

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Graham Merrett
U.S. Patent No.: 11,012,827 Attorney Docket No. 50095-0266IP1
Issue Date: May 18, 2021
Appl. Serial No.: 17/114,645
Filing Date: December 8, 2020
Title: RANDOM NUMBER DERIVED MESSAGE TRANSMISSION
 TO A THIRD PARTY PROVIDER

Mail Stop Patent Board

Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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MOTION TO WAIVE THE WORD LIMIT
PURSUANT TO 37 C.F.R. § 42.24(a)(2)

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I. INTRODUCTION

Pursuant to 37 C.F.R. §42.24(a)(2), Petitioner Apple Inc. (“Apple”) moves for waiver of the petition word limit set forth in §42.24(a)(1)(i) and consideration or authorization to file the appended extended-length Petition (Appendix A, “Full Petition”) for *inter partes* review (“IPR”) of claims 1-30 of U.S. Patent No. 11,012,827 (“’827 Patent”). Apple is concurrently filing an abridged version of the Petition (“Abridged Petition”) that challenges a subset of the ’827 Patent’s claims—*i.e.*, claims 1, 7, 9, 17-21, 23, and 25-27. The Abridged Petition is less than 14,000 words and complies with the §42.24(a)(1)(i) word limit. The Full Petition exceeds the §42.24(a)(1)(i) word limit by 7,656 words. Apple respectfully requests that this Motion be granted and that the Full Petition be used as the basis for this proceeding in place of the Abridged Petition.¹ Proceeding with the Full Petition is in the interests of justice for each of the reasons addressed herein.

II. THE WORD LIMIT SHOULD BE WAIVED IN THE INTERESTS OF JUSTICE

The ’827 Patent is one of seven patents that HBCU Messaging US LP (“HBCU”) asserts against Apple in *HBCU Messaging US LP v. Apple, Inc. et al.*,

¹ If Apple’s Motion is denied, Apple requests that the Abridged Petition be used as the basis for this proceeding.

1-24-cv-01199 (WDTX) (“the Texas Litigation”). *See* APPLE-1100, APPLE-1102. While HBCU currently asserts claims 1 and 9 in the Texas Litigation, that litigation is still young and Apple does not yet know whether HBCU may later seek to assert additional claims in the Texas litigation including one or more of claims 2-6, 8, 10-16, 22, 24, or 28-30 (the “Additional Claims”) that are not challenged in the Abridged Petition due to insufficient word count. Nor does Apple know if HBCU may later seek to assert any of the Additional Claims in other litigations. Simply put, HBCU has not taken off the table the threat of assertion of any of claims 1-30 of the ’827 Patent against Apple.² Apple thus seeks to waive the word limit to present its invalidity arguments and permit review of each claim in IPR. Apple does not seek to gain an unfair advantage, but simply requests sufficient word

² For example, HBCU’s complaint in the Texas Litigation identifies additional patents in the same family as the ’827 Patent and states that HBCU “reserves the right to assert one or more of these additional patents, for example if discovery shows or confirms that Defendants are infringing them.” APPLE-1100, 6. As HBCU has never stipulated not to assert additional claims of the ’827 Patent itself, HBCU’s posture on assertion of additional claims appears to be the same as its posture on the assertion of additional related patents.

count to permit a single challenge against each claim of the '827 Patent. Even in the Full Petition, Apple challenges each claim only once.

Apple has made a concerted effort to present arguments addressing all claims of the '827 Patent in a single, word-count-compliant petition. But the length and complexity (in terms of number of limitations) of the claims have made it effectively impossible to adequately address them all in less than 14,000 words. Apple thus brings this Motion in view of the insufficiency of the ordinary petition word limit.

To be clear, the word-count problem is uniquely pronounced in the '827 Patent, and indeed, Apple worked diligently to ensure that its petitions on each of the six other patents that HBCU asserts in the Texas Litigation—all of which are related in priority and subject matter to the '827 Patent—all otherwise complied with the standard petition word limit. *See* IPR2025-01493 (U.S. Patent 11,089,450), IPR2025-01488 (U.S. Patent 11,653,182), IPR2025-01486 (U.S. Patent 8,918,127), IPR2026-00107 (U.S. Patent 11,991,601), IPR2026-00105 (U.S. Patent 11,991,600), IPR2026-00104 (U.S. Patent 11,653,183). The '827 Patent is the only one of the seven patents at issue in the Texas Litigation for which Apple seeks an increase to the word limit on its IPR petition. Because all claims of the '827 Patent remain at risk of assertion even as the exceptional claim length and complexity have made compliance with the standard word limit unachievable,

Apple respectfully requests waiver of the word limit in the interests of justice. *See* 37 C.F.R. §42.24(a)(2); *Uber Techs., Inc. v. Surgetech LLC*, IPR2023-00735, Paper 10 (PTAB May 25, 2023) (granting motion to waive petition word limit to accommodate challenges to 20 claims in Full Petition); *Twitter, Inc. v. Palo Alto Research Center Inc.*, IPR2021-01398, Paper 12 at 45-47 (PTAB Mar. 15, 2022) (granting motion to waive petition word limit to accommodate challenges to 18 claims in Full Petition).

A. The Exceptional Length and the Complexity of the '827 Patent's Claims Supports Waiving the Word Limit

As noted above, the exceptional length and complexity of the '827 Patent's claims support Apple's Motion to waive the word limit. To this point, claims 1-30 comprise more than **3,100 words** spanning **7 columns** of text. APPLE-1001, 12:1-18:42. This nearly matches the entire length of the '827 Patent's detailed description ("BEST MODES OF THE INVENTION"), which similarly spans 7 columns of text. *Id.*, 5:20-11:67. The '827 Patent's three independent claims—*i.e.*, claims 1, 28, and 29—comprise **1,993 words** alone. *Id.*, 12:2-13:37 (Claim 1: **764 words**), 15:48-17:43 (Claim 28: **960 words**), 18:1-37 (Claim 29: **269 words**).

The Board has previously recognized the impracticality of challenging claims of such "extraordinary length" in a single petition limited by the standard word count. *See, e.g., Amazon.com, Inc. v. Nokia Technologies Oy*, IPR2024-

01505, Paper 9 at 68-70 (PTAB Mar. 28, 2025). For example, in *Amazon*, the Board permitted the petitioner to split its challenges to claims of a single patent across two petitions because “Although we do not think 30 claims are typically too numerous for one petition to cover, many claims in the ’833 patent are extraordinarily lengthy and include numerous limitations. For example, claim 6, which depends from claim 5, which depends from claim 1, is itself approximately the length of a full column in the ’822 patent in addition to the lengths of claims 1 and 5.” *Id.*, 69-70. By comparison, the total length of claim 6 including the limitations of its base claims 1 and 5 in the patent at issue in *Amazon* was 800 words—i.e., 160 words **shorter** than claim 28 of the ’827 Patent and just 36 words longer than claim 1 of the ’827 Patent. APPLE-1069, 31:32-33:35.

The ’827 Patent claims are also substantially longer than the claims challenged in other cases where the Board has agreed to waive the petition word limit. For example, the Board waived the word limit to permit challenges to a total of 18 claims comprising just 689 words in *Twitter* and waived the word limit to permit challenges to a total of 20 claims comprising just 1,394 words in *Uber*. *Twitter*, IPR2021-01398, Paper 12 at 45-47; *Uber*, IPR2023-00735, Paper 10 at 2-3; APPLE-1070; APPLE-1071. Noticeably, independent claims 1 and 28 of the ’827 Patent are each individually longer than the total length of the 18 claims

challenged in *Twitter*, and claims 1-30 of the '827 Patent are more than twice the length of the 20 claims challenged in *Uber*.

Adding to the difficulty of challenging claims 1-30 in a single, standard-length petition is that the three independent claims of the '827 Patent are meaningfully different from each other, and further, the patent includes 27 unique dependent claims (not merely parallel claim sets). For example, independent claim 1 recites features from the perspective of a “mobile wireless device” while independent claim 29 recites a “method” consistent with the vantage point of a server. Consequently, claims 1 and 29 recite numerous distinct limitations that require separate treatment in the Petition. *Compare* APPLE-1001, 12:2-13:37 (claim 1) *with* 18:1-37 (claim 29). More, while claim 28 recites some overlapping features with claim 1, claim 28 adds limitations in elements [28l], [28q], and [28r] that required an additional prior art reference (“Dorenbosch,” APPLE-1039) to address in the Petition. The Petition’s mapping to claim 1 itself thus requires 9,377 words alone (plus another 1,451 words for an efficient description of the prior art combination applied against claim 1), leaving little room to address additional claims within the 14,000 word limit—let alone two lengthy and meaningfully different independent claims and 27 unique dependent claims.

In addition, the dependent claims recite features that branch in several directions that necessitated presentation of four sub-grounds that each add a

different prior art reference to the base Horvath-Tsampalis-Tumminaro combination. Dorenbosch is relied on to address “an undelivered message parameter” and related features; Kansal is relied on to address “display” on “a single interface” for various types of messages; Cottrell is relied on to address “the message forwarded to the third party provider is not identical to a message transmitted by the mobile wireless device comprising the message content intended for the third party provider” and related features; and Lin is relied on to address “over the air (OTA) configuration,” “short message service (SMS) message for authentication” and related features.

To present arguments as efficiently as possible, Apple has limited its challenges to grounds based on a single primary combination of Horvath, Tsampalis, and Tumminaro. Apple has endeavored not to repeat theories or explanations when claim limitations overlap, and no claim is challenged more than twice based on alternative prior art references or combinations. Yet, 14,000 words is insufficient to address the uncommonly long claims of the '827 Patent. In this context, Apple respectfully submits that an increase of 7,656 words is warranted for the Full Petition to address the Additional Claims of the '827 Patent.

B. Waiving the Word Limit Would Promote Efficient Use of the Board's and the Parties' Resources

The Additional Claims have not yet been challenged by any other petitioner, and waiving the word limit to permit Apple to challenge them here would allow the Board to efficiently resolve related patentability issues for all thirty of the '827 Patent's claims in a single proceeding. Waiver would thus promote efficiency and the public interest in having these questions substantively addressed.

The efficiency gains that would be realized from grant of this Motion and consideration of Apple's challenges to all claims of the '827 Patent are particularly clear here given that Apple's IPR petitions on the other six patents asserted in the Texas Litigation already challenge all claims of these related patents on similar prior art combinations anchored by the same Horvath and Tsampalis references advanced in the '827 Petition. Leaving resolution of validity on prior art patent and printed publication grounds for just a subset of claims of the '827 Patent for district court while other related claims of the '827 and related patents are addressed by the PTAB would be exceedingly inefficient. *See Padagis US LLC v. Neurelis, Inc.*, IPR2025-00465, Paper 12 at 3-4 (July 16, 2025) (explaining that it is an "efficient use of Board resources to address [a] related patent" where similar issues would be raised); *see also Posco Co., LTD. V. Arcelormittal*, IPR2025-00370, Paper 10 at 3 (Jun. 25, 2025) ("[I]t is an appropriate use of Office resources to provide consistency and predictability to the public and to ensure that a patent applicant or owner does not take action inconsistent").

