

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD.,
Petitioner,

v.

HEADWATER RESEARCH LLC,
Patent Owner.

IPR2024-00010
Patent 9,615,192 B2

**DECLARATION OF DR. MICHAEL C. BROGIOLI IN SUPPORT OF
PATENT OWNER'S RESPONSE**

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I, Michael C. Brogioli, PhD, hereby declare as follows:

I. INTRODUCTION

1. I am over the age of eighteen (18) years and otherwise competent to make this declaration.

2. I have been retained as an expert witness on behalf of Headwater Research LLC (“Headwater”) for the above-captioned *inter partes* review (“IPR”). I understand that the petition for *inter partes* review involves U.S. Patent No. 9,615,192 (“the ’192 patent”).

3. I make this declaration based on my personal knowledge, educational background and training, consideration of the materials I discuss herein, and my expert opinions.

4. I am being compensated at a rate of \$750 per hour for my time in this matter. My compensation does not depend on the outcome of this proceeding, and I have no financial interest in its outcome.

5. In preparing this Declaration, I have reviewed and considered the ’192 Patent, the ’192 Patent’s prosecution history, the Petition, Dr. Traynor’s declaration submitted in this proceeding, and each document cited in my declaration.

II. BACKGROUND AND QUALIFICATIONS

6. My qualifications for forming the opinions given in this declaration are summarized here and are addressed more fully in my curriculum vitae, which is submitted as Exhibit 2002. That exhibit also includes a list of my publications.

7. I am currently an Adjunct Professor of Electrical and Computer Engineering at Rice University in Houston, TX, teaching Ph.D. candidate level courses in wireless telecommunications, embedded computing software, embedded computing hardware, and software/hardware design. I have held this position since July 2009. I am also currently the Managing Director of Polymathic Consulting in Austin, TX, a company that advises a variety of clients on engineering, research and development, intellectual property, and other technical leadership matters, and I have held this position since October 2011.

8. I am a named inventor on multiple issued and pending patent applications. The subject matter of these applications includes, but is not limited to, embedded processing, edge computing, and various aspects of distributed systems including computation, interconnectivity and hardware/software design and implementation.

9. From November 2009 to October 2011, I was Chief Architect, Senior Member Technical Staff at Freescale Semiconductor in Austin, TX (formerly Motorola), responsible for management of technology, engineering roadmaps,

design lead on compiler infrastructure and optimizations for mobile and embedded computing solutions, including the types of security and encryption technologies involved in this matter. From 2007 to 2009, I was a Senior Engineer working with high performance compiler design and next generation baseband compiler design and next generation baseband microprocessor and microcontroller architecture at Freescale Semiconductor in Austin, Texas, including regarding communications networks and how mobile device architecture and design interacts with network elements.

10. From June 2006 to August 2007, I worked as the Technical Co-Founder of Method Seven LLC, in Boston, MA, working with high performance software and hardware systems architecture. I am currently the co-founder, co-inventor, and Chief Technology Officer of Network Native, an Internet of Things hardware and software company. I have also served on multiple advisory boards for technology companies over the past 10 years.

11. While at Rice University, I developed various computer architecture designs. For example, from 2002 to 2004, I developed Spinach, a simulator design toolset for modeling programmable network interface architectures, which models system components common to all programmable computing environments as well as components specific to embedded. From 2004 to 2009, I developed Spinach DSP-FPGA, a modular and composable simulator design infrastructure for

programmable and reconfigurable embedded SOC architectures specifically targeting mobile, embedded and portable computing devices. From 2005 to 2009, I developed and published a retargetable compiler infrastructure for software and systems related to mobile and embedded computing technologies. Many of these tools have been used at U.S. universities in the area of electrical and computer engineering research.

12. I am recognized as an expert in the field of communications systems, including computer architecture, hardware, and software as they relate to the subject matter at hand. I am a member of the Institute of Electrical and Electronics Engineers (IEEE). I am currently the Program Chair of Design Automation Conference in the areas of Embedded and Wireless Solutions. I have been a Program Committee member for the IEEE and ACM Design Automation Conference from 2011 to the present, as well as other IEEE and ACM conferences. I have published, co-published and contributed to numerous works on wireless and mobile computing, digital networking, Internet of Things technology, software and hardware optimizations, and digital signal processing and related architectures among other topics.

13. I have previously served as an engineering consultant and testifying witness on matters related to, and including Internet and communications technologies such as those at hand in this matter. This experience is encompassed

in my work in academia and as a faculty member, my time in industry as a system designer and architect, as well as my work as an engineering consultant and expert witness over the past 15 years.

14. Over the past 20+ years, I have authored numerous peer reviewed publications in the area of embedded and high performance computing, interconnect technologies, and optimization at the hardware and software design level. I have also been a committee member, and chair of Design Automation Conference in areas of technology related to the '192 patent, often reviewing and vetting submissions from major industry players in the design and architectural issues related to various technologies at issue in this matter.

15. During my tenure at Freescale Semiconductor, I was in charge of system developer tools for baseband processor design, both in the hardware and software spaces. This work included hardware and software design issues of next generation wireless networking equipment, including system level programming models, interconnect technology, heterogeneous computing, various hardware acceleration technologies and related components.

16. My current curriculum vitae, provided in Exhibit 2002, contains more information on my background and experience, as well as the cases in which I have served as an expert witness the past four years.

17. No part of my compensation is contingent upon the outcome of this litigation. I have no other interests in this litigation or with any of the parties.

III. LEGAL PRINCIPLES

A. Claim construction

18. I understand that the first step in performing a validity analysis of the patent claims is to interpret the meaning and scope of the claims by construing the terms and phrases found in those claims. I understand that the appropriate construction of a claim term is its ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent.

19. I understand that the standard for claim construction in an *inter partes* review is the same standard as is applied in district court proceedings.

20. I understand that a determination of the meaning and scope of the claims is a matter of law. I have been informed that to determine the meaning of the claims, one should consider the intrinsic evidence, which includes the patent's claims, written description, and prosecution history.

B. Burden of Proof

21. I understand that in an *inter partes* review, the petitioner has the burden of proving unpatentability by a preponderance of the evidence.

C. Anticipation

22. I have been instructed by counsel and understand that a reference is anticipated if a single prior art reference discloses each and every claim element, either explicitly or inherently, as arranged in the same way as in the claim. I understand that where even one claim element is not disclosed in a reference, a contention of anticipation fails.

23. I further understand that when a reference fails to explicitly disclose a claim element, that reference inherently discloses that element only if the reference must necessarily include the undisclosed claim element.

D. Obviousness

24. I have been instructed by counsel and understand that a combination of prior art references may render a claim obvious if, at the time of the invention, a person of ordinary skill in the art would have selected and combined those prior-art elements in the normal course of research and development to yield the claimed invention.

25. I understand that in an obviousness analysis, one should consider the *Graham* factors: the scope and content of the prior art; the differences between the claimed inventions and the prior art; the level of ordinary skill in the art; and certain secondary considerations, identified below. I further understand the obviousness analysis is to be performed on a claim-by-claim basis. I understand

that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton.

26. I have been instructed by counsel and understand that obviousness requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. I understand obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have been motivated to combine or modify those references in a manner that would include all limitations of the challenged claim, and, in making that combination, a person of ordinary skill in the art would have had a reasonable expectation of success.

27. I also understand that an obviousness analysis must be conducted with awareness of the distortion caused by hindsight bias and with caution of arguments reliant upon *ex post* reasoning. For instance, I understand that when considering obviousness, I should put myself in the position of a person of ordinary skill in the field at the time of the invention, rather than considering new information that is known today but was not known before the priority date of the challenged patent.

28. In particular, I understand that it is improper to use the challenged patent's disclosure or invention as a roadmap to find its prior-art components, because such an approach discounts the value of combining various existing features or principles in a new way to achieve a new result.

IV. OVERVIEW OF THE '192 PATENT

29. The '192 patent is generally directed to a message link server that receives messages from various network elements, which messages include data for, and an identification of, an authorized software component on a wireless end-user device, and which evaluates a plurality of message delivery triggers before delivery of the message to the appropriate software component.

30. Claim 1 is representative and recites:

[1pre] A message link server comprising:

[1a] a transport services stack to maintain a respective secure message link through an Internet network between the message link server and a respective device link agent on each of a plurality of wireless end-user devices,

[1b] each of the wireless end-user devices comprising multiple software components authorized to receive and process data from secure message link messages received via a device link agent on that device;

[1c1] an interface to a network to receive network element messages from a plurality of network elements,

[1c2] the received network element messages comprising respective message content and requests for delivery of the respective message content to respective wireless end-user devices, the respective message content including data for, and an identification of, a respective one of the authorized software components; and

[1d1] a message buffer system including a memory and logic,

[1d2] the memory to buffer content from the received network element messages for which delivery is requested to a given one of the wireless end-user devices,

[1d3] the logic to determine when one of a plurality of message delivery triggers for the given one of the wireless end-user devices has occurred, wherein for at least some of the received network element messages, the receipt of such a message by the message buffer system is not a message delivery trigger, and for at least one of the message delivery triggers, the trigger is an occurrence of an asynchronous event with time-critical messaging needs, and

[1d4] upon determining that one of the message delivery triggers has occurred, the logic further to supply one or more messages comprising the buffered content to the transport services stack for delivery on the secure message link maintained between the transport services stack and a device link agent on the given one of the wireless end-user devices.

