (arguing only that “an agent communication bus” is “e.g., communication path for various agents and functions to communicate over”).

IV. MMS-OGAWA TEACHES OR RENDERS OBVIOUS AN “AGENT COMMUNICATION BUS” UNDER EITHER PARTY’S INTERPRETATION OF THIS TERM

A. MMS-Ogawa Teaches or Renders Obvious an “Agent Communication Bus” Under Petitioners’ Interpretation of this Term

As discussed *supra* § III, Petitioners explained that the term “agent communication bus”—consistent with the intrinsic and extrinsic evidence—

encompasses a communication link for agents/applications, regardless of whether such communication is internal or external to an application. *See supra* § III (identifying the '733 Patent's explanation that the "agent communication bus" can include a software bus that facilitates interprocess communication for agents/applications executing on a device).

MMS-Ogawa teaches or renders obvious an agent communication bus under this interpretation. Indeed, it is *undisputed* (POR, 1, 6) that: (1) MMS-Ogawa's MMS User Agent is a "service control device link agent," as claimed (Pet., 28; EX-1004, 23-24, 30-31, 35-36); (2) MMS-Ogawa's destination applications on the user device are "a plurality of device agents," as claimed (EX-1004, 54-56; Pet., 29); and (3) MMS-Ogawa's MMS User Agent ("service control device link agent") is "communicatively coupled" to the device's destination applications ("plurality of device agents") given that the MMS User Agent routes messages to the device's destination applications (EX-1004, 54-56; Pet., 29-31).

In other words, regardless of whether the destination applications ("plurality of device agents") are internal or external to the MMS User Agent ("service control device link agent"), it is undisputed that there is a communication link between these claimed "agent[s]" in MMS-Ogawa. This alone should end the matter, because in MMS-Ogawa, the undisputed communications between the MMS User Agent and the applications would happen, as confirmed by Dr.

Traynor, “through an agent communication bus” as that term is used in the ’733 Patent. Pet., 30; EX-1003, ¶124 (explaining that the specification uses the term “agent communication bus” to include a communication link that facilitates communications with device agents); EX-1001, 42:48-61; EX-1038, 24.

The Petition also presented an alternative theory, explaining that it would have been obvious to implement a bus (such as, e.g., a D-Bus) to facilitate interprocess communications between the MMS User Agent and the destination applications (i.e., between the claimed “agent[s]”). Pet., 30-31. In MMS-Ogawa, the destination application and the MMS User Agent are applications that operate as computing processes when executed (regardless of whether the destination applications are internal or external to the MMS User Agent). *See id.*; *see also* EX-1045, 3, 16-17, 20, 64 (identifying “application programs” and noting that “a program loaded into memory and executing is called a process”). The Petition explained that implementing MMS-Ogawa to use an “agent communication bus” for communications between agents would have been obvious, since software buses (such as, e.g., D-bus) for “inter-process communications” were a well-known, conventional way of facilitating communications between the MMS User Agent and other applications, e.g., the destination applications described in TS-23.140. Pet., 30-31. Headwater’s suggestion that this is untrue is plainly inconsistent with references from the relevant period, which describe processes

with operations that are affected by and/or share data with another process—like the MMS User Agent and the destination applications (or any other internal or external applications)—as utilizing “interprocess communication (IPC) mechanism[s]” such as a software bus to enable “exchange [of] data and information.” *See* EX-1045, 96, 156-157; *see also* EX-1050, 2:64-3:6, 3:51-67, FIG. 5; EX-1048, [0001], [0003]-[0004], [0019].

Headwater’s response to the Petition’s alternative obviousness theory is that the destination application in MMS-Ogawa is a “subapplication” of (and thus internal to) the MMS User Agent application, and that a bus “typically” would not be used for communications internal to an application, and that “[r]ather than use a ‘bus,’” “standard function calls” would be used for such internal communications. POR, 10; EX-2001, ¶38.

These arguments fail for multiple reasons.

First, Headwater’s arguments rest on the flawed premise that the destination applications are subparts of (and thus internal to) the MMS User Agent. They are not—for reasons explained *infra* § IV.B.