Further, proceeding on the basis of the Full Petition in this IPR would avoid the predictable inefficiencies that would otherwise arise as a result of filing multiple petitions challenging different subsets of claims of the '827 Patent. Multiple proceedings based on parallel petitions typically requires multiple sets of briefings and decisions, and potentially implicates additional depositions and hearings that would be readily streamlined in a single proceeding if the Full Petition were used as the basis for this IPR. Additionally, Apple asks for just 7,656 additional words in this Motion to permit consideration of all thirty claims of the '827 Patent as opposed to the 14,000 additional words attendant to parallel petitions.

Lastly, whether Apple prevails in this proceeding or not, the effort and resources expended by the Parties and the Board in considering the Additional Claims in this single proceeding is likely to save the Parties, the Office, and/or the courts from expending substantially more resources in future separate challenges to the Additional Claims.

C. Waiving the Word Limit is in the Interests of Justice to Permit Consideration of Apple's Challenges to Additional Claims That HBCU May Belatedly Assert

HBCU has not yet asserted the Additional Claims against Apple, but the possibility that HBCU may do so in the future risks a substantial injustice to Apple if this Motion is denied. For example, if HBCU later asserts any of the Additional

Claims past 35 U.S.C. §315(b)'s one-year bar in November 2025, denial of this Motion would effectively deny Apple's opportunity to challenge such belatedly asserted claims in an IPR. This, in turn, would deprive Apple of the "quick and cost-effective alternative[] to litigation" intended by Congress (*e.g.*, H.R. Rep. No. 112-98, pt.1, 40 (2011), 2011 U.S.C.C.A.N. 67, 69), and could require the Parties to address similar validity issues on the Additional Claims in other forums.

III. CONCLUSION

For the reasons addressed above, Apple respectfully requests waiver of the petition word limit set forth in 37 C.F.R. § 42.24(a)(1)(i) and asks that the Office consider the Full Petition appended to this Motion.

If this Motion is Granted, Apple would be amenable to equitable increases in the word limits of the principal briefs for both parties in this proceeding including the Patent Owner's Preliminary Response, Patent Owner's Response, Petitioner's Reply, and Patent Owner's Sur-Reply.

Respectfully submitted,

Dated: November 4, 2025

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CERTIFICATION UNDER 37 CFR §42.24

Pursuant to 37 CFR §42.24, the undersigned certifies that this Motion complies with the 15-page limit of 37 CFR §42.24(a)(v).

Respectfully submitted,

Dated: November 4, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on November 4, 2025, a complete and entire copy of this Motion to Waive the Word Limit was provided via Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

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APPENDIX A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Graham Merrett
U.S. Patent No.: 11,012,827 Attorney Docket No. 50095-0266IP1
Issue Date: May 18, 2021
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**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 11,012,827 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

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LIST OF EXHIBITS

APPLE-1001	U.S. Patent No. 11,012,827 (“the ’827 Patent”)
APPLE-1002	File History of U.S. Patent No. 11,012,827
APPLE-1003	Expert Declaration of Dr. Patrick Traynor, Ph.D.
APPLE-1004	U.S. Pub. No. 2007/0254681 (“Horvath”)
APPLE-1005	U.S. Pub. No. 2004/0203956 (“Tsampalis”)
APPLE-1006	[RESERVED]
APPLE-1007	Chatterjee et al., “Instant Messaging and Presence Technologies for College Campuses.” IEEE Network, May/June 2005. (“Chatterjee”)
APPLE-1008	U.S. Pub. No. 2005/0243978 (“Son”)
APPLE-1009	UK Pub. No. 2432482 (“Beaumont”)
APPLE-1010	[RESERVED]
APPLE-1011	U.S. Patent No. 6,940,844 (“Purkayastha”)
APPLE-1012	U.S. Patent No. 7,702,342 (“Duan”)
APPLE-1013	U.S. Patent No. 8,819,145 (“Gailloux”)
APPLE-1014-1016	[RESERVED]
APPLE-1017	U.S. Patent No. 9,167,401 to (“Helferich”)
APPLE-1018-1020	[RESERVED]
APPLE-1021	U.S. Patent No. 8,006,190 (“Quoc”)
APPLE-1022-1024	[RESERVED]
APPLE-1025	Qi et al., “Multimedia Messaging Service” (July 2004), available at https://www.zte.com.cn/global/about/magazine/zte-communications/2004/1/en_68/162264.html

APPLE-1026	RFC 3261 – SIP: Session Initiation Protocol (June 2002), <i>available at</i> http://www.faqs.org/rfcs/rfc3261.html .
APPLE-1027-1031	[RESERVED]
APPLE-1032	U.S. Pub. No. 2008/0261577 (“Celik”)
APPLE-1033	U.S. Provisional Application No. 60/913,187 (“Celik Provisional”)
APPLE-1034	U.S. Pub. No. 2007/0233615 (“Tumminaro”)
APPLE-1035	EP Pub. No. 1662812 (“Empower”)
APPLE-1036	International Pub. No. WO 2007/052264 (“Agiv”)
APPLE-1037	T-Mobile webpage https://www.t-mobile.com/home- internet/the-signal/internet-help/the-complete-wifi-history
APPLE-1038	[RESERVED]
APPLE-1039	U.S. Pub. No. 2002/0173308 (“Dorenbosch”)
APPLE-1040	PCT Pub. 2005/001660 (“Cottrell”)
APPLE-1041	U.S. Pub. No. 2005/0233737 (“Lin”)
APPLE-1042	U.S. Pub. No. 2005/0198124 (“McCarthy”)
APPLE-1043	RFC 2778 – A Model for Presence and Instant Messaging (Feb. 2000, <i>available at</i> https://datatracker.ietf.org/doc/html/rfc2778
APPLE-1044	RFC 3428 – Session Initiation Protocol (SIP) for Instant Messaging (December 2002), <i>available at</i> https://datatracker.ietf.org/doc/html/rfc3428
APPLE-1045	Open Mobile Alliance, Multimedia Messaging Service Encapsulation Protocol, Approved Version 1.2 (March 1, 2005), <i>available at</i> https://www.openmobilealliance.org/release/MMS/V1_2- 20050301-A/OMA-MMS-ENC-V1_2-20050301-A.pdf
APPLE-1046	U.S. Patent. No. 9,467,530 (“Belimpasakis”)

- APPLE-1047 Krakow, Wireless Industry Pushes TV for Your Cell Phone, NBC News (Feb. 14, 2006), *available at* <https://www.nbcnews.com/id/wbna11345651>
- APPLE-1048 3G/UMTS Towards Mobile Broadband and Personal Internet, A White Paper from The UMTS Forum (October 2005), *available at* https://www.3gpp.org/ftp/pcg/pcg_15/docs/pdf/PCG15_22.pdf
- APPLE-1049 ETSI TS 133.203 v7.3.0, Digital Cellular Telecommunications System (Phase 2+); Universal Mobile Telecommunications System (UMTS); 3G Security; Access Security for IP-based Services (Sept. 2006), *available at* https://www.etsi.org/deliver/etsi_ts/133200_133299/133203/07.03.00_60/ts_133203v070300p.pdf
- APPLE-1050 U.S. Patent No. 7,069,008 (“Hill”)
- APPLE-1051 U.S. Pub. No. 2005/0125547 (“Ahonen”)
- APPLE-1052 U.S. Patent No. 9,036,620 (“Procopio”)
- APPLE-1053 U.S. Pub. No. 2008/0153459 (“Kansal”)
- APPLE-1054 U.S. Pub. No. 2005/0002407 (“Shaheen”)
- APPLE-1055 U.S. Pub. No. 2008/0198811 (“Deshpande”)
- APPLE-1056 U.S. Pub. No. 2006/0282518 (“Karaoguz”)
- APPLE-1057 U.S. Pub. No. 20070110076 (“Brouwer”)
- APPLE-1058 Le Bodic, Mobile Messaging Techs. and Services: SMS, EMS and MMS, Wiley Press (2nd Ed.) (2005)
- APPLE-1059 WIRELESS Waypoint, Understanding SS7 and Intelligent Networks, *available at* <https://wirelesswaypoint.com/understanding-ss7-and-intelligent-networks>
- APPLE-1060 U.S. Patent No. 8,190,878 (“Stern”)
- APPLE-1061 U.S. Pub. No. 2008/0293378 (“Hinton”)

APPLE-1062	Merriam-Webster Dictionary – “Subscribe”
APPLE-1063	RFC 2779 – Instant Messaging / Presence Protocol Requirements, <i>available at</i> https://www.rfc-editor.org/rfc/pdf/rfc2779.txt.pdf
APPLE-1064	RFC 3856 – A Presence Event Package for the Session Initiation Protocol (SIP), <i>available at</i> https://www.rfc-editor.org/rfc/pdf/rfc3856.txt.pdf
APPLE-1065	U.S. Pub. No. 2008/0120427 (“Ramanathan”)
APPLE-1066	Trillian Pro v1.0 webpage (“Trillian”)
APPLE-1067	U.S. Pub. No. 2007/0004461 (“Bathina”)
APPLE-1068	U.S. Pub. 2006/0025126 (“Lu”)
APPLE-1069	U.S. Patent No. 9,571,833 (“Bici”)
APPLE-1070	U.S. Patent No. 11,334,598 (“Loch”)
APPLE-1071	U.S. Patent No. 7,043,475 (“Heer”)
APPLE-1072-1099	[RESERVED]
APPLE-1100	Complaint, <i>HBCU Messaging US LP v. Apple, Inc. et al.</i> , 1-24-cv-01199 (WDTX) (Oct. 7, 2024)
APPLE-1101	Infringement Charts of the ’827 Patent
APPLE-1102	Summons in a Civil Action and Certification of Service of Summons and Complaint, <i>HBCU Messaging US LP v. Apple, Inc. et al.</i> , 1-24-cv-01199 (WDTX) (Nov. 5, 2024)

LISTING OF CLAIMS

Claim 1	
1pre	A mobile wireless device that transmits (i) at least some messages to at least some recipient devices that correspond to subscribers of a service for receiving packet-switched messages, wherein the service includes a server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, and (ii) at least some messages over a cellular network to at least some recipient devices that do not correspond to subscribers of the service, the mobile wireless device comprising:
1a	a wireless local area network (WLAN) transceiver that transmits messages from the mobile wireless device to a WLAN base station and subsequently over the Internet to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, before delivery to a recipient device;
1b	a cellular transceiver that transmits messages from the mobile wireless device to a cellular base station before delivery to a recipient device, wherein the cellular transceiver and the cellular base station communicate using a radio communications protocol that supports transmission of multimedia messages comprising at least one of images, audio clips or videos;
1c	wherein the mobile wireless device connects via the WLAN base station to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;
1d	wherein the mobile wireless device connects via the cellular base station to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;