Ex. 1001, claim 1. Claim 15 is similar in many respects, but recites a “method of operating a message link server.” Ex. 1001, claim 15.

31. In the context of the ’192 patent, a POSITA would understand that message delivery triggers may include the reception of a server message, i.e., “transmit[ting] server messages asynchronously as they arrive.” Ex. 1001 70:1-3. Alternatively, the server “can determine when to transmit based potentially on several parameters, such as one or more of” a listed set of parameters. *Id.* 70:8-13.

These parameters include “[a] periodic timer trigger, waiting until a certain amount of service usage or traffic usage has occurred, responding to a service agent message, responding to a service agent request, initiated by a verification error condition, and/or initiated by some other error condition.” A POSITA would understand that these constitute message delivery triggers because the specification refers to them as “transmission trigger[s].” *Id.* at 70:6-16.

Transmission triggers further include “asynchronous messages or polling for messages, constant frequency transmission, transmission based on how much service usage or data usage has taken place, transmission in response to device side control link message, service verification error events, other error events, and/or other message transmission trigger criteria.” *Id.* 70:16-30.

V. PERSON OF ORDINARY SKILL IN THE ART

32. Dr. Traynor states that “a person of ordinary skill in the art (‘POSITA’) relating to the subject matter of the ’192 Patent as of January 28, 2009 (‘Critical Date’) would have had (1) at least a bachelor’s degree in computer science, electrical engineering, or a related field, and (2) three to five years of experience in services and application implementation in communications networks. Additional graduate education could substitute for professional experience, and *vice versa*.” Ex. 1003, ¶21.

33. For purposes of this declaration, I mostly accept Dr. Traynor's proposed level of skill in the art, with two caveats. First, as Dr. Traynor acknowledges, a POSITA need only have "three... years of experience in services and application implementation in communications networks," and that is the understanding I adopt. Persons having three years of experience and five years of experience have *different* levels of skill, so Dr. Traynor's proposal does not lend itself to application of a single "level of skill in the art." Second, I do not believe Dr. Traynor's ambiguous qualification that "[a]dditional graduate education could substitute for professional experience, and *vice versa*" is appropriate, because his proposed level of skill does not require "*professional* experience." In my view, a POSITA would have had a bachelor's degree plus the requisite three years of experience, and that experience could either be either industry experience or research/educational experience.

34. I further note that I am a person of ordinary skill in the art, and was such a person as of January 28, 2009 (regardless of whether three years or five years of experience is applied as the correct standard).

VI. CLAIM CONSTRUCTION

35. Dr. Traynor does not propose a construction of any term at issue in this proceeding. For each claim limitation at issue, I apply what I believe would

have been the plain and ordinary meaning to a POSITA in light of the specification and file history of the '192 patent.

36. While the application of plain and ordinary meaning applies to all claims, I separately address my interpretation of “periodic timer” because it appears Dr. Traynor takes a substantially broader view of that term than its plain and ordinary meaning. By way of background, the term “periodic timer” appears in the context of claim 9, which depends from claim 1 and further specifies that “one of the message delivery triggers is the expiration of a periodic timer.”

37. The '192 patent does not define “periodic timer.” However, a POSITA would understand it to refer to a timer that recurs in accordance with a given time period. For example, The Authoritative Dictionary of IEEE Standards Terms defines “periodic” as “[of] or pertaining to a series of specified waveforms or features which *repeat or recur regularly... in time*,” as opposed to “aperiodic” in which the “waveforms or features repeat or recur... *irregularly* in time.” Ex. 2004 at 13.

38. In the context of messaging systems, Dr. Traynor himself provides a helpful example of something that occurs *periodically*: “periodic polling.” Ex. 1003 ¶198 (relying on periodic polling for his claim 9 analysis, and stating that “periodic polling is akin to a periodic timer expiring because polling happens at periodic intervals”). A POSITA would understand that periodic polling is a scheme

in which a system will “poll” (or inquire as to the status of some value) in a recurring manner at some defined frequency. The time between these recurring polls would be referred to as the “period” of the periodic polling.

39. This understanding of “periodic” is consistent with Samsung’s own usage of “periodic” in its own patents. *See, e.g.*, Ex. 2005, 13:42-43 (U.S. Patent No. 10,931,348, assigned to Samsung) (noting that “Step 2” should be performed “periodically with [set] period TP2”); Ex. 2006, 2:30-42 & FIG. 2 (U.S. Patent No. 10,694,522, assigned to Samsung) (“To avoid excessive PDCCH overhead, some... transmissions may be configured to occur periodically.... Such scheduling is referred to as persistent. FIG. 2 illustrates the concept of persistent scheduling where an initial packet transmission 210 occurs periodically every assignment interval.”).

40. As I discuss in more detail in my claim 9 analysis, Dr. Traynor applies a far broader understanding of what constitutes a “periodic timer.” For instance, he contends that a timer “continu[ing] for a particular period” constitutes a “periodic timer,” regardless of whether it recurs at regular intervals. Ex. 1003, ¶197. And at his deposition, Dr. Traynor stated that “expiration of a periodic timer” might even be satisfied by a “user looking at the clock and waiting” until a particular time had passed before they sent a message. *See* Ex. 2003, 17:14-18:7.

41. Dr. Traynor’s interpretation of a “periodic timer” is inconsistent with the term’s ordinary meaning discussed above. If one were to actually interpret claim 9 in the suggested manner, it would have the effect of rewriting claim 9 to remove the term “periodic” as follows: “The message link server of claim 1, wherein one of the message delivery triggers is the expiration of a *periodic* timer.” A POSITA would understand, for example, that the phrase “expiration of a... timer” (without the use of the term “periodic”) requires that some time period is being measured. *See* Ex. 2004, 12 (“arm a timer: To start a timer measuring the passage of time, enabling the notification of a process when the specified time or time interval has passed.”). Thus, if all that were required for a “periodic timer” were a timer being “triggered and continu[ing] for a particular period,” then *any* timer would be “periodic,” because all “timers” that can “expire” must necessarily expire after *some* period of time. But claim 9 specifically recites a *periodic* timer, and in my opinion a POSITA would not interpret “periodic timer” contrary to its plain meaning in a manner that would remove “periodic” from the claim.

VII. ANALYSIS OF DR. TRAYNOR’S GROUNDS 1-4

42. Dr. Traynor’s Grounds 1-4 all rely on TS-23.140 alone, and not in combination with any other references, for his allegations of obviousness with respect to claims 1 and 15, which are the only two challenged independent claims. Dr. Traynor’s Grounds 1-4 also rely solely on TS-23.140 alone to satisfy claim 9.

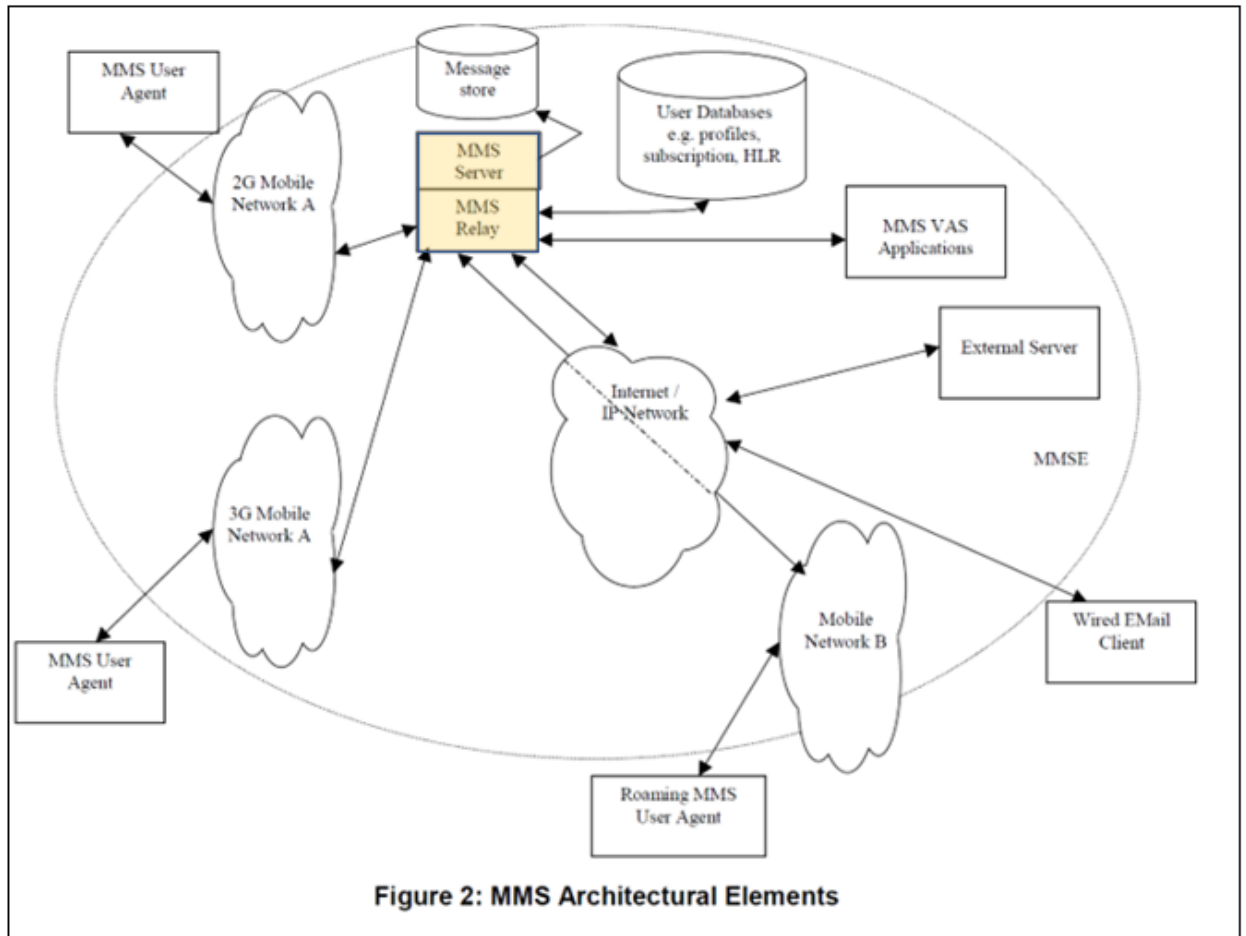
However, as explained below, Dr. Traynor does not establish that TS-23.140 renders obvious the requirements of those claims.