Second, even assuming *arguendo* TS-23.140’s destination applications are “subparts” of the MMS User Agent application in MMS-Ogawa (they are not), Headwater raises no credible basis (*see* POR, 9-10) to disregard Dr. Traynor’s testimony about the reasons to implement communications between agents using

an “agent communication bus,” as that term is used in the ’733 Patent. Pet., 30-31; EX-1003, ¶¶124-126. Headwater instead relies on Dr. Brogioli’s statement regarding how “buses in computing are *typically* used.” EX-2001, ¶37; POR, 9. But this statement is uncorroborated and irrelevant, and more importantly, **does not rule out** the use of “buses in computing” to facilitate communications to “subapplications” (or “subparts” of a software application). See EX-2001, ¶37. Dr. Brogioli only opines on how the term “bus” is “typically” used and specifically does not render an opinion on whether “buses” were ever used for communications with subapplications. They *were* used for such communications. See, e.g., EX-1045, 96, 156-157; EX-1050, 2:64-3:6, 3:51-8, FIG. 5; EX-1048, [0001], [0003]-[0004], [0019]. What’s more, Dr. Brogioli’s testimony ignores the ’733 Patent’s use of the term “agent communication bus” to encompass a communication link that facilitates “inter-process” communications—i.e., communications between *processes* (EX-1001, 42:48-54, 42:67-43:7; see also EX-1003, ¶124; EX-1038, 24), which as discussed above, may be part of one application (EX-1046, 46; EX-1050, 5:41-61; EX-1048, [0003]-[0004]).

Third, and again assuming *arguendo* that TS-23.140’s destination applications were “subparts” of the MMS User Agent application (they are not), Headwater offers self-serving and uncorroborated testimony of Dr. Brogioli to contend that, rather than a bus, transportation of “AppData” to a subapplication

would use “standard function calls” to “simply write the AppData to a memory location within the subapplication of the MMS User Agent identified by the AppID.” POR, 10; EX-2001, ¶38. For support, Headwater again cites self-serving testimony from Dr. Brogioli that parrots the POR and alleges that “applications are able to effectively manage data and memory issues without the use of any type of ‘bus.’” EX-2001, ¶38.

As an initial matter, Dr. Brogioli cites *no* additional supporting evidence or technical reasoning to support this position and thus this testimony is entitled to no weight. *Xerox*, at 15. Moreover, there is no evidence whatsoever that the use of function/method “calls” and “buses” are mutually exclusive. Instead, the evidence of record establishes that *both* may be used together. *E.g.*, Sathish (EX-1031), 10:56-62 (cited at Pet., 30) (disclosing use of a “bus” as an “inter-process communication channel,” and “*method calls over the D-Bus*” that are “addressed to a particular application”); EX-1003, ¶125. Further still, and as explained above, a POSITA would have recognized that interprocess communication facilitates the data exchange between the processes for the destination applications and the MMS User Agent, and that it would be obvious to use a bus (such as, e.g., D-bus) to enable such interprocess communications. EX-1003, ¶¶125-126; *see also* EX-1045, 96, 156-157; EX-1050, 2:64-3:6, 3:51-8, FIG. 5; EX-1048, [0001], [0003]-[0004], [0019].

Finally, to the extent Headwater is attempting to argue that a POSITA would not have used a bus because an application and subapplication reside in the same area in memory (POR, 10)—that assertion is again wholly unsupported by any corroborating evidence. *Xerox*, at 15. Moreover, the '733 Patent refutes that proposition by explaining that an “agent communication bus” can be an “inter-process software communication bus” that “run[s] a session bus” which is “protected by storing all software (e.g., software components, applications and/or agents) *in secure memory*” and “executing all software and communications *within a... protected memory space*.” EX-1001, 42:54-67. Thus the '733 Patent itself describes the use of a bus to facilitate communications between software components located in the same area within memory. *Id.*

In summary, MMS-Ogawa undisputedly includes a “service control device link agent” that is “communicatively coupled” to a “plurality of device agents” (Pet., 27-30). If the Board agrees with Petitioners that the term “agent communication bus” does not exclude communication links to a subapplication, this is fatal to Headwater’s argument that a POSITA would not have understood or found obvious MMS-Ogawa to have an “agent communication bus” (*see* POR, 7), because Petitioners’ broader interpretation undisputedly encompasses the MMS-Ogawa communication link (Pet., 30). The Challenged Claims should be cancelled on this basis alone.

B. MMS-Ogawa Teaches or Renders Obvious an “Agent Communication Bus” Under Headwater’s Narrower and Unsupported Interpretation of this Term

The Challenged Claims should also be cancelled even if the term “agent communication bus” is interpreted narrowly, as Headwater suggests. In particular, Headwater interprets the term “agent communication bus” as being limited to a bus that “route[s] data outside of a given application” and excludes communications “internal to an application (e.g., to subpart or subapplications within that application).” POR, 9; EX-2001, ¶37.