1e	wherein the mobile wireless device transmits packet-switched messages using a packet-switched bearer supported by the WLAN base station and transmits packet-switched messages using a packet-switched bearer supported by the cellular base station; and
1f	a message client that retrieves, from a message, information corresponding to at least one mobile phone number of a wireless device of an addressed recipient;
1g	wherein the WLAN transceiver: (i) transmits a request, including at least information corresponding to the mobile phone number of the wireless device of the addressed recipient, via the WLAN base station and the Internet, to a server that maintains a subscriber list, to determine whether the wireless device of the addressed recipient corresponds to a subscriber of the service; and
1h	(ii) receives a response from the server that maintains the subscriber list, via the WLAN base station and the Internet, indicating whether the wireless device of the addressed recipient corresponds to a subscriber of the service, wherein a negative response indicates that the wireless device of the addressed recipient is not a subscriber of the service;
1i	wherein the mobile wireless device selects a packet-switched bearer for transmission of a message to the addressed recipient via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the service;
1j	wherein if a packet-switched bearer is selected for message transmission via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, the mobile wireless device chooses for message transmission the packet-switched bearer supported by the WLAN base station or the packet-switched bearer supported by the cellular base station;

1k	wherein the mobile wireless device transmits a message to the addressed recipient via the cellular base station, at least where the packet-switched bearer supported by the WLAN base station is not chosen for message transmission;
1l	wherein the mobile wireless device transmits a message to the addressed recipient via the cellular base station, and without traversing the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, before delivery to the addressed recipient, based at least in part on the response failing to indicate that the addressed recipient corresponds to a subscriber of the service;
1m	wherein the mobile wireless device transmits a message limited to one or more binary-encoded characters to the addressed recipient via the cellular base station and through a short message service center (SMSC) before delivery to the addressed recipient, based at least in part on the response failing to indicate that the addressed recipient corresponds to a subscriber of the service;
1n	wherein the mobile wireless device transmits message content intended for a third party provider, to a server associated with the service, which forwards a message comprising the message content intended for the third party provider, to the third party provider, wherein the message forwarded to the third party provider is derived at least in part from a random number.
Claim 2	
2	The mobile wireless device of claim 1, wherein the mobile wireless device selects a packet-switched bearer for transmission of a message to the addressed recipient via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the service and based at least in part upon a status indicating that an undelivered message parameter has not been exceeded.

Claim 3	
3	The mobile wireless device of claim 1, wherein the mobile wireless device transmits a message limited to one or more binary-encoded characters to the addressed recipient via the cellular base station and through a short message service center (SMSC) before delivery to the addressed recipient, based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the service and based at least in part on a status indicating that an undelivered message parameter has been exceeded.
Claim 4	
4	The mobile wireless device of claim 1, wherein the message forwarded to the third party provider is not identical to a message transmitted by the mobile wireless device comprising the message content intended for the third party provider.
Claim 5	
5	The mobile wireless device of claim 4, wherein the message transmitted by the mobile wireless device comprising the message content intended for the third party provider includes at least one information element which is not included in the message forwarded to the third party provider.
Claim 6	
6	The mobile wireless device of claim 5, wherein the information element is a phone number of the mobile wireless device.
Claim 7	
7	The mobile wireless device of claim 1, wherein the message limited to one or more binary-encoded characters is further limited to less than a maximum allowable number of binary-encoded characters.
Claim 8	

8	The mobile wireless device of claim 1, wherein a message to the addressed recipient is queued for later delivery using the service if the wireless device of the addressed recipient corresponds to a subscriber of the service, and the wireless device of the addressed recipient, at a time of message transmission, is unable to connect to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service.
Claim 9	
9pre	The mobile wireless device of claim 1, further comprising:
9a	a display that displays presence information associated with the wireless device of the addressed recipient;
9b	wherein the mobile wireless device receives the presence information associated with the wireless device of the addressed recipient if the wireless device of the addressed recipient corresponds to a subscriber of the service.
Claim 10	
10	The mobile wireless device of claim 1, wherein the mobile wireless device receives an over the air (OTA) configuration message which includes at least one parameter for establishing a server connection with the server associated with the service which forwards the message comprising the message content intended for the third party provider.
Claim 11	
11pre	The mobile wireless device of claim 1,
11a	wherein the request is encapsulated in hypertext transfer protocol (HTTP) and a message to the addressed recipient is encapsulated in HTTP;
11b	wherein the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service is located outside of the cellular network;

11c	wherein the server that maintains the subscriber list is located outside of the cellular network.
Claim 12	
12	The mobile wireless device of claim 1, wherein the message client retrieves information representative of at least one electronic mail (email) address of another wireless device of another recipient; wherein the addressed recipient and the another recipient are each a subscriber of the service.
Claim 13	
13	The mobile wireless device of claim 12, wherein the WLAN transceiver transmits at least one message from the mobile wireless device to the wireless device of the addressed recipient and to the wireless device of the another recipient.
Claim 14	
14	The mobile wireless device of claim 1, wherein the wireless device transmits a short message service (SMS) message for authentication to the service.
Claim 15	
15pre	The mobile wireless device of claim 1,
15a	wherein the mobile wireless device is authenticated to the service via SMS;
15b	wherein the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service is located outside of the cellular network;
15c	wherein the server that maintains the subscriber list is located outside of the cellular network.
Claim 16	

16	The mobile wireless device of claim 1, further comprising: wherein the mobile wireless device registers a user name tag or handle with the service, wherein the mobile wireless device transmits an authentication identifier for authentication to the service.
Claim 17	
17	The mobile wireless device of claim 1, wherein the mobile wireless device receives an indication that the wireless device of the addressed recipient is authenticated to the service.
Claim 18	
18	The mobile wireless device of claim 1, wherein the mobile wireless device is not enabled to transmit messages via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service before authentication of the mobile wireless device to the service.
Claim 19	
19	The mobile wireless device of claim 1, wherein the mobile wireless device transmits location information.
Claim 20	
20	The mobile wireless device of claim 19, wherein the message forwarded to the third party provider is derived at least in part from the location information.
Claim 21	
21	The mobile wireless device of claim 1, wherein the mobile wireless device is authenticated to the service, via a mobile phone number of the mobile wireless device, prior to receiving the response.
Claim 22	
22pre	The mobile wireless device of claim 1, further comprising:
22a	a single interface for transmission of and reception of both text and multimedia messages;

22b	wherein the single interface provides an option to add a voice attachment for subsequent playback by the wireless device of the addressed recipient.
Claim 23	
23	The mobile wireless device of claim 1, wherein the message limited to one or more binary-encoded characters is a signaling system 7 (SS7) message.
Claim 24	
24	The mobile wireless device of claim 1, wherein the message client provides an option to add one or more attachments based at least in part on the response.
Claim 25	
25	The mobile wireless device of claim 1, wherein a negative response is consistent with the addressed recipient being unknown to the server that maintains the subscriber list.
Claim 26	
26	The mobile wireless device of claim 1, wherein the random number is generated by the server associated with the service which forwards the message comprising the message content intended for the third party provider.
Claim 27	
27	The mobile wireless device of claim 1, wherein the multimedia messages comprising at least one of images, audio clips or videos are multimedia message service (MMS) messages.
Claim 28	
28pre	A system comprising:
28a	a mobile wireless device; and

28b	a server that receives message content intended for a third party provider, from the mobile wireless device;
28c	wherein the mobile wireless device transmits (i) at least some messages to at least some recipient devices that correspond to subscribers of a service for receiving packet-switched messages, wherein the service includes a server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, and (ii) at least some messages over a cellular network to at least some recipient devices that do not correspond to subscribers of the service;
28d	wherein the mobile wireless device comprises a wireless local area network (WLAN) transceiver that transmits messages from the mobile wireless device to a WLAN base station and subsequently over the Internet to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, before delivery to a recipient device;
28e	wherein the mobile wireless device comprises a cellular transceiver that transmits messages from the mobile wireless device to a cellular base station before delivery to a recipient device, wherein the cellular transceiver and the cellular base station communicate using a radio communications protocol that supports transmission of multimedia messages comprising at least one of images, audio clips or videos;
28f	wherein the mobile wireless device connects via the WLAN base station to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;
28g	wherein the mobile wireless device connects via the cellular base station to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;

28h	wherein the mobile wireless device transmits packet-switched messages using a packet-switched bearer supported by the WLAN base station and transmits packet-switched messages using a packet-switched bearer supported by the cellular base station; and
28i	wherein the mobile wireless device comprises a message client that retrieves, from a message, address information consisting of only one mobile phone number of a wireless device of an addressed recipient, during composition of the message;
28j	wherein the WLAN transceiver: (i) transmits a request, including at least information corresponding to the mobile phone number of the wireless device of the addressed recipient, via the WLAN base station and the Internet, to a server that maintains a subscriber list, to determine whether the wireless device of the addressed recipient corresponds to a subscriber of the service; and
28k	(ii) receives a response from the server that maintains the subscriber list, via the WLAN base station and the Internet, indicating whether the wireless device of the addressed recipient corresponds to a subscriber of the service, wherein a negative response indicates that the wireless device of the addressed recipient is not a subscriber of the service;
28l	wherein the mobile wireless device selects a packet-switched bearer for transmission of a message to the addressed recipient via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the service and based at least in part upon a status indicating that an undelivered message parameter has not been exceeded;

28m	wherein if a packet-switched bearer is selected for message transmission via the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, the mobile wireless device chooses for message transmission the packet-switched bearer supported by the WLAN base station or the packet-switched bearer supported by the cellular base station;
28n	wherein if the mobile wireless device chooses the packet-switched bearer supported by the WLAN base station for message transmission, the mobile wireless device performs message transmission to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;
28o	wherein the mobile wireless device transmits a message to the addressed recipient via the cellular base station, at least where the packet-switched bearer supported by the WLAN base station is not chosen for message transmission;
28p	wherein the mobile wireless device transmits a message to the addressed recipient via the cellular base station, and without traversing the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service, before delivery to the addressed recipient, based at least in part on the response failing to indicate that the addressed recipient corresponds to a subscriber;
28q	wherein the mobile wireless device transmits a message limited to one or more binary-encoded characters to the addressed recipient via the cellular base station and through a short message service center (SMSC) before delivery to the addressed recipient, based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the service and based at least in part on a status indicating that an undelivered message parameter has been exceeded;

28r	wherein a message to the addressed recipient is queued for later delivery using the service if the wireless device of the addressed recipient corresponds to a subscriber of the service having a status indicating that an undelivered message parameter has not been exceeded, and the wireless device of the addressed recipient, at a time of message transmission, is unable to connect to the server that receives packet-switched messages transmitted via the service to recipient devices that correspond to subscribers of the service;
28s	wherein the server that receives the message content intended for the third party provider forwards a message comprising the message content intended for the third party provider, to the third party provider, wherein the message forwarded to the third party provider is derived at least in part from a random number.
Claim 29	
29pre	A method comprising:
29a	receiving, from a first mobile wireless device via the Internet, a subscription message for subscribing the first mobile wireless device to a service for receiving packet-switched messages other than short message service (SMS) messages, enhanced messaging service (EMS) messages and multimedia message service (MMS) messages;
29b	storing information indicating that a first mobile phone number of the first mobile wireless device corresponds to a subscriber of the service, in a subscriber data store;
29c	receiving a first request, from a second mobile wireless device, the first request including at least information corresponding to the first mobile phone number of the first mobile wireless device;
29d	determining, via the subscriber data store, in response to receiving the first request, that the first mobile phone number of the first mobile wireless device corresponds to a subscriber of the service;

29e	transmitting a first response, to the second mobile wireless device, indicating that the first mobile wireless device corresponds to a subscriber of the service;
29f	receiving a second request, from the second mobile wireless device, the second request including at least information corresponding to another phone number; and
29g	transmitting a second response, to the second mobile wireless device, indicating that the another phone number does not correspond to a subscriber of the service;
29h	wherein a server associated with the service receives message content intended for a third party provider, from the second mobile wireless device, and forwards a message comprising the message content intended for the third party provider, to the third party provider, wherein the message forwarded to the third party provider is derived at least in part from a random number.
Claim 30	
30	The method of claim 29, wherein the server associated with the service does not receive message content intended for the third party provider from another mobile wireless device associated with the another phone number.