A. TS-23.140 does not disclose or render obvious “a plurality of message delivery triggers” as recited by limitations [1d3]/[15d2].

43. Claim 1 requires “logic to determine when one of a plurality of message delivery triggers... has occurred,” and claim 15 recites a similar requirement. Ex. 1001, claim 15 (“determining when one of a plurality of message delivery triggers... has occurred”). However, as explained further below, a POSITA would understand TS-23.140 to teach the use of only a *single* message delivery trigger—the receipt of a valid retrieval request from the MMS User Agent. *See* Ex. 1004, 29 (“Upon retrieval request the recipient MMS Relay/Server *shall* deliver the MM to the recipient MMS User Agent.”).

44. Before addressing the logic of Dr. Traynor’s theory, I first provide some background regarding his theory as well as background regarding the general framework disclosed by TS-23.140.

45. In his Ground 1 theory, Dr. Traynor relies on the MMS Relay/Server as constituting the claimed “message link server.” Ex. 1003 ¶¶95-97. Dr. Traynor’s annotation of Fig. 2 (highlighting the MMS Relay/Server) of TS-23.140 is below.



Ex. 1003, ¶96 (Dr. Traynor’s annotation of Ex. 1004 at 17, FIG. 2).

46. As shown in the above diagram, the MMS Relay/Server can receive messages from various entities, including MMS VAS Applications and an External Server. The MMS Relay/Server also sends and receives messages from various MMS User Agents, which a POSITA would understand to be agents operating on wireless end-user devices.

47. TS-23.140 provides a framework that includes definition of certain roles and responsibilities for certain of these components. For example, TS-23.140

states that the “MMS Relay/Server shall provide” specified functionalities including “receiving and sending MM [multimedia messages].”

The MMS Relay/Server shall provide the following functionalities:

- receiving and sending MM;
- conversion of messages arriving at the recipient MMS Relay/Server from legacy messaging systems to MM format (e.g. facsimile to MM) if interworking with legacy messaging systems (MM3) is supported;
- conversion of MMs leaving the originator MMS Relay/Server to legacy messaging systems to the appropriate message format (e.g. MM to internet email) if interworking with legacy messaging systems (MM3) is supported;
- message content retrieval;
- MM notification to the MMS User Agent;

Ex. 1004, 21.

48. Although as shown above the MMS Relay/Server is the entity responsible for physically “sending [the] MM” to the MMS User Agent, TS-23.140 elsewhere specifies that it is actually the MMS User Agent that is tasked with *initiating* “MM delivery to the MMS User Agent.” *Id.*, 19 (“The MMS User Agent *shall* provide the following application layer functionalities: the retrieval of MMs (*initiate MM delivery to the MMS User Agent*):”

5.1.1 MMS User Agent operations

The MMS User Agent shall provide the following application layer functionalities:-

- the retrieval of MMs (*initiate MM delivery to the MMS User Agent*);
- terminal capability negotiation.

Id., 19. I note that the above citation (and other portions of TS-23.140) discuss things that “shall” occur and other things that “may” occur. A POSITA would understand that TS-23.140’s usage of these terms is generally consistent with how they are used

in other standards documents, which is to say that something that “shall” occur is a mandatory requirement of an implementation of the standard, and something that “may” occur is an optional feature or implementation.

49. As shown by the citations above, TS-23.140 draws a distinction between controlling initiation of delivery (which as discussed in more detail below is performed by the MMS User Agent by sending a valid retrieval request) and the actual delivery of the message (which is necessarily performed by the MMS Relay/Server which must attempt delivery of the message upon receiving a valid retrieval request).

50. TS-23.140 provides additional context regarding how the MMS User Agent initiates MM delivery to the MMS User Agent. Specifically, it states that whenever an MMS Relay/Server receives a MM, it “shall generate a notification to the recipient MMS User Agent.” Ex. 1004, 28 (“Upon reception of an MM the recipient MMS Relay/Server.... Shall generate a notification to the recipient MMS User Agent.”). Then, “[i]n a response to the notification the MMS User Agent” has two options—either reject the MM, or retrieve the MM:

In a response to the notification the MMS User Agent shall be able to

- reject the MM or
- retrieve the MM, either immediately or at a later time (i.e. defer the MM retrieval), either manually or automatically, as possibly determined by the operator configuration and user profile.

Ex. 1004, 28.

51. TS-23.140 provides still additional detail regarding how the retrieval occurs: in specific response to a retrieval request from the MMS User Agent. *See* Ex. 1004, 29 (“The recipient MMS User Agent shall be able to request retrieval of an MM from the recipient MMS Relay/Server based on the Message Reference received in a notification.”).

52. When the MMS User Agent provides a valid retrieval request (i.e., a retrieval request conforming to the TS-23.140’s requirements, including being within the message expiry period and having an appropriate size restriction), the MMS Relay/Server must initiate delivery of the MM to the MMS User Agent:

7.1.3 Retrieval of a Multimedia Message in the recipient MMSE

The recipient MMS User Agent shall be able to request retrieval of an MM from the recipient MMS Relay/Server based on the Message Reference received in a notification. If MMBboxes are supported, the MMS User Agent shall be able to request retrieval of an MM from the user’s MMBbox, based on a Message Reference received from a previous MMBbox operation.

Within a retrieval request the recipient MMS User Agent may indicate a size restriction of the returned MM (i.e., maximum size) that the MMS Relay/Server is to use in processing the retrieval request.

Upon retrieval request the recipient MMS Relay/Server

- shall deliver the MM to the recipient MMS User Agent

Ex. 1004, 29 (annotated). The only exception to this requirement—that the “MMS Relay/Server shall deliver the MM” “[u]pon [a received] retrieval request”—is that the “MMS Relay/Server... should **not** deliver the MM... to the recipient MMS User Agent unless the size restriction set by the MMS User Agent is met.” *Id.*, 29. In other words, so long as a retrieval request does not specify a size restriction inconsistent with a message, a retrieval request **shall** trigger delivery of the message by the MMS

User Agent. Accordingly, because the valid retrieval request initiates message delivery, a POSITA would understand that reception of the valid retrieval request constitutes the message delivery trigger in TS-23.140.

53. TS-23.140 is explicit that the retrieval request is a message delivery trigger, and TS-23.140 does not disclose any other scenarios as message delivery triggers that would trigger message delivery from the MMS Relay/Server to the MMS User Agent. For example, the *only* instance in which the MMS Relay/Server “shall deliver the MM to the recipient MMS User Agent” is “[u]pon retrieval request.” Ex. 1004, 29.

54. I further note that the *only* disclosed exception to delivery “[u]pon retrieval request” is if “the size restriction set by the MMS User Agent is [not] met.” Ex. 1004, 29. It is thus my opinion that reception of a valid retrieval request, and *only* reception of a valid retrieval request, is disclosed as initiating the delivery procedure of the MMS Relay/Server in the context of TS-23.140.

55. Dr. Traynor identifies several other scenarios as being alleged “message delivery triggers” in TS-23.140 (*see* Ex. 1003 at ¶155 spanning pages 77-79), but in my opinion he fails to provide an adequate explanation as to how these scenarios satisfy the plain meaning of a “message delivery trigger.” Each of these scenarios is addressed in turn:

56. **First**, Dr. Traynor’s first bullet point contends that a scenario where the “MMS Relay/Server has sent a notification to the recipient User Agent” constitutes a message delivery trigger. Ex. 1003 ¶155. But Dr. Traynor does not explain how sending the notification (as separate from receiving a valid retrieval request) constitutes a message delivery trigger.