Headwater contends that the destination applications in TS-23.140 are subapplications of the MMS User Agent, and, applying its narrow interpretation, argues that it would not have been obvious to use an “agent communication bus” for communications between the MMS Agent and “various destination subapplications.” POR, 9. Notably, TS-23.140 never refers to destination applications as “subapplications” of the MMS User Agent. Headwater’s characterization is based on taking a statement in TS-23.140—which says that “[a]pplications that intend to transport application specific data using MMS may... reside on an MMS User Agent” POR, 8 (quoting EX-1004, 54)—out of context.

When TS-23.140’s statement is considered in context, there can be no dispute that (1) the destination applications are not “internal to” the MMS User Agent application; and (2) the term “MMS User Agent” is used in some contexts to refer

to the user device/equipment, such that a POSITA understood that applications residing on the MMS User Agent referred to applications on the user device. Thus, even if the Board accepts Headwater's narrow interpretation of "agent communication bus" as excluding communications internal to an application, MMS-Ogawa meets the "agent communication bus" term because it transports data from the MMS User Agent to a separate, external destination application. Pet., 30-31.

1. MMS-Ogawa's Destination Applications Are Not "Internal to" the MMS User Agent Application

The Petition established that MMS is used to transport data specific to applications "*other than the MMS User Agent.*" Pet., 6 (citing EX-1004, 14, 54-56; EX-1003, ¶51; EX-1028, 732-733). Detail regarding transportation of such "application data" is provided in Section 7.1.18 of TS-23.140, entitled "Support for transporting Application Data." See EX-1004, 54-56; EX-1003, ¶52. Petitioners' expert, Dr. Traynor, explained that a POSITA understood Section 7.1.18 to describe these "other" applications as "resid[ing] on" (EX-1004, 54-56) the "MMS User Agent" *device*, "because 'MMS User Agent' was a term that was used also to refer to a client device" in some contexts. EX-1003, ¶51 (citing EX-1028, 731); see also EX-1004, 160 (Annex A.8, showing "MMS UA" device).

Headwater disagrees, arguing that "a POSITA would understand that... the destination applications are not external to the MMS User Agent [application], but

instead ‘reside on [the] MMS User Agent’” application itself. POR, 8 (EX-1004, 54). On this basis, Headwater argues that TS-23.140’s “destination applications” are “subapplications” or “subparts” of the MMS User Agent application. *Id.*

Headwater’s focus on this detail is a red herring, because as discussed *supra* §§ III and IV.A, the term “agent communication bus” does not exclude buses that facilitate communication between an application and its “subapplications”/“subparts.” Even if it did exclude such buses, Headwater’s argument still fails, as discussed below.

2. MMS Was Used to Transport “Application Data” Specific to Applications “Other Than” the MMS User Agent

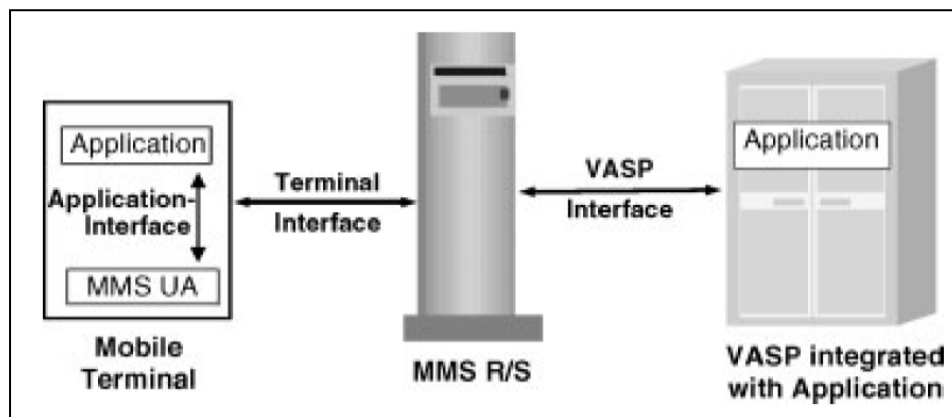
Numerous disclosures in TS-23.140 confirm that the MMS User Agent application and the destination applications (which receive “application data”) are separate applications. *See* Pet., 6 (citing EX-1003, ¶¶51-52; EX-1004, 14, 54-56; EX-1028, 732-733). For example, the phrase “Application Data” itself is defined in TS-23.140 as “information/data specific to *an application other than* the MMS User Agent.” EX-1004, 14. This definition is consistent with TS-23.140’s use of “MMS User Agent” to describe an “application” which “performs MMS-specific operations” “on “*another application’s* behalf.” *Id.* Moreover, in Section 7.1.18—which discusses MMS’s “Support for transporting *Application Data*” (EX-1004, 56) that is “specific to *an application other than* the MMS User Agent”

(*id.*, 14)—TS-23.140 characterizes the “MMS User Agent” and the “application” that registers with it as “***two entities***” that “exchange[]” information (*id.*, 54).