I. INTRODUCTION

Apple Inc. (“Apple” or “Petitioner”) petitions for IPR of claims 1-30 (“Challenged Claims”) of U.S. Patent No. 11,012,827 (“the ’827 Patent”).

II. REQUIREMENTS FOR IPR

A. Grounds for Standing

Apple Inc. certifies the ’827 Patent is available for IPR. This Petition is filed within one year of service of the complaint’s service in *HBCU Messaging US LP v. Apple, Inc. et al.*, 1-24-cv-01199 (WDTX). APPLE-1102. Petitioner is not barred or estopped from requesting this review.

B. Challenge and Relief Requested

Petitioner requests institution of IPR and cancellation of the Challenged Claims based on the following grounds:

Ground	’827 Patent Claims	§ 103 Basis
1A	1, 7, 11, 16-21, 23, 25-27, 29-30	Horvath-Tsampalis-Tumminaro
1B	9, 12-13, 22, 24	Horvath-Tsampalis-Tumminaro-Kansal
1C	2-3, 8, 28	Horvath-Tsampalis-Tumminaro-Dorenbosch
1D	4-6	Horvath- Tsampalis-Tumminaro-Cottrell
1E	10, 14-15	Horvath-Tsampalis-Tumminaro-Lin

Grounds 1A-1E are further supported by the expert testimony of Dr. Patrick Traynor (APPLE-1003) and cited corroborating evidence.

The '827 Patent claims priority through multiple intervening applications to a pair of Australian applications, the earliest filed on July 24, 2007. APPLE-1001, Cover, 1:5-27. Petitioner does not concede that any of the Challenged Claims are entitled to the benefit of the alleged priority-application filing dates, but treats July 24, 2007, as the Critical Date solely for purposes of the analysis in this Petition. APPLE-1003, ¶¶17-18.

Reference	Filing Date	Publication Date	Pre-AIA Prior Art Status
Horvath (APPLE-1004)	May 1, 2006	Nov. 1, 2007	§102(e)
Tsampalis (APPLE-1005)	Dec. 31, 2002	Oct. 14, 2004	§§102(a)-(b), (e)
Tumminaro (APPLE-1034)	Mar. 30, 2007	Oct. 4, 2007	§102(e)
Dorenbosch (APPLE-1039)	May 15, 2001	Nov. 21, 2002	§§102(a)-(b), (e)
Kansal (APPLE-1053)	Dec. 19, 2006	Jun. 26, 2008	§102(e)
Lin (APPLE-1041)	Mar. 28, 2005	Oct. 20, 2005	§§102(a)-(b), (e)
Cottrell (APPLE-1040)	Jun. 25, 2004	Jan. 6, 2005	§§102(a)-(b), (e)

Horvath, Tsampalis, Tumminaro, Dorenbosch, Kansal, Lin, and Cottrell are all analogous art, each in the field of endeavor (mobile messaging over wireless networks) and reasonably pertinent to the problems said to be addressed by the '827 Patent. APPLE-1001, Title, Abstract; APPLE-1004, Title, Abstract; APPLE-1005, Title, Abstract; APPLE-1053, Abstract; APPLE-1034, Title, Abstract,

[0031]; APPLE-1039, Abstract; APPLE-1040, Abstract; APPLE-1041, Title, Abstract; *infra*, §§IV.A-E; *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Like the '827 Patent, Horvath, Tsampalis, Tumminaro, Dorenbosch, Kansal, Lin, and Cottrell each seek to provide users with a wider range of messaging options. APPLE-1001, 3:18-25; *See* APPLE-1004, [0009]; APPLE-1005, [0065]; APPLE-1039, [0002]; APPLE-1053, [0009]; APPLE-1034, Title, Abstract, [0031]; APPLE-1041, Abstract, [0017]-[0018]; APPLE-1040, [0018], [0009]; APPLE-1003, ¶24.

C. Level of Ordinary Skill in the Art

A person of ordinary skill in the art relating to the subject matter of the '827 Patent as of the Critical Date ("POSITA") would have had at least a bachelor's degree in computer science, electrical engineering, computer engineering, or a related field, with 2-3 years of industry experience in computer networking and wireless telecommunications. APPLE-1003, ¶21. Additional graduate education could substitute for professional experience, and *vice versa*. *Id.*

III. SUMMARY OF THE '827 PATENT

A. Brief Description

The '827 Patent generally describes techniques for messaging over wireless networks in which a wireless device selects a bearer for sending a message based on information indicating whether an intended recipient of the message is a

subscriber of a service for receiving messages via a packet-switched messaging service. APPLE-1001, 2:31-3:2, 7:45-9:57, Abstract; APPLE-1003, ¶¶24-25. FIG. 1 is a diagram of an example messaging system in the '827 Patent:

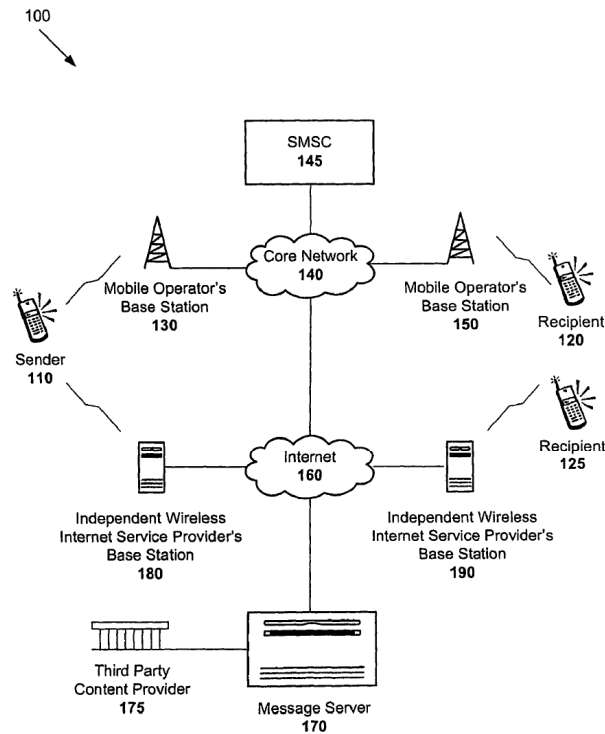


FIG. 1

APPLE-1001, FIG. 1

B. Prosecution History

No prior-art rejections were discussed during prosecution of the application underlying the '827 Patent. The only rejection—obviousness-type double patenting—was withdrawn following the applicant's submission of a terminal disclaimer. APPLE-1002, 21-22, 50-54; APPLE-1003, ¶26.

C. Claim Construction

All claim terms should be construed according to the *Phillips* standard.

Phillips v. AWH Corp., 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100.

Petitioner submits that no formal constructions are presently necessary for purposes of demonstrating obviousness of the Challenged Claims based on Grounds 1A-1E of the Petition. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“claim terms need only be construed to the extent necessary to resolve the controversy”) (internal quotations omitted). Indeed, this Petition demonstrates that the prior art renders obvious the Challenged Claims when applied in a manner consistent with disclosures found in the ’827 Patent itself or Patent Owner’s allegations of infringement before the district court. *See generally* APPLE-1101.

IV. THE CHALLENGED CLAIMS ARE UNPATENTABLE

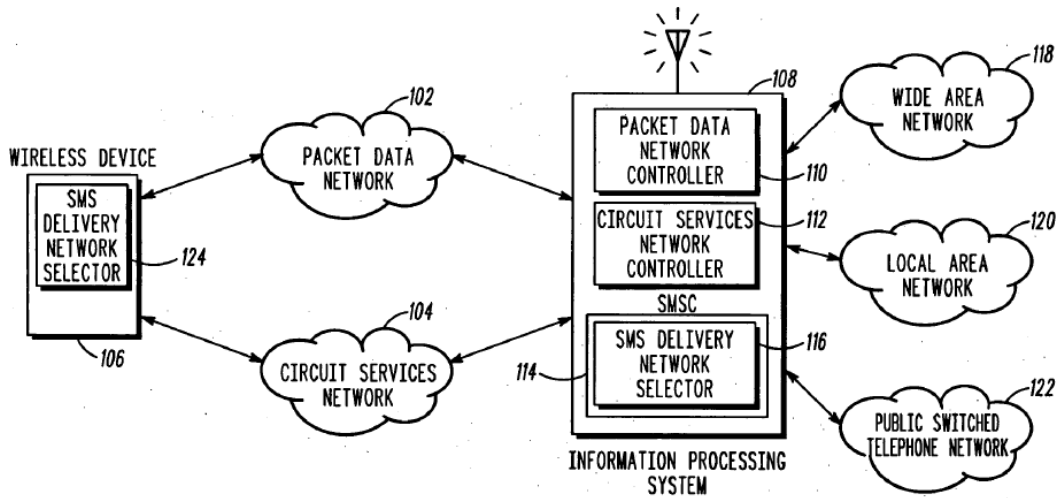
A. GROUND 1A – Horvath-Tsampalis-Tumminaro Renders Obvious Claims 1, 7, 11, 16-21, 23, 25-27, and 29-30

1. Proposed Combination

(a) Horvath¹ (APPLE-1004)

Horvath discloses techniques for “transmitting short message service messages” with “a wireless device” over “a packet data network 102 and a circuit services network 104.” *See e.g.*, APPLE-1004, Title, [0001]-[0002], [0007], [0024]-[0026], [0033], FIGS. 1, 2. Horvath’s wireless device (*e.g.*, “wireless device 106”) is “a dual mode device capable of communicating on either the packet data network 102 or the circuit services network 104,” “based on [a] registration status of the wireless device.” APPLE-1004, [0007]-[0008], [0024], [0061], FIGS. 1 (below), 2, 4; APPLE-1003, ¶¶28-32.