57. **Second**, Dr. Traynor’s second and fifth bullet points assert that when the “recipient MMS User Agent requests message retrieval upon MMS Relay/Server receiving the notification—e.g., within a message expiry period,” and when “the message retrieval request’s ‘size restriction’” is consistent with the message, message delivery is triggered. *See* Ex. 1003 ¶155. For some reason, Dr. Traynor separates this retrieval request discussion into two *different* alleged “message delivery triggers.” However, a POSITA would understand that whenever a “valid” retrieval request is received (i.e., a retrieval request conforming to the TS-23.140’s requirements, including being within the message expiry period and having an appropriate size restriction), message delivery is triggered. Dr. Traynor provides no basis for separating reception of a message retrieval request and the contents of that message retrieval request into two separate “message delivery triggers.” I note that under Dr. Traynor’s apparent logic, each “Mandatory” component of retrieval request (set forth at Ex. 1004, pp. 71-73) would seemingly constitute a *separate* “message delivery trigger,” because each of these mandatory

components must be present in a valid retrieval request. I disagree with that interpretation; instead, it is my opinion that a POSITA would understand a valid retrieval request in its entirety to be the message delivery trigger.

58. **Third**, Dr. Traynor’s third bullet point, as best I can understand it, identifies expiration of a “deferred delivery period” as constituting a “message delivery trigger.” Ex. 1003, ¶155. Dr. Traynor appears to contend that a retrieval request will provide a “specified delivery period,” and upon expiration of that period the message will be delivered. But this is simply not how TS-23.140 works. I have reviewed TS-23.140, and it does not provide any basis for an MMS User Agent to specify a “message expiry period” in a retrieval request, as Dr. Traynor implies. For instance, TS-23.140 provides a lengthy table of elements that may be included within a retrieval request, none of which include a deferral timer. *See* Ex. 1004, 71-73 (“Table 11: Information elements in the MM1_retrieve.REQ”).

59. Instead, a POSITA would understand “deferral” in TS-23.140 to refer to the MMS User Agent itself waiting to issue the retrieval request. This is explicitly illustrated by TS-23.140, which shows that deferral of MMS involves a notification response to a notification request, but does ***not*** involve a retrieval request:

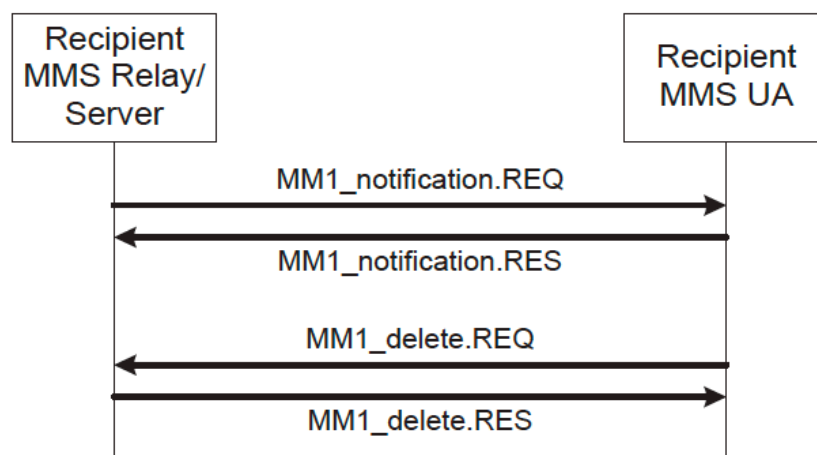
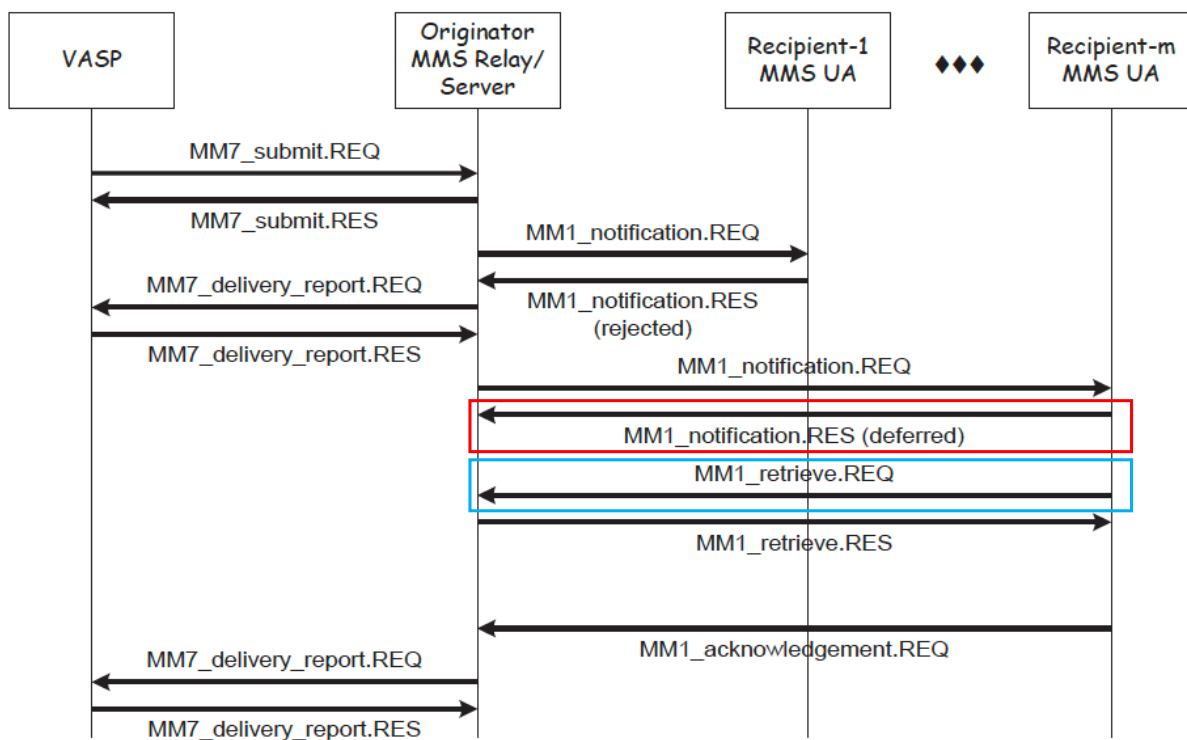


Figure 7A: Example Abstract Message Flow, for deletion of deferred MMs

Ex. 1004 at 61 (FIG. 7A).

60. Furthermore, a POSITA would understand that when retrieval is deferred (as indicated in a notification response), the MMS User Agent must *subsequently* issue a retrieval request to obtain the deferred message. For example, in the below diagram from TS-23.140, a deferral notification (annotated in red) is first sent from the User Agent to the MMS Relay/Server, and *then* a retrieval request (annotated in blue) is sent from the User Agent immediately prior to the retrieval response (i.e., message delivery).



Ex. 1004, 111 (annotated version of FIG. 8). In the context above, the MM1_notification.RES (deferred) message is simply an acknowledgement that the User Agent received the message—there is no identification of a “deferred delivery period” as Dr. Traynor implies. See Ex. 1004, 69 (“Table 9: Information elements in the MM1_notification.RES” not including any deferred delivery period or equivalent elements). The only factor influencing the deferral is the fact that the User Agent itself may delay in submitting the MM1_retrieve.REQ to the Relay/Server.

61. Accordingly, Dr. Traynor is incorrect that “the recipient MMS User Agent requests deferred delivery of the message retrieve message request” (Ex.

1003 ¶155)—that is inconsistent with how TS-23.140 works, and I disagree that TS-23.140 discloses such a scenario as a message delivery trigger.

62. **Fourth**, Dr. Traynor’s fourth bullet point contends that the “recipient MMS User Agent [being] available” constitutes a “message delivery trigger.” Ex. 1003 ¶155. But TS-23.140 is clear that the User Agent being available is not a message delivery trigger—the message delivery is triggered “[u]pon retrieval request.” Ex. 1004, 29. TS-23.140 instead states that as part of message delivery, messages can be buffered (i.e., stored in the network) “until the recipient MMS User Agent becomes reachable... or until the MM expires.” Ex. 1004, 29. A POSITA would understand that this is simply *how* message delivery (which is triggered “[u]pon [a valid] retrieval request”) functions; if message delivery is triggered, the outgoing message will be buffered until delivery is complete or until message expiration. This is consistent with how physical delivery of messaging works in real-world systems—delivery does not occur instantaneously, but may be spread over several packetized transmissions, and data packets will be buffered until the delivery can be completed. While delivery *completion* may be delayed due to a lack of coverage in TS 23.140, a POSITA would understand that delivery will be triggered upon reception of a valid retrieval request.

63. I understand that the Petition (but not Dr. Traynor) separately contends that message expiration could be a message delivery trigger. I disagree

with that assertion as well; TS-23.140 implies that message expiration can lead to “[a]utomatic deletion” of the message, not delivery. *See* Ex. 1004, 40. In my opinion, TS-23.140’s teachings about the scenarios in which messages should be buffered pending delivery completion or message expiration (Ex. 1004, 29) are simply an indication of *how* message delivery should be implemented, and are not themselves message delivery triggers.