Given these disclosures, it is unsurprising that TS-23.140 never refers to destination applications as—or ***requires*** destination applications to be—“subapplications” or “subparts” of the MMS User Agent application. Instead, TS-23.140 treats the MMS User Agent and destination applications as separate applications with different functions, roles, and responsibilities.

The MMS User Agent application “performs ***MMS-specific*** operations on a user’s behalf and/or on another application’s behalf,” including using MMS to transport data to destination applications. EX-1004, 14, 19, 56. The destination application—e.g., a chess application (*id.*, 55) which “need[s] to register” in some way with the MMS User Agent application (*id.*, 54)—then performs its own distinct, ***non-MMS*** functions which TS-23.140 does not even describe. EX-1004, 56 (“The further handling and processing of the information by the destination application ***is outside the scope of this specification.***”). Headwater’s implication that the MMS User Agent application and, e.g., a chess application, are the ***same*** application is simply wrong. Likewise, Headwater’s implication that TS-23.140 only contemplates the MMS User Agent application transporting application data to ***itself*** makes no sense.

Separately, TS-23.140's disclosure of using MMS to communicate with *separate*, external destination applications is independently corroborated by Mostafa (EX-1028), which illustrates an MMS User Agent application and a destination application *as separate entities* on a mobile terminal and communicating with each other using an "application interface." See EX-1028, 732-733 (cited at Pet., 6, 29). Mostafa, FIG. 4 page 732 is shown below:



EX-1004, FIG. 4

Mostafa's clear illustration corroborates how POSITAs understood TS-23.140's teachings—and directly contradicts Headwater's strained assertion that a POSITA "would understand that in TS-23.140, the destination applications are *not external* to the MMS User Agent." POR, 8-9.

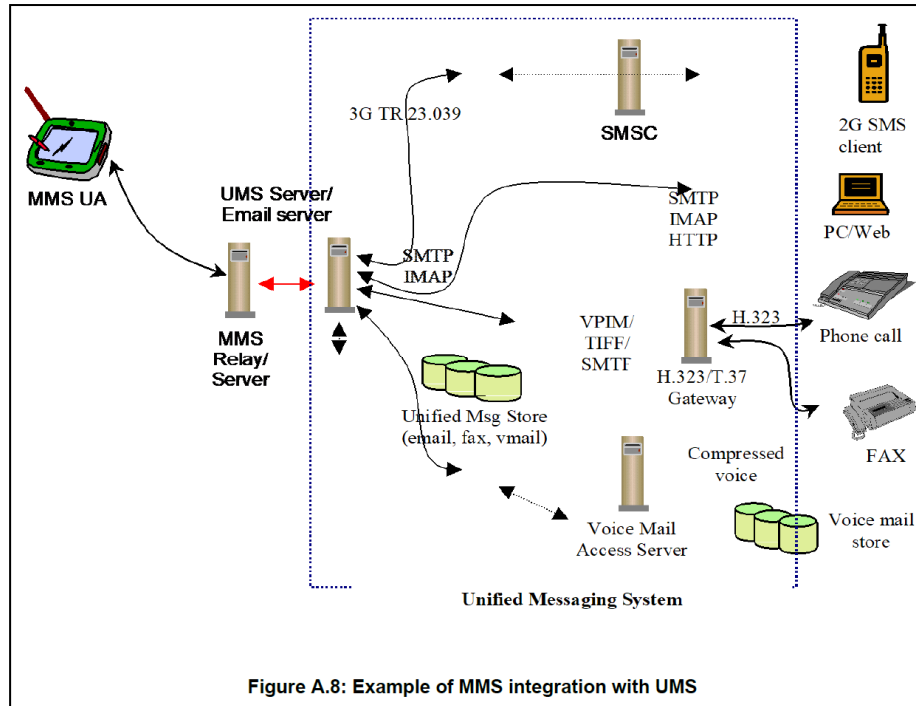
3. A POSITA Understood that in Some Contexts, TS-23.140 Used "MMS User Agent" to Refer to the User Device

Numerous disclosures in TS-23.140 and Mostafa also confirm Dr. Traynor's explanation that a POSITA understood that in some contexts "MMS User Agent"

referred to the user device/terminal, and not just the MMS User Agent's application layer functionality. EX-1003, ¶51 (discussing EX-1004, 54).