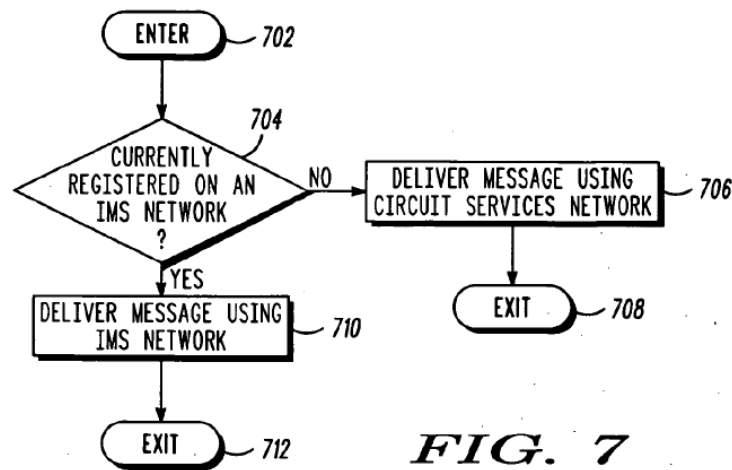
¹ General descriptions provided for this and other references and combinations are incorporated into each subsection and mapping of the claims that includes citations to these references. All emphasis is added unless otherwise indicated.



100
FIG. 1

APPLE-1004, FIG. 1

To send an SMS message (operating as a sender device), “the wireless device 106 first determines if it is registered on the packet data network 102,” and based on this determination, an “SMS delivery network selector 124” on the sender wireless device 106 “selects a network 102, 104 for the wireless device 106 to transmit [the] SMS message on.” APPLE-1004, [0050], [0062], [0078], FIGS. 1, 4, 7.



APPLE-1004, FIG. 7 (sender device perspective)

Although Horvath focuses on selectively using packet-switched or circuit-switched bearers for transmitting and delivering SMS messages, Horvath notes that wireless device 106 can transmit other message types as well, including enhanced messaging service (“EMS”) messages, multimedia service (“MMS”) messages, and instant messages (“IM”). APPLE-1004, [0025], [0038]-[0039]. Transmissions for instant messaging, MMS, and packet-switched SMS are supported by an “Internet Protocol multimedia subsystem” (IMS). *Id.*, [0039] (“An IMS system also includes application servers that host and execute services for the wireless device 106. A service for example, is SMS, MMS, ...and the like.”). A session initiation protocol (“SIP”) network operates over the packet-data network 102 to facilitate communication session signaling and to route SIP MESSAGEs containing embedded content such as SMS, MMS, or IM messages between

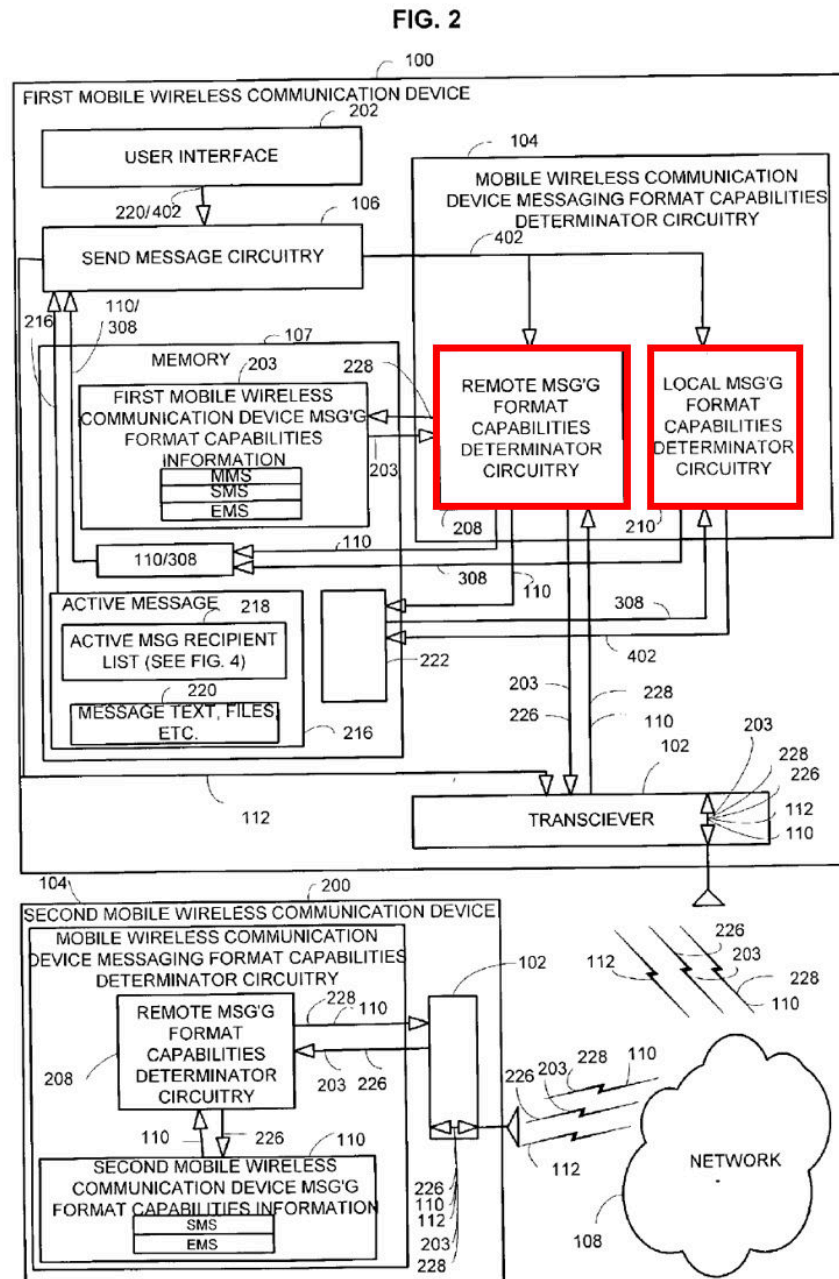
endpoint devices.² *Id.* [0041], [0033], [0050], FIG. 5; *see also id.*, [0002], [0065], [0008]-[0009], [0021], [0028], [0033]-[0039], [0045]-[0047], [0053], [0075]-[0077], FIGs. 1-3, 6.

(b) Tsampalis (APPLE-1005)

Tsampalis describes “wireless messaging” techniques where a first mobile wireless communication device 100 (*i.e.*, a sender device) obtains, either locally or via “a web server” or other “network element” in response to a request, “messaging format capabilities information 110” of a second mobile wireless communication device 200 (*i.e.*, a recipient device) before the sender device sends a message. *See e.g.*, APPLE-1005, Title, Abstract, [0029]-[0039], FIGS. 1, 2 (below, highlighting the local and remote messaging format capabilities determinator circuitries residing on the first wireless device), 5-7. The messaging format capabilities information 110 (MFCI) specifies the types of messages (*e.g.*, SMS, MMS, EMS) that the intended recipient device is capable of processing.

² The SIP network is supported by an “Internet Protocol multimedia subsystem” (IMS) core and is capable of transmitting rich multimedia data. APPLE-1004, [0034]; *see also* APPLE-1012 (describing IMS networks in further detail); APPLE-1003, ¶31.

APPLE-1005, [0022]-[0024]; *see also id.*, [0027], [0034], [0039], [0041]-[0042], [0056]-[0064], FIGs. 5-6, 13; APPLE-1003, ¶¶33-36.



APPLE-1005, FIG. 2 (annotated)

(c) Tumminaro (APPLE-1034)

Tumminaro describes “a mobile payment system where consumers may conduct transactions using a mobile device such as a mobile telephone, smartphone, personal digital assistant or similar portable wireless handheld device.” APPLE-1034, Abstract. “Transactions may be requested through any number of means including SMS messaging, Web, e-mail, instant messenger, a mobile client application, an instant messaging plug-in application or ‘widget.’” *Id.*, [0031], [0350]; *see also id.*, [0202], [0205]-[0206], [0607]-[0608]. Transaction requests are sent from a sending mobile phone “to [a] mobile operator” and are “then routed to [a] payment server through a secure Internet connection.” *Id.*, [0202]; APPLE-1003, ¶37.

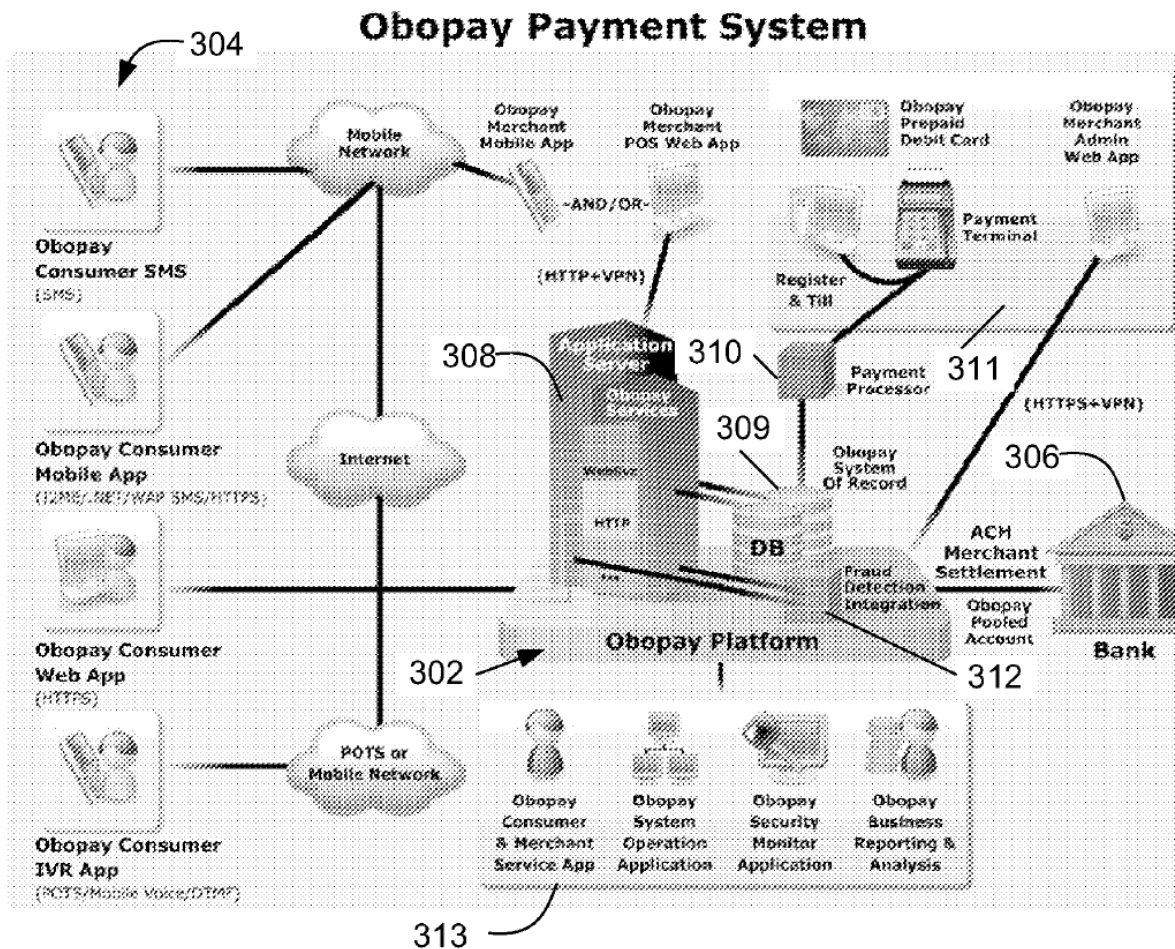


Fig. 3

APPLE-1034, FIG. 3

(d) **The Horvath-Tsampalis-Tumminaro Combination**

A POSITA would have reasonably expected success implementing the below combinations, especially since the resulting system could be implemented with conventional software and hardware techniques (*e.g.*, general-purpose

processors on mobile devices executing programmable instructions) with commonly implemented messaging formats (*e.g.*, SMS, MMS, IM). *KSR* at 401; APPLE-1003, ¶¶53, 59.