64. Dr. Traynor’s only explanation as to how any of the above scenarios (other than reception of a valid retrieval request) supposedly constitute a “message delivery trigger” is his equation of a “message delivery trigger” with a “condition[]” that must be met before a message can be delivered. Pet. 22 (“MMS Relay/Server does not deliver the message to the recipient MMS User Agent (corresponding to a particular user terminal) until the above *conditions/triggers* are met...”). I disagree with this logic. In any real-world system, countless “conditions” must be met before a message is delivered. As just one of numerous examples, a messaging server needs to be connected to a working power source so that it can physically send the packets that constitute the message before message delivery can occur. Of course, this does not mean that “connection to a working power source” is a “message delivery trigger,” and a POSITA would understand that such an interpretation would render the claims’ recitation of “a plurality of message delivery triggers” meaningless.

65. In sum, in view of TS-23.140's explicit teaching that a valid retrieval request (and **only** a valid retrieval request) triggers the MMS Relay/Server to deliver a MM to the MMS User Agent, a POSITA would understand that TS-23.140 discloses only a **single** message delivery trigger, not "a plurality of message delivery triggers" as all challenged claims require.

66. Dr. Traynor also provides no evidence or reasoning as to why "a plurality of message delivery triggers" would have been obvious in the context of TS-23.130. For instance, his declaration sets forth no motivation to modify the disclosures of TS-23.140 to incorporate multiple message delivery triggers, and does not even explain what any modifications would have entailed. *See generally* Ex. 1003 ¶¶153-160. While it's impossible for me to evaluate the obviousness of modifications that haven't even been proposed, I do note that a POSITA would generally have had a strong incentive to **not** deviate from TS-23.140's requirements, because a major purpose of a 3GPP document such as TS-23.140 is to achieve standardization in implementation, and to avoid the potential for inconsistent implementations that could create compatibility problems.

B. TS-23.140 does not disclose or render obvious that “one of the message delivery triggers is the expiration of a periodic timer” as recited by claim 9.

67. Dr. Traynor sets forth two separate theories as to how claim 9 is satisfied, both of which fail (and both of which generally mischaracterize TS-23.140’s teachings).

1. I disagree with Dr. Traynor’s “periodic polling” theory.

68. Dr. Traynor contends that the requirement of claim 9 is satisfied because “MMS User Agent uses periodic polling to identify new messages on an external server, and subsequently retrieves those messages—which also demonstrates another example [of] a message delivery trigger that is the expiration of a periodic timer (as indicated by periodic polling).” Ex. 1003 ¶198. In my opinion, this is fundamentally incorrect, because the idea that the MMS User Agent engages in the alleged periodic polling is directly contrary to TS-23.140.

69. Specifically, Dr. Traynor relies upon Section 8.3.3 of TS-23.140, which states that “[f]or discovery of incoming messages from external messaging systems different mechanisms may be utilized, e.g.,:... periodic polling for messages on External Server, followed by retrieval by the MMS User Agent via the MMS Relay/Server.” Ex. 1004, 90-91 (cited by Ex. 1003 ¶198).

70. Notably, the above teaching of TS-23.140 does **not** say (as Dr. Traynor asserts) that the ***MMS User Agent*** engages in periodic polling. Rather, it

says that the periodic polling is used for “discovery of incoming messages from external messaging systems.” Ex. 1004, 90-91. A POSITA would understand that the MMS Relay/Server performs the polling, because it is the MMS Relay/Server’s role (not the MMS User Agent’s role) to interact with external messaging systems (i.e., “External Servers”). *See* Ex. 1004, 22 (“*Convergence functionality between External Servers and MMS User Agents is provided by the MMS Relay/Server* which enables the integration of different server types across different networks.”).

71. The fact that it is the MMS Relay/Server, ***not*** the MMS User Agent, that coordinates with the external messaging system is further shown by FIGS. 2 and 4 of TS-23.140, both of which show the MMS User Agent separated from the external servers by MMS Relay/Server:

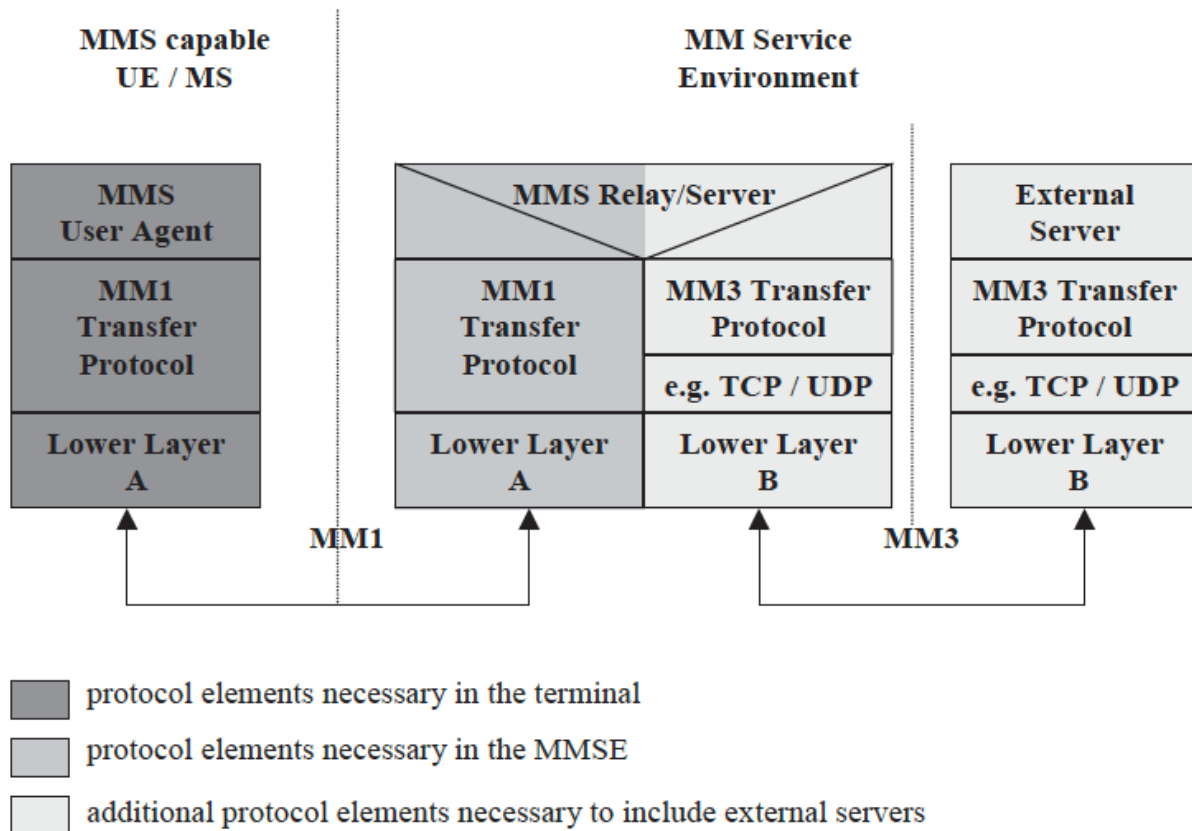


Figure 4: Protocol Framework to provide MMS

Ex. 1004, 24.

72. I further note that TS-23.140 gives a specific example of how periodic polling would work with an external messaging system (such as a “voice mailbox”). Specifically, where polling is used, “the *MMS Relay/Server* may poll the voice mailbox via POP3 or IMAP4 for new messages received.” Ex. 1004, 157-158. Nowhere does this example (or any other teaching of TS-23.140) indicate that the *MMS User Agent* would periodically poll an external server, as the Petition asserts. Additionally, such an implementation would make little sense; it

would cause unwanted and unnecessary battery drain on the part of the mobile device, and it would cause unwanted and unnecessary network communications between the mobile device and the MMS Relay/Server. (The MMS User Agent would not be equipped to *directly* poll an external server because external servers use “non-MMS-specific protocols.” Ex. 1004, 14.)

73. At his deposition, I understand that Dr. Traynor mostly relied on a generalized understanding of “how phones work” as support for his assertion that the *MMS User Agent* in TS-23.140 engaged in periodic polling. Ex. 2003 at 13:12-16:9 (acknowledging that the evidence he relied on does not have “an explicit discussion” of “what component is performing the periodic polling,” but “this is a regular function of UEs”).

74. Even if phones might engage in periodic polling in certain contexts, a POSITA would understand Dr. Traynor’s assertion that the periodic polling (which he testified “would be retrieval requests”—Ex. 2003 at 14:12-18) would be performed by the User Agent to be inconsistent with TS-23.140. Specifically, TS-23.140 makes clear that the purpose of “periodic polling” would be for “*discovery* of incoming messages.” Ex. 1004, 90-91. But retrieval requests can only occur *after* the MMS User Agent is *aware of* an incoming message. For instance, a retrieval request message *must* include a “Message Reference” value. *See* Ex. 1004, 71 (stating that “Message Reference” is a “Mandatory” component of

“MM1-Retrieve.REQ”). TS-23.140 further teaches that “[t]his reference *was previously delivered to the MMS User Agent*” through any number of messages that would be sent by the MMS Relay/Server. Ex. 1004, 69. For instance, the “Message Reference” used to perform message retrieval is typically received from the MMS User Agent “in a notification” from the MMS Relay/Server. Ex. 1004, 29; *id.*, 28 (“With the MM notification the recipient MMS User Agent shall receive a message reference that can be used for retrieving the MM from the recipient MMS Relay/Server.”). In other words, without previously being *aware of* an incoming message, it would be impossible for an MMS User Agent to perform the polling that Dr. Traynor alleges would have occurred. Accordingly, Dr. Traynor’s alleged “periodic polling” could not be used for “to identify new messages on an external server” as Dr. Traynor alleges. *See* Ex. 1003, ¶198.