One such context is the passage which Headwater seizes upon to suggest that MMS is not used to transport application data to “external” applications—i.e., TS-23.140's discussion of destination applications that “reside on” the MMS User Agent. POR, 8-9 (discussing EX-1004, 54). As noted in § IV.B.2, this language appears in a section describing MMS's “Support for transporting *Application Data*” (EX-1004, 56) that is “specific to *an application other than* the MMS User Agent” (*id.*, 14). And as Dr. Traynor explained, a POSITA would have understood in the context of the standard that the destination applications disclosed in TS-23.140 “reside on” the user equipment (UE)/terminal instead of the application. EX-1003, ¶51.

Another such context is TS-23.140's illustration of an MMS implementation in Annex A.8 (below), which uses “MMS UA” to label a device/terminal (left).



EX-1004, Figure A.8

Yet another such context is Mostafa, which describes the “MMS user agent (UA),” as a “*client*” that “provides means for composing, sending, retrieving, viewing, and other controlling functions to users.” EX-1003, ¶51 (discussing EX-1028, 731). As Dr. Brogioli concedes, a well-known use of the word “client” was a “computer.” See EX-2001, ¶43 (“While ‘client’ *can* refer to a ‘computer’ (see *id.*, third definition)...”) (emphasis original). This is corroborated by Dr. Brogioli’s own dictionary. See EX-2004, 102 (defining “client”: “3. On a local area network or the Internet, a *computer* that accesses shared network resources provided by another computer (called a server).”); *id.* (defining the “client component” in a “client/server architecture”: “The *client* component *is a complete, standalone personal computer* (not a “dumb” terminal), and it offers the user its

full range of power and features for running applications... The client portion of the application is typically optimized for user interaction...”).

These disclosures all confirm that Headwater’s use of the “reside on” language to assert that TS-23.140’s destination applications *must be* “subapplications” of the MMS User Agent (POR, 8-9) is wrong. Indeed, *this is further confirmed by Dr. Brogioli’s own testimony regarding TS-23.140*. During deposition in a related case (IPR2024-00010), Dr. Brogioli discussed TS-23.140’s disclosure of the MMS Relay/Server “stor[ing] messages in the network until the recipient MMS User Agent becomes reachable (e.g. user moves back into coverage, switches MMS User Agent on)” (EX-1004, 29)—and admitted that this referred to a “*user terminal* being available or reachable over a network.” *See* EX-1051, 51:21-53:6.

Thus, even if the Board accepts Headwater’s narrow interpretation of “agent communication bus” and agrees that it excludes communication links to subapplications (§§ III and IV.A), Headwater fails to establish that MMS-Ogawa’s destination applications are in fact “subapplications” of the MMS User Agent. Indeed, as explained above, TS-23.140’s destination applications are separate from, and external to, the MMS User Agent application. Thus, the premise that MMS is not used to transport data to applications that are external to the MMS User Agent is false. And, Dr. Brogioli’s testimony that buses were used to “route

data outside of a given application” (POR, 9; EX-2001, ¶37) only *bolsters* Dr.

Traynor’s testimony that a POSITA would have had reason to (and that it was thus obvious to) use an “agent communication bus” to transport data from the MMS User Agent application to a separate application. EX-1003, ¶¶125-126 (cited at Pet., 30-31). Headwater’s suggestion that a POSITA would not have understood MMS-Ogawa to have an “agent communication bus”—even under its narrow interpretation of this term—lacks merit and is refuted by the present record. The Challenged Claims should therefore be cancelled on this additional basis.

V. CONCLUSION

Claims 1-17, 19, 21-27, 29, and 30 should be cancelled.

Respectfully submitted,

Date: February 7, 2025

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CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petitioner's Reply to Patent Owner's Response totals 4,978 words, which is less than the 5,600 allowed under 37 CFR § 42.24(c)(1).

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.6(e)(4), the undersigned certifies that on February 7, 2025, a complete and entire copy of this Petitioner's Reply to Patent Owner's Response and Accompanying Exhibits were provided by email, to the Patent Owner by serving the email correspondence addresses of record as follows:

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