(i) Tsampalis’s Message-Format-Capabilities Determination

It would have been obvious to apply Tsampalis’s techniques for using an intended recipient’s messaging-capabilities information to format and transmit messages to the intended recipient according to a selected messaging format (*e.g.*, SMS, MMS, EMS, IM) within the recipient’s messaging capabilities. APPLE-1003, ¶¶47-48; *supra*, §IV.A.1(a)-(b). The system resulting from the Horvath-Tsampalis combination would predictably improve Horvath’s multi-modal messaging environment by ensuring message formats were more often selected for transmission that the recipient was capable of processing. *Id.* Indeed, multiple reasons would have prompted a POSITA to pursue the combination. *Id.*

First, a POSITA would have applied Tsampalis’s techniques in Horvath’s system to “enhance a user’s experience” and better ensure that the format of outgoing messages is compatible with the messaging-format capabilities of the recipients’ devices before a message is sent. APPLE-1003, ¶49; APPLE-1005, [0065]. Tsampalis expressly acknowledges these techniques’ benefits. APPLE-1005, [0065]. Horvath also already considers the challenge of encoding in

different network standards, which would further prompt a POSITA to combine with Tsampalis for teachings on formatting compatibility. *See e.g.*, APPLE-1004, [0050] (describing message encoding using “IS-637” SMS encapsulated in a SIP MESSAGE versus encoding and transmission according to “ANSI-41” procedures).

Second, the combination would allow the sender to make more frequent and reliable use of enhanced-messaging formats such as MMS and IM. Formats such as MMS and IM generally offer richer-messaging capabilities than SMS, such as support for extended character counts for longer messages and the ability to attach/include multimedia files with the message. APPLE-1003, ¶50 (citing APPLE-1007, p. 8; APPLE-1025, Intro.).

Third, the combination would advance Horvath’s express objectives of reducing “unnecessary overhead for the system” and “dynamic optimization of [] resources.” APPLE-1004, [0004], [0081]; APPLE-1003, ¶51.

Fourth, the combination merely involves the application of a known technique to a known system to achieve predictable results. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (a supposed invention that “simply arranges old elements with each performing the same function it had been known to perform” is obvious); *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380-81, (Fed. Cir. 2023). Tsampalis recognized a known problem with dynamic-

messaging environments like Horvath’s—users have different messaging-format capabilities—and Tsampalis’s teachings would address this problem in a straightforward manner well within the POSITA’s skill. APPLE-1003, ¶52.

**(ii) Tumminaro’s Mobile Messaging for
Mobile Payment Transactions**

It would have been obvious to further modify the Horvath-Tsampalis system to implement Tumminaro’s techniques for conducting transactions (*e.g.*, payment transactions) using mobile messaging services (*e.g.*, SMS, MMS, IM) to communicate transaction parameters to a third-party provider. APPLE-1003, ¶54; *supra*, §IV.A.1(a), (c), (d)(i). Multiple reasons would have prompted a POSITA to make the combination. APPLE-1003, ¶54.

First, a POSITA would have used Tumminaro’s teachings to beneficially achieve “a mobile payment system (MPS) or mobile person-to-person payment system that allows fast and easy money transactions.” APPLE-1034, [0032]. Tumminaro recognized that “[t]he mobile phone is becoming more and more ubiquitous around the world” and “[m]any people carry a mobile phone or similar portable communications device, even if they do not carry a wallet around with them as they go about their daily lives.” APPLE-1034, [0032]. Integrating Tumminaro’s mobile-payment techniques would allow users to more conveniently conduct transactions at various places with their wireless devices without the

inconvenience of additionally carrying cash or a wallet that would otherwise be needed. APPLE-1003, ¶55.

Second, the combination would bring the benefits of mobile-payment transactions as expressly described in Tumminaro. APPLE-1003, ¶56. For example, Tumminaro explains that its electronic payment system “encourage[s] cash to stay in the bank (instead of consumer’s pockets),” payments through this system “are safe and traceable,” “occur in near-real-time,” “are accessible to anyone, an-time and any-place,” “optimize load or unload processing (*i.e.*, performing load or unload within bank when possible),” and the system “facilitates electronic payments in a cross carrier or cross network manner,” and “facilities electronic payments in a cross device or cross channel manner (*i.e.*, mobile, e-mail, Web, instant messenger).” APPLE-1034, [0034].

Third, the combination provides better and more expansive use of existing messaging capabilities on the Horvath-Tsampalis wireless device. Horvath and Tsampalis describe multi-modal messaging environments that allow a user to use various messaging formats (*e.g.*, IM, MMS, SMS), and Tumminaro’s techniques would further allow the wireless device to not only message with other users but also with a payment server that facilitates various forms of payment and financial transactions. APPLE-1003, ¶57.

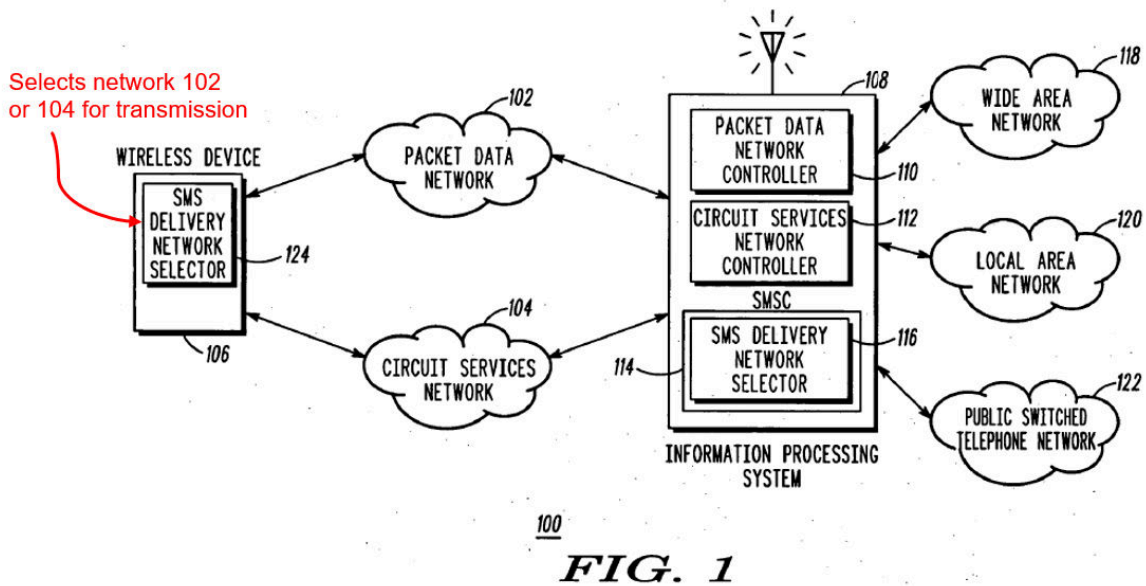
Fourth, the combination merely involves the application of a known technique to a known system to achieve predictable results. *KSR*, 550 at 417 (“simply arranges old elements”); *Intel*, 61 F.4th at 1380-81; APPLE-1003, ¶58.

2. Claim 1

Element [1pre]

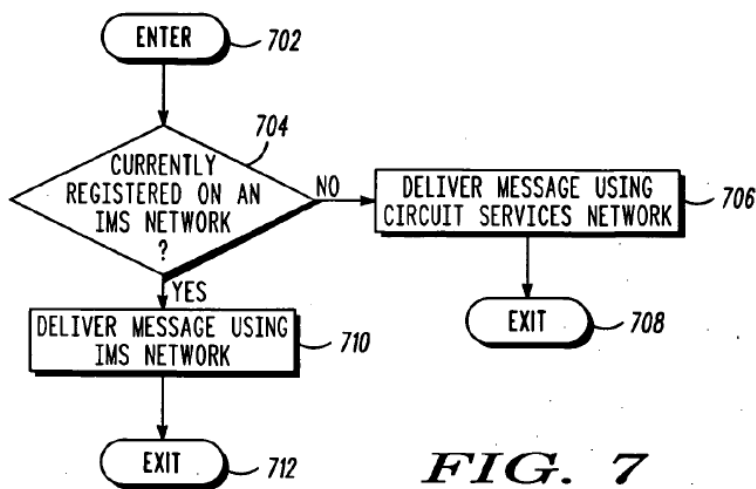
To the extent the preamble is a limitation, Horvath-Tsampalis-Tumminaro renders [1pre] obvious. APPLE-1003, ¶60. Horvath’s FIG. 1 (below) shows an example “wireless device 106” (*a mobile wireless device*³) that transmits messages on “either [a] packet data network 102 or [a] circuit services network 104.” APPLE-1004, [0014], [0060]-[0070], FIG. 1; *see also id.*, FIGS. 2, 4. “The SMS delivery network selector 124 selects a network 102, 104 for the wireless device 106 to transmit a SMS message on.” APPLE-1004, [0062]; APPLE-1003, ¶60.

³ Bold and italicized text corresponds to claim language.



APPLE-1004, FIG. 1 (annotated)

Horvath's FIG. 7 (below) further shows the sending mobile phone "select[ing] a network for transmitting a [] message based on what network the wireless device is registered with." APPLE-1004, [0078]; *see also id.*, [0009], [0050]; APPLE-1003, ¶61.



APPLE-1004, FIG. 7 (sender device perspective)

According to Horvath, wireless device 106 sends short message service (SMS) messages, “through a circuit services network” “using the traditional circuit services network method (for example, ANSI-41 procedures)” if wireless device 106 “is unregistered with” “a registrar associated with a session initiation protocol [SIP] network for communicating over a packet data network.” APPLE-1004, [0002], [0006]-[0007], [0050]. The circuit-services network 104 is included in a *cellular network* such as a “Global System for Mobile Communications (GSM)” network that provides “mobile text messaging” and “voice services” including “push-to-talk over cellular communications.” APPLE-1004, [0025]-[0026]; APPLE-1003, ¶62.

A short message service center (SMSC) 114 receives SMS messages transmitted by the sending wireless device 106 over the circuit-services network 104, and “[i]f the recipient device is not registered on the packet data network 102” (e.g., if the recipient device is not registered with the “registrar associated with a session initiation protocol [SIP] network for communicating over a packet data network”), then “the SMSC 114 delivers the SMS message to the recipient device through the traditional circuit services network method (for example, ANSI-41 procedures)” over circuit-services network 104. APPLE-1004, [0047]; *see also id.*, [0002], [0006]-[0007], [0050], [0053], [0062], FIG. 7. Horvath explains a recipient device “may not be registered on the packet data network 102 because it

was never registered to begin with, because it deregistered, or because it lost its coverage.” *Id.*, [0047]. A recipient device that “was never registered to begin with” does “***not correspond to [a] subscriber***” of the IMS or its supported services. APPLE-1003, ¶63.