75. Furthermore, my opinion above is consistent with the high-level purpose of Section 8.3 of TS 23.140. Specifically, TS 23.140 states that Section 8.3 “*defines the interworking between MMS Relay/Servers and External Messaging Servers.*” Ex. 1004, 90. This further confirms that Section 8.3’s disclosure of “periodic polling” would be performed by the MMS Relay/Server, *not* the MMS User Agent as Petitioner and Dr. Traynor assert without any evidentiary support.

76. I additionally note another problem with Dr. Traynor’s reliance on “polling to identify new messages on an external server” as satisfying the

requirements of claim 9: “An External Server is connected to [an] MMS Service Provider via non-MMS-specific protocols.” Ex. 1004, 14. But Dr. Traynor provides no evidence that a message received from an external server using a non-MMS-specific protocol would meet the requirements of claim 1.

2. I disagree with Dr. Traynor’s “earliest time of delivery” theory.

77. Dr. Traynor additionally notes that an “earliest desired time of delivery” can be specified by an “originating MMS User Agent.” On that basis, he contends that “[a] POSITA would have understood or found obvious that specifying the desired delivery time triggers a periodic timer upon receipt of a message that expires when the delivery time is reached, which then triggers the delivery of the message.” Ex. 1003, ¶¶196-197.

78. However, this again represents a fundamental misunderstanding of how TS-23.140 operates. Specifically, as noted in Section VII.A above, TS-23.140 makes clear that the **only** way a message can be delivered to an MMS User Agent is that the MMS User Agent first issues a valid retrieval request. Using TS-23.140’s “earliest desired delivery time” in a way such that the message would be delivered when the time is reached would be inconsistent with TS-23.140’s operation, and would remove the receiving MMS User Agent’s autonomy in initiating MM delivery, which is a mandatory part of TS-23.140. *See* Ex. 1004, 19 (“The MMS User Agent **shall** provide the following application layer

functionalities [including] the retrieval of MMs (*initiate MM delivery to the MMS User Agent*)....”).

79. While it is not clear exactly how Dr. Traynor contends the earliest desired time of delivery would be a message delivery trigger, it appears that he relies on TS-23.140’s teaching that when “earliest desired time of delivery” expires, the MM will be “routed forward” to the intended MMS User Agent recipient. *See* Ex. 1004, 27 (“Upon reception of an MM from an originator MMS User Agent the originator MMS Relay/Server... shall retain the MMS until the earliest time of delivery, if the optional feature... is supported by the originator MMS Relay/Server. If this feature is not supported then the MM is immediately routed forward....”). But a POSITA would understand that this portion of TS-23.140 is referring to routing an MM between two different MMS Relay/Servers, which is made clear by TS-23.140’s teaching later in the section, which teaches that “where the recipient MMS Relay/Server is *also* the originator MMS Relay/Server,” then “the MM does not have to be routed forward” at all. Ex. 1004, 28.

80. In other words, “rout[ing]” a message forward is referring to routing the message between MMS Relay/Servers, not a reference to delivery of the message from an MMS Relay/Server to an MMS User Agent. By having the *originating* MMS Relay/Server “retain the MM until the earliest time of delivery,

if the optional feature of earliest time of delivery is supported by the originator MMS Relay/Server” (Ex. 1004, 27), the originating MMS Relay/Server **guarantees** that the recipient MMS Relay/Server (i.e., the MMS Relay/Server that will ultimately be responsible for delivering the MM to the recipient MMS User Agent) will not deliver the message before the earliest desired time of delivery.

81. Accordingly, while an “earliest desired time of delivery” setting could potentially constitute a trigger for a first MMS Relay/Server to forward an MM *to another MMS Relay/Server*, there is no explanation of how that would be a trigger for the MMS Relay/Server to deliver a message *to an MMS User Agent* as the Dr. Traynor’s theory would require. *See, e.g.,* Ex. 1001 at limitation [1d4] (requiring that “upon determining that one of the message delivery triggers has occurred... supply[ing] one or more messages... for delivery on the secure message link maintained between the transport services stack ***and a device link agent on the given one of the wireless end-user devices***”).

82. I also disagree that an “earliest desired time of delivery” being reached is an “expiration of a ***periodic*** timer.” Dr. Traynor’s sole explanation as to why an earliest delivery time satisfies a “periodic timer” is that “each time a message is received, the timer is triggered and continues for a particular period.” Ex. 1003, ¶197. But as discussed above in Section III.A, a “periodic timer” is a

timer that recurs at regular intervals, rather than just a timer “that continues for a particular period” as Dr. Traynor’s logic would require.

83. Dr. Traynor sets forth no explanation why TS-23.140’s “earliest desired time of delivery” would be in accordance with “expiration of a *periodic* timer,” as opposed to just “a [non-periodic] timer.” For instance, Dr. Traynor presents no evidence that any “earliest desired time of delivery” timer in TS-23.140 would recur at regular intervals.

84. Accordingly, in my opinion, Dr. Traynor fails to establish that the “earliest desired time of delivery” is related to the expiration of a periodic timer (in addition to failing to establish that the earliest desired time of delivery is a “message delivery trigger” for delivery of a message to an MMS User Agent).

85. Furthermore, although the Dr. Traynor alleges that a “POSITA would have understood *or found obvious* that specifying the desired delivery time” meets the claim requirements, he does not set forth any allegations supporting his obviousness theory for me to evaluate. *See* Ex. 1003 ¶197. For example, he does not allege any motivation a POSITA would have had to modify the disclosures of TS-23.140 to satisfy the claim requirements, and he does not even explain what any modifications would have entailed. As I have noted previously, a POSITA generally would have had an incentive to avoid modifying the teachings of TS-

23.140, because the purpose of that document is to set forth a standard for consistently compatible implementations.

VIII. ANALYSIS OF DR. TRAYNOR’S GROUNDS 5-8

86. Dr. Traynor’s Grounds 5-8 all rely on a combination of just the Houghton and Munson references for the Petition’s allegations of obviousness with respect to claims 1 and 15, which are the only two challenged independent claims. Grounds 5-8 also rely on a combination of just Houghton and Munson to satisfy claim 9. As explained below, it is my opinion that Dr. Traynor fails to show that Houghton in combination with Munson renders obvious those claims.

A. Houghton and Munson do not render obvious that “network element messages” that are “received” by “an interface” of the “message link server” would comprise “message content including data for, and an identification of, a responsive one of the authorized software components.”

87. Claim 1 recites a “message link server comprising... an interface to a network to receive network element messages... the received network element messages comprising respective message content to respective wireless end-user devices, the respective message content including data for, and an identification of, a respective one of the authorized software components.” Claim 15’s “method of operating a message link server” has a similar requirement of “receiving network element messages from a plurality of network elements, the received network element messages comprising respective message content and requests for delivery

of the respective message content to respective wireless end-user devices, the respective message content including data for, and an identification of, a respective one of the authorized software components.”

88. Most relevant to my analysis in this section, the language of both claims 1 and 15 requires that **messages received by the message link server** provide “an identification of a respective one of the authorized software components.”

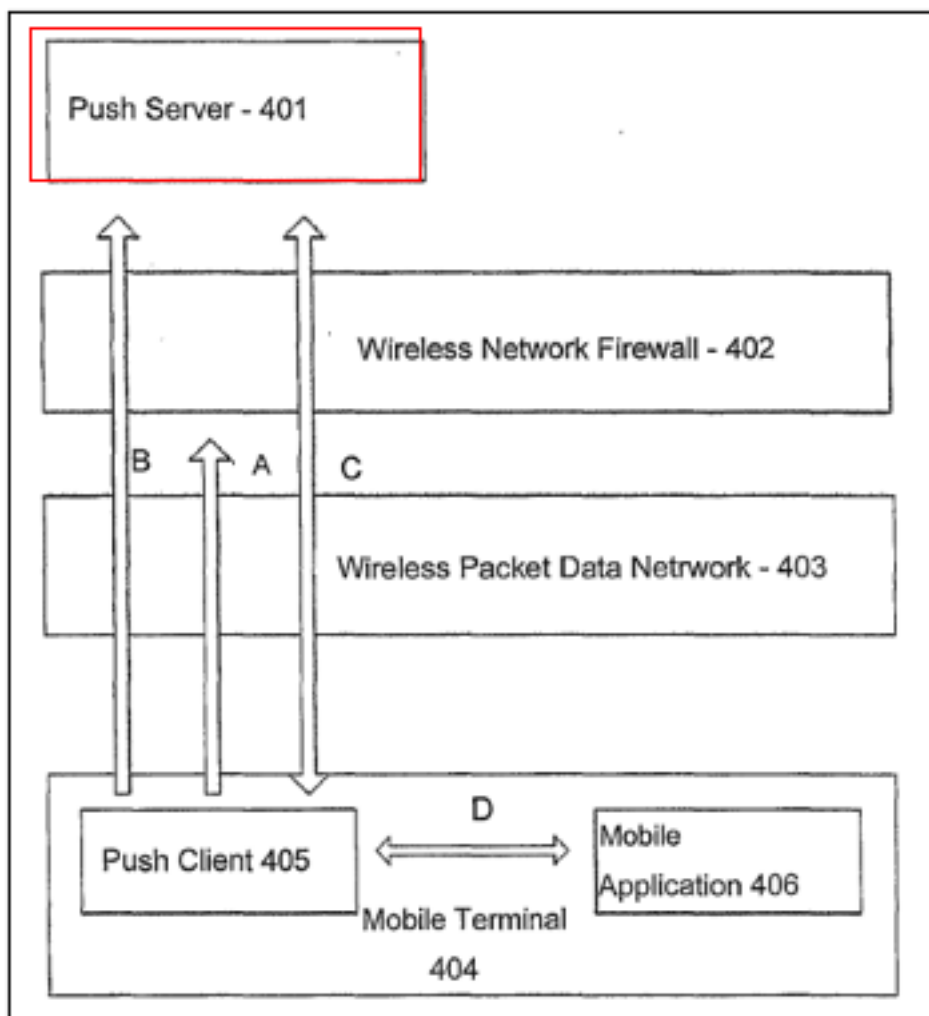
89. As I discuss in more detail below, it is my opinion that Dr. Traynor fails to show that these claim requirements (which Dr. Traynor purports to address in limitations [1c2] and [15c2]) are disclosed or rendered obviousness under his Ground 5 theory. Dr. Traynor, for example, does not allege that in either of Houghton or Munson, the message content **received by the alleged message link server** includes “an identification of, a respective one of the authorized software components.” *See* Ex. 1003 ¶¶332-342. Instead, he asserts that in Houghton, the message **sent from** the message link server to the wireless end-user device would include the claimed “identification of a respective one of the authorized software components.” *See* Ex. 1003, ¶333-34 (addressing only the contents of “the message pushed from push server 401/801 to push client 405/805” in ¶333, and on that basis concluding without explanation in ¶334 that “Houghton discloses or suggests

that... push messages from application server(s)... include message content with... an identification of th[e] application”).

90. Below, I provide an overview of Dr. Traynor’s Ground 5 theory, followed by a discussion of why his theory is deficient.

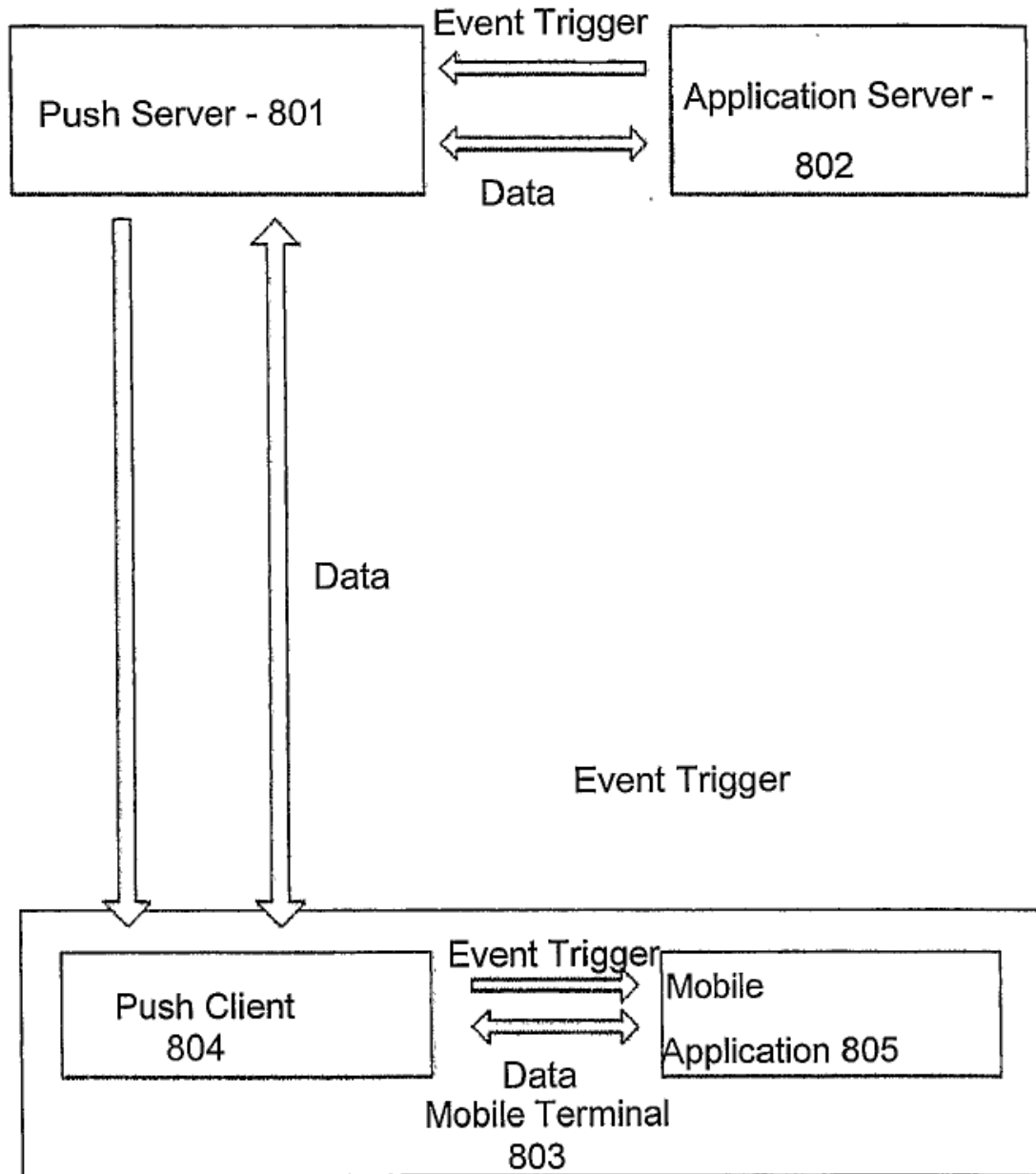
1. Overview of Dr. Traynor’s Ground 5 Theory

91. Dr. Traynor’s Ground 5 theory maps the claimed “message link server” to Houghton’s “push server.” Ex. 1003 ¶¶279-280. Dr. Traynor’s annotation of Houghton’s Figure 4, annotating the “push server” as constituting the preamble’s requirement of the “message link server,” is reproduced below.



Ex. 1003, ¶279 (annotating Houghton’s FIG. 4).