On the other hand, when the sending wireless device 106 “[is] registered with the [SIP] registrar,” device 106 sends “SIP message[s]” in “SIP packets” (***packet switched messages***) “through the [SIP] network communicating over the packet data network.” APPLE-1004, [0002], [0006]-[0007], [0017], [0024], [0034], [0037] (messages are sent over the SIP network in “SIP packets”), [0038], [0039], [0041], [0050], [0078], FIG. 7. Horvath explains that “an Internet Protocol multimedia subsystem (‘IMS’) core [] supports the SIP network,” and the “IMS system [] includes application servers that host and execute services for the wireless device 106” such as SMS, MMS, and instant messaging (“IM”) services. APPLE-1004, [0033]-[0034], [0039]; *see also id.*, [0033] (“The SIP network is used for establishing instant messaging...and other real-time communications over the Internet.”), [0039] (“A service for example, is SMS, MMS, ... and the like.”). The IM and MMS messaging services facilitated by the SIP/IMS networks are each a “***service for receiving packet-switched messages***” as claimed. APPLE-1003, ¶64.

SMS is another service supported by the IMS, and Horvath's detailed description of SIP messaging for the SMS service exemplifies how a POSITA would have understood SIP messaging for the IM and MMS services to similarly operate. APPLE-1003, ¶65. For example, Horvath explains how the SMS service routes SMS messages over the SIP network from a sending device to a receiving device by having the sending device "encode[] the IS-637 content" of an SMS message "as the payload of [a] SIP MESSAGE" that is delivered over the SIP network to the recipient device, which then extracts the SMS message from the SIP MESSAGE. APPLE-1004, [0050]. Because SIP MESSAGEs are specifically for instant messaging and encapsulating any of a variety of types messages/payloads for routing through a SIP network, a POSITA would have understood or it would have been obvious for Horvath's SIP MESSAGEs to encapsulate MMS and IM messages for the MMS and IM services described in Horvath, respectively, similar to encapsulation of SMS payloads for the SMS service. APPLE-1003, ¶65 (citing APPLE-1044, 1 ("[T]HE MESSAGE method, an extension to the Session Initiation Protocol (SIP) that allows the transfer of Instant Messages. ... MESSAGE requests carry the content in the form of MIME body parts."), 3; APPLE-1045, 5, 4 and 7; APPLE-1007, 3-4).

Horvath further discloses that the recipients of SIP MESSAGEs are registered with the IMS and are subscribers to supported messaging services (e.g.,

IM, MMS) (*subscribers of the service*). APPLE-1003, ¶66. For example, Horvath describes how “application servers ... host and execute services for the wireless device 106” and how the “application server[s]” are configured for “transmitting/delivering” messages “through the packet data network 102 using the IMS network.” APPLE-1004, [0039]. Recipient devices “subscribe[]” to the services hosted by the application servers, and if a subscribed device is currently registered, then the application server (*e.g.*, SMSC 114) delivers SIP MESSAGES for corresponding services to the wireless devices 106 that are the intended recipients of the messages. *Id.*, [0035] (“HSS 210 comprises a database including profiles associated with each wireless device 106 registered with the IMS. A profile, for example, includes subscription related information.”), [0038] (“determines which application server(s) to forward the SIP message associated with the wireless device 105 so that the services subscribed to by the device 106 can be provided”), [0046] (“upon receiving notification of the device having registered at the registrar, determines that the recipient device is registered on the packet data network 102” and “delivers the SMS message to the recipient device through the packet data network 102 via the SIP network”), [0053], [0062].

Horvath discloses that the IMS core that supports the SIP network is comprised of functional components including a proxy-call-session-control function (P-CSCF) 206, an interrogating/serving-call-session-control function (I,S-

CSCF) 208, and “a registrar such as a home subscriber server (‘HSS’) 210.”

APPLE-1004, [0033]-[0034], FIG. 2; *generally id.*, [0031]-[0050]. Application servers can also optionally be included in the IMS core.⁴ APPLE-1004, [0034], [0039]. The components of the IMS core (*server*) “can reside on the same ... information processing system.”⁵ APPLE-1004, [0038]. The IMS core receives

⁴ Because application servers generally implement services independently of each other, it would have been obvious that some application servers (*e.g.*, IM and MMS application servers) could be implemented within the IMS core while other application servers (including SMSC 114) are implemented outside the IMS core. APPLE-1004 (“each respective component can reside in the same or separate information processing system”); APPLE-1003, ¶67. For Grounds 1A-1E, SMSC 114 is not part of the IMS core and does not form part of this Petition’s mapping to the “*server*” recited in [1pre]. APPLE-1004, [0034]; APPLE-1003, ¶67. The IM and MMS application servers are optionally part of the mapping to the claimed “*server*.” *Id.*

⁵ The specific attributes of the “servers” recited in claim 1 do not further define the structure of the “mobile wireless device” that is the subject of claim 1’s preamble. For example, whether a server “receives packet-switched messages transmitted via

SIP MESSAGES (*packet-switched messages*) that are to be delivered via a messaging service (*e.g.*, SMS, MMS, IM) to subscribing recipient devices. For example, “[t]he P-CSCF 206 ... is the first contact point for a wireless device 106 registered in the IMS network” and “[a]ll signaling messages are intercepted by the P-CSCF 206 allowing the P-CSCF 206 to inspect the messages.” APPLE-1004, [0036]. The S-CSCF 208 likewise “inspect[s] each message” and “determine[s] which application server(s) to forward the SIP message associated with the wireless device 106 so that the services subscribed to by the device 106 can be provided.” *Id.*, [0038]. The application servers “transmit[]/deliver[]” messages to recipient devices. APPLE-1004, [0039]; *see also id.*, [0045] (“If the SMSC 114

the service to recipient devices that correspond to subscribers of the service,” “maintains a subscriber list,” or “forwards a message ... to [a] third-party provider” are not limitations on the claimed “mobile wireless device.” Multiple elements of the Challenged Claims likewise recite limitations that do not limit the “mobile wireless device.” Indeed, at least elements [1pre], [1g], [1n], [4], [5], [6], [8], [11b], [11c], [15b], [15c], [20], and [26] suffer from this problem and are not entitled to patentable weight for purposes of validity. APPLE-1003, ¶67. Grounds 1A-1E nonetheless confirm that these features were well known and obvious to a POSITA before the Critical Date. *Id.*

determines that the recipient device is registered on the packet data network 102, the SMSC 114 delivers the SMS message to the recipient device through the packet data network 102 via IMS.”); APPLE-1003, ¶67.

Accordingly, the Horvath-Tsampalis-Tumminaro sending wireless device 106 (*mobile wireless device*) transmits at least some SIP MESSAGES (*packet-switched messages*) to at least some recipient devices that correspond to subscribers of an IM or MMS service (*service for receiving packet-switched messages*). The MMS and IM services are implemented with the IMS core (*server*) that receives SIP MESSAGES (*packet-switched messages*) transmitted via the service to recipient devices that correspond to subscribers of the service. The sending device 106 also transmits at least some messages (*e.g.*, SMS messages) over a circuit-services component 104 of a *cellular network* to at least some recipient devices that do not correspond to subscribers of the IMS or associated IM or MMS services. APPLE-1003, ¶68.

Element [1a]

Horvath discloses that the wireless device 106 (*mobile wireless device*) “is a dual mode device capable of communicating on either the packet data network 102 or the circuit services network 104.” APPLE-1004, [0061]; *see also id.*, [0060], [0062], FIG. 4. Wireless device 106 transmits and receives radio signals over a selected network by alternately coupling its antenna 404 to transmitter 410 or

receiver 408 “through a transmit/receive switch 406.” *Id.*, [0061]-[0062]. Device 106 also includes an “SMS delivery network selector 124 [that] selects a network 102, 104 for the wireless device 106 to transmit a SMS message on.” *Id.*, [0062]. “[I]f the wireless device 106 is registered on the packet data network 102, the SMS delivery network selector 124 selects the packet data network 102 for transmission of the SMS message” encoded in a SIP MESSAGE (*packet-switched message*). *Id.*, [0062], [0050], [0078], FIG. 7; APPLE-1003, ¶69.

As discussed in [1pre], *supra*, a POSITA would have found it obvious that the sending wireless device 106 transmits SIP MESSAGES carrying embedded MMS or IM messages to the IMS core (*server*) for delivery to recipient devices corresponding to subscribers of the MMS or IM services (*service*), and the IMS core receives these SIP MESSAGES *before delivery to the recipient device*.

APPLE-1004, [0050], [0077]-[0078], FIG. 7; *supra*, [1pre]; APPLE-1003, ¶70.

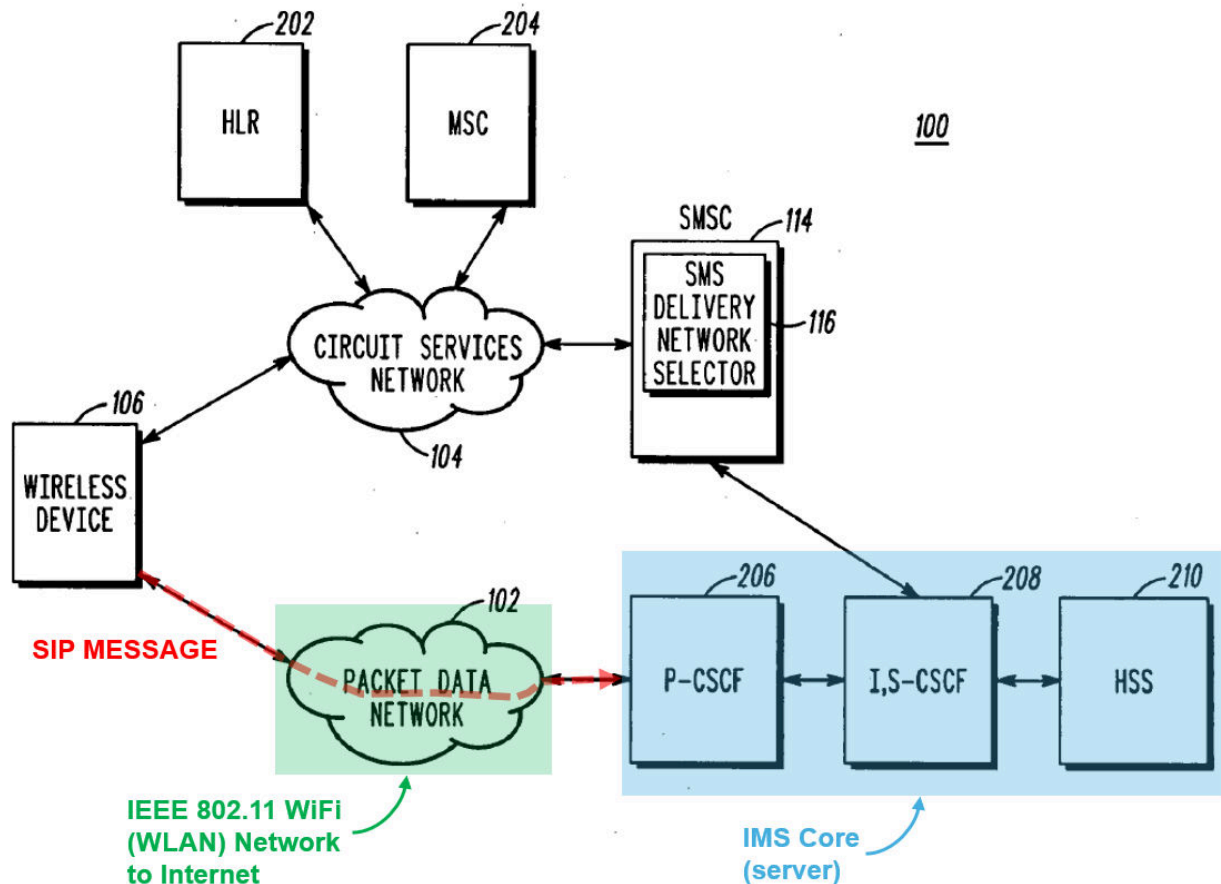


FIG. 2

APPLE-1004, FIG. 2 (annotated)