92. The “push server” relied upon by Dr. Traynor is also depicted as element 801 in Houghton’s FIG. 8, reproduced below.

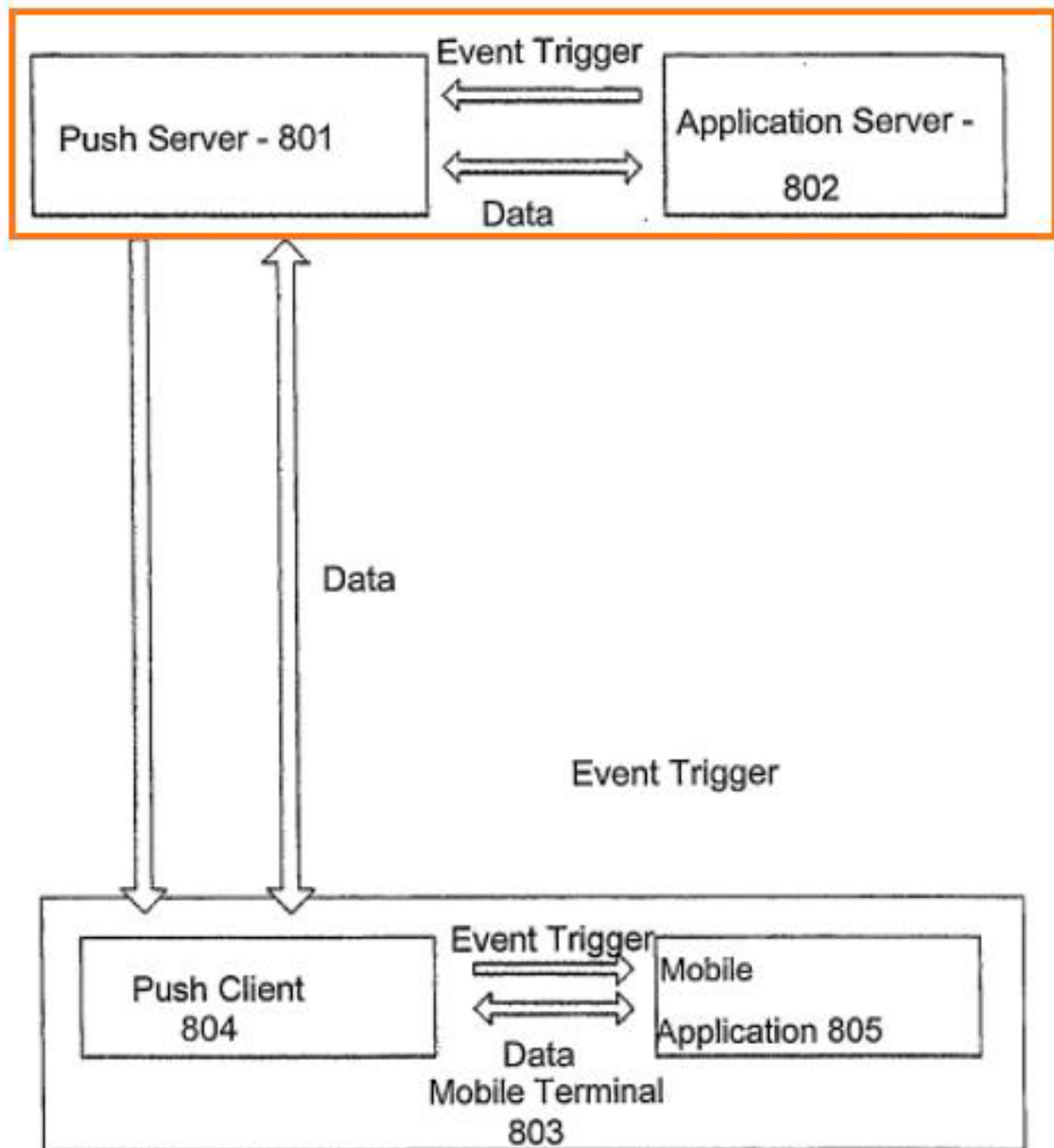


Ex. 1007, FIG. 8; *see* Ex. 1003 ¶322 (quoting Houghton’s discussion of “push server 401/801”).

93. Dr. Traynor further maps “application server(s) 702/802” to the claimed “plurality of network elements” (from which the claimed “network element messages” must be received by the message link server / push server). *See*

Ex. 1003 ¶319 (identifying the “plurality of network elements” as being “application server(s) 702/802”). The Dr. Traynor’s annotation of the claimed “interface to a network to receive network element messages from a plurality of network elements” is shown below, clearly identifying the communications between the push server and application server (and *not* communications between the push server and push client):

Figure 8



Ex. 1003, ¶321 (Dr. Traynor's annotation of Ex. 1007, FIG. 8).

94. Regarding the requirement that the messages *received* by the message link server (which he maps to Houghton’s push server) from the “network elements” (which he maps to Houghton’s application server(s)) include “an identification of, a respective one of the authorized software components” as required by limitations [1c2] and [15c2], Dr. Traynor alleges that this is disclosed or suggested because in Houghton, “[t]he message pushed from push server 401/801 to push client 404/804 includes a ‘data packet’” which includes “information specifying which mobile application” is the intended recipient of the message. Pet. 69-70.

2. Dr. Traynor’s Ground 5 theory fails because it at most shows what the messages sent by the push server indicate, not on what the messages received by the push server would indicate.

95. Dr. Traynor’s analysis for limitations [1c2] and [15c2] described above is deficient because it relies *solely* on evidence of what the *messages sent from push server* to the push client indicate. Dr. Traynor does not identify any discussion in Houghton (the sole reference relied upon for limitations [1c2] and [15c2]) that specifies that a message sent from the application server to the push server would include an identification of an application, which is the relevant inquiry.

96. Dr. Traynor’s sole allegation it would be obvious that a message *received by* the push server is contained in paragraph 334 of his declaration, reproduced in its entirety below:

334. In view of the above disclosures, a POSITA would have understood that Houghton discloses or suggest that the received network element messages (push messages from application server(s) 702/802) include message content with data for the destination mobile application, as well as an identification of this application (based on the information “specifying which mobile application 407 from a plurality of such applications”).

Ex. 1003, ¶334. But “the above disclosures” (referring to the disclosures he cites in paragraph 333 of his declaration) *uniformly* relate to the message content between either (1) the push server and push client, or (2) the push client and mobile application. None of them have anything to say about the received *by the push server from the application server* including an identification of the application, as his theory would require.

97. Furthermore, Dr. Traynor provides no reasoning whatsoever to bridge this gap. I have reviewed his declaration, but do not understand *why* he believes Houghton discloses or suggests what would need to be shown under Dr. Traynor’s claim mapping. Specifically, I do not understand *why* he believes that Houghton

discloses or suggests that the message received *by the push server from the application server* would include an identification of the application.

98. I also note that logically, there would no need for the message sent from the application server to the push server to include an identification of an application in Dr. Traynor's proposed combination. For instance, to the extent an application server is unique to a particular application (e.g., an Instagram server that only directs messages to the Instagram application), the push server could readily determine the appropriate application identifier based on which application server the message was received from, and include that application identifier in the message sent to the push client. And to the extent the application server is ***not*** unique to a particular application (e.g., a Gmail server may have email messages that could go to any number of client email applications, such as Gmail, Outlook, Apple Mail, etc.), the application server would not necessarily know which application the message should be directed to. Instead, the application server would simply provide information that does ***not*** identify the receiving application (such as a user's email address, e.g., Director@uspto.gov), and the push server would determine ***which specific*** applications the message should be sent to. The push server would presumably be in a better position than the application server to perform this determination, because the push server has the ability to directly communicate with each client device to determine, e.g., which mail applications

are configured to receive push messages corresponding to a particular email address.

99. In sum, it is my opinion that Dr. Traynor has not shown that the messages *received by* Houghton’s push server would include an application identifier. He at most shows the obviousness of the messages *sent by* Houghton’s push server including an application identifier, which is not what the claims recite.

B. Dr. Traynor fails to show that Houghton/Munson renders obvious that “one of the message delivery triggers is the expiration of a periodic timer” as recited by claim 9.

100. Dr. Traynor’s sole theory as to how his Ground 5 theory satisfies claim 9 is a theory in which it would have been obvious to “implement[] Munson’s teaching of using periodic timers (and expiration of the same) as a message delivery trigger.” Ex. 1003, ¶391 (further stating that “A POSITA would have been motivated to use periodic timers as a message delivery trigger, *as contemplated by Munson*....”). I note that although Dr. Traynor states in passing that “Houghton... discloses a periodic message” (Ex. 1003, ¶390), he does *not* allege that Houghton’s alleged “periodic message” constitutes a “message delivery trigger” either in Houghton or the proposed combination of Houghton with Munson. *See* Ex. 1003, ¶¶388-392. Accordingly, it is apparent that Dr. Traynor’s theory relies on the assumption that Munson does, in fact “us[e] periodic timers (and expiration of the same) as a message delivery trigger.” *See* Ex. 1003, ¶391.

101. In my opinion, Dr. Traynor’s theory fails because he does not show that Munson uses a periodic timer as a message delivery trigger. His only evidence for this assertion is a citation to paragraph [0044] of Munson, which I have reproduced in its entirety below:

In one embodiment, a content can be pushed according to a schedule of time or event. For example, when used with a group push, an application service provider can use pushes (i.e., pushing contents) for a system maintenance purpose during off-peak hours to take advantage of lower rates.

Ex. 1017, [0044] (cited by Ex. 1003, ¶389). In my opinion, this teaching fails to disclose the use of the “expiration of a periodic timer” as a “message delivery trigger” for the following reasons.

102. First, the above passage does not disclose the use of a *timer* at all. Pushing content according to a “schedule of time or event” would encompass, e.g., an application service provider deciding that with Halloween approaching, they may want to push Halloween-related content. An example might be a mobile game developer deciding to update their game application with Halloween content on October 1. This would not relate to the expiration of any timer, but rather simply coincide with the schedule / event of Halloween approaching. Likewise, it would encompass sending system maintenance updates (to the extent they are needed) in the evening at some point after 9pm the day the update is ready to go. This would

not need to be a “timer” at all—it would instead commonly involve an employee of the application service provider triggering the update. Dr. Traynor sets forth no obviousness theory as to why pushing according to a “schedule or event” would involve a “timer.” Pet. Ex. 1003, ¶¶388-392.

103. Additionally, it is my opinion that to the extent pushing content “according to a schedule of time or event” **would** constitute the use of a “timer,” there is no explanation whatsoever of why that “timer” would be implemented as a “**periodic timer**.” In the sole example provided by Munson (“pushing contents[] for a system maintenance purpose during off-peak hours”), there is no suggestion that “system maintenance” would recur in accordance with a given time period such that it would be understood to be “periodic,” nor that the push updates would operate pursuant to a “periodic timer” as a POSITA would understand claim 9 to require. *See generally* Section VI, *supra* (addressing my interpretation of the “periodic timer” claim language).

104. Accordingly, it is my opinion that Dr. Traynor fails to show the obviousness of claim 9 under his Ground 5 theory.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true.

September 7, 2024

A handwritten signature in dark ink, reading "Michael C. Brogioli", written over a horizontal line.

Michael C. Brogioli, Ph.D.