Horvath teaches that “packet data network 102 is an Internet Protocol (‘IP’) connectivity network, which provides data connections at much higher transfer rates than [sic] a traditional circuit services network,” and can comprise “an 802.11 network.” APPLE-1004, [0024]. An 802.11 network is a wireless LAN. APPLE-1003, ¶71 (citing APPLE-1011, 5:1-33, 6:27-32, FIG. 5B; APPLE-1009, 1, 3, 4; APPLE-1037). As illustrated below, a POSITA would have understood that a mobile device communicating via an 802.11 network communicates with a WLAN

access point, which is a type of base station (*WLAN base station*). APPLE-1003, ¶71 (citing APPLE-1046, FIG. 4, 13:61-14:1).

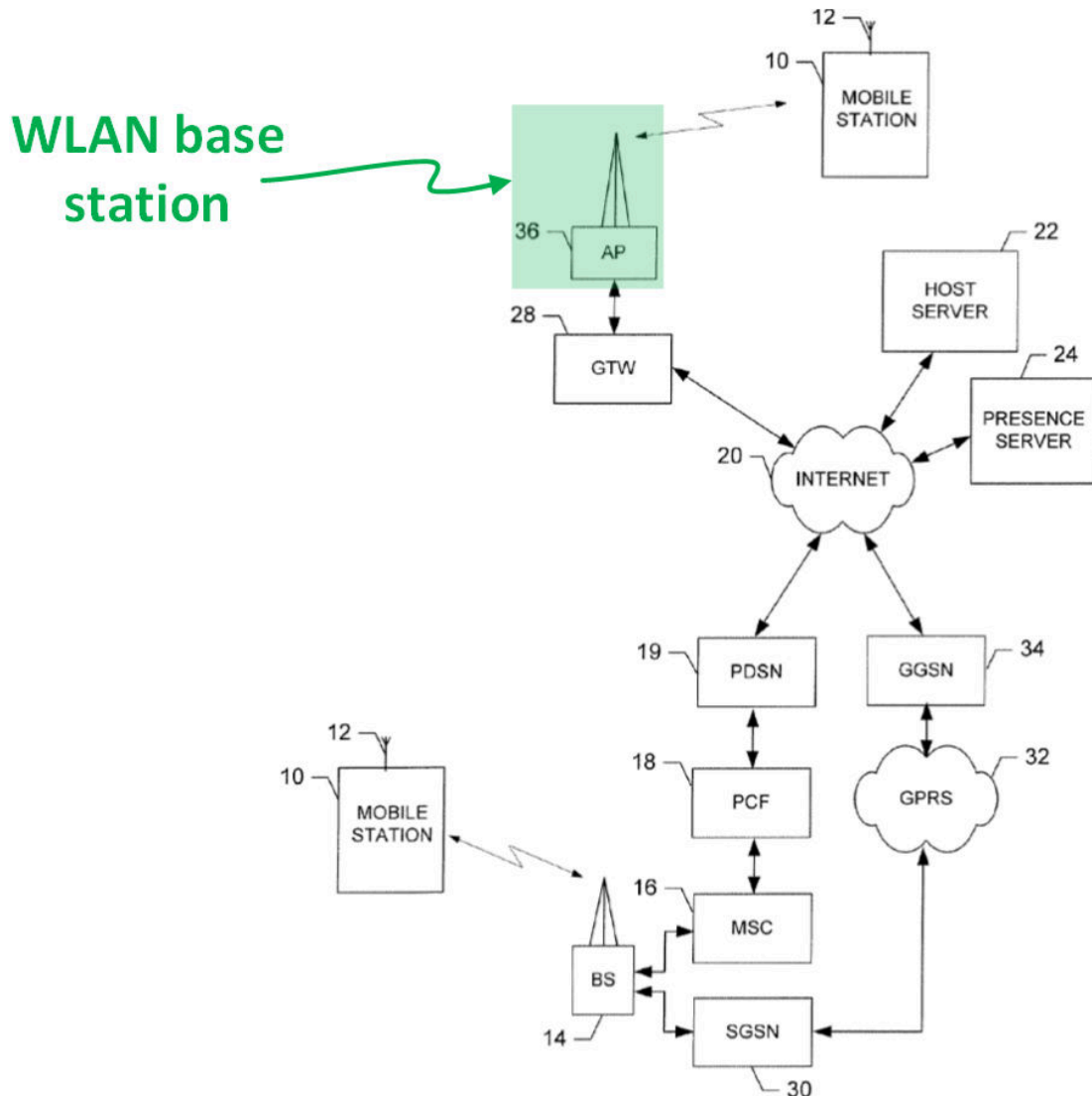


FIG. 4

APPLE-1046, FIG. 4 (annotated)

Horvath also discloses that “[t]he SIP network is used for establishing ... communications over the Internet” and that the IMS core is for an “Internet Protocol multimedia subsystem.” APPLE-1004, [0033]-[0034]. Accordingly,

Horvath-Tsampalis-Tumminaro's sending wireless device 106 (*mobile wireless device*) includes a dual-mode transmitter 410 and receiver 408 (collectively, a *WLAN transceiver*) that transmits messages from the wireless device 106 to an IEEE 802.11 WLAN access point (*WLAN base station*) and subsequently over the Internet to the IMS core (*server*) that receives SIP MESSAGES (*packet-switched messages*) transmitted via the MMS or IM services (*service*) to recipient devices that correspond to subscribers of either service, before delivery to the recipient devices. APPLE-1003, ¶72.

Element [1b]

As discussed in [1a], *supra*, Horvath discloses that the wireless device 106 (*mobile wireless device*) “is a dual mode device capable of communicating on either the packet data network 102 or the circuit services network 104.” APPLE-1004, [0061]; *see also id.*, [0060], [0062], FIG. 4. Wireless device 106 transmits and receives radio signals over a selected network by alternately coupling its antenna 404 to transmitter 410 or receiver 408 “through a transmit/receive switch 406.” *Id.*, [0061]-[0062]. Device 106 also includes an “SMS delivery network selector 124 [that] selects a network 102, 104 for the wireless device 106 to transmit a SMS message on.” *Id.*, [0062]. “If the wireless device is not registered on the packet data network 102, the SMS delivery network selector 124 selects the circuit services network 104 for transmission of the SMS message” “using the

traditional circuit services network method (for example, ANSI-41 procedures).”

Id., [0062], [0050], [0078], FIG. 7; APPLE-1003, ¶73.

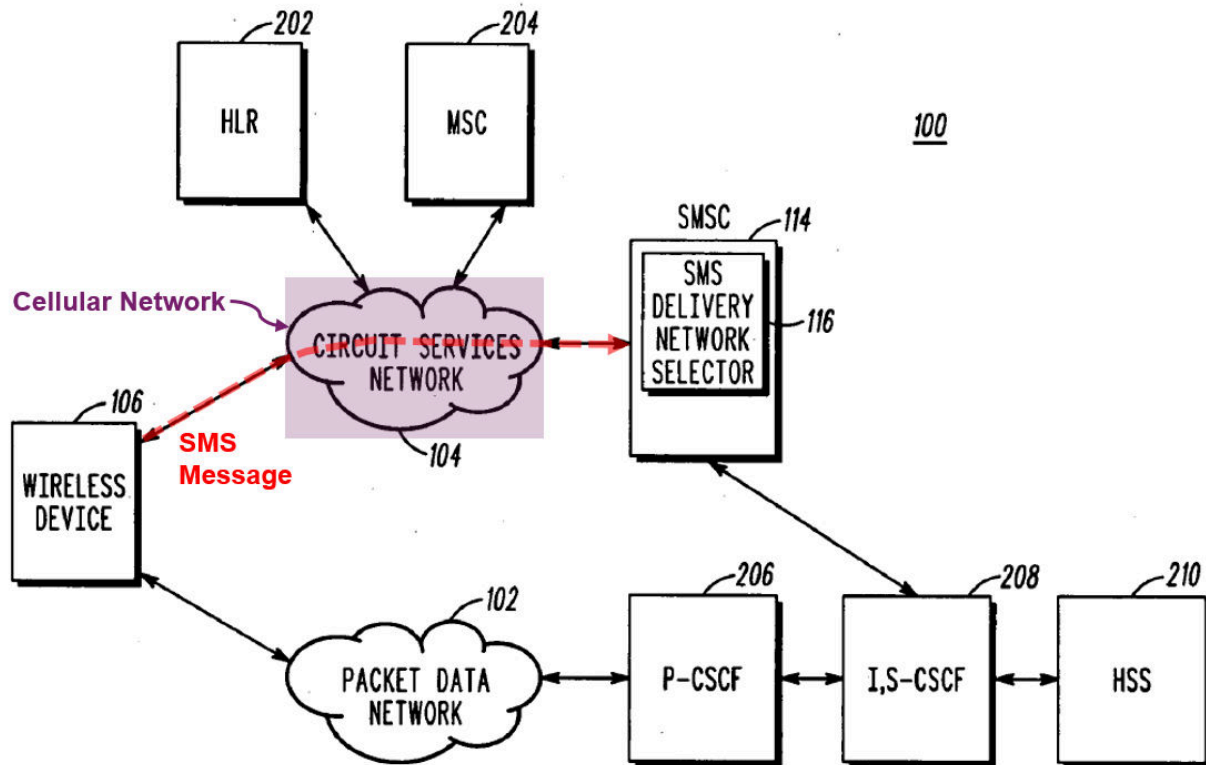


FIG. 2

APPLE-1004, FIG. 2 (annotated)

Horvath discloses that circuit-services network 104 is provided on a **cellular network** such as a “Global System for Mobile Communications (GSM)” network that provides “mobile text messaging” and “voice services” including “push-to-talk over cellular communications.” APPLE-1004, [0025]-[0026]. As illustrated below, a POSITA would have understood that a mobile device communicating

over a cellular network communicates with a base station of the cellular network.

APPLE-1003, ¶74 (citing APPLE-1046, FIG. 4, 12:54-13:60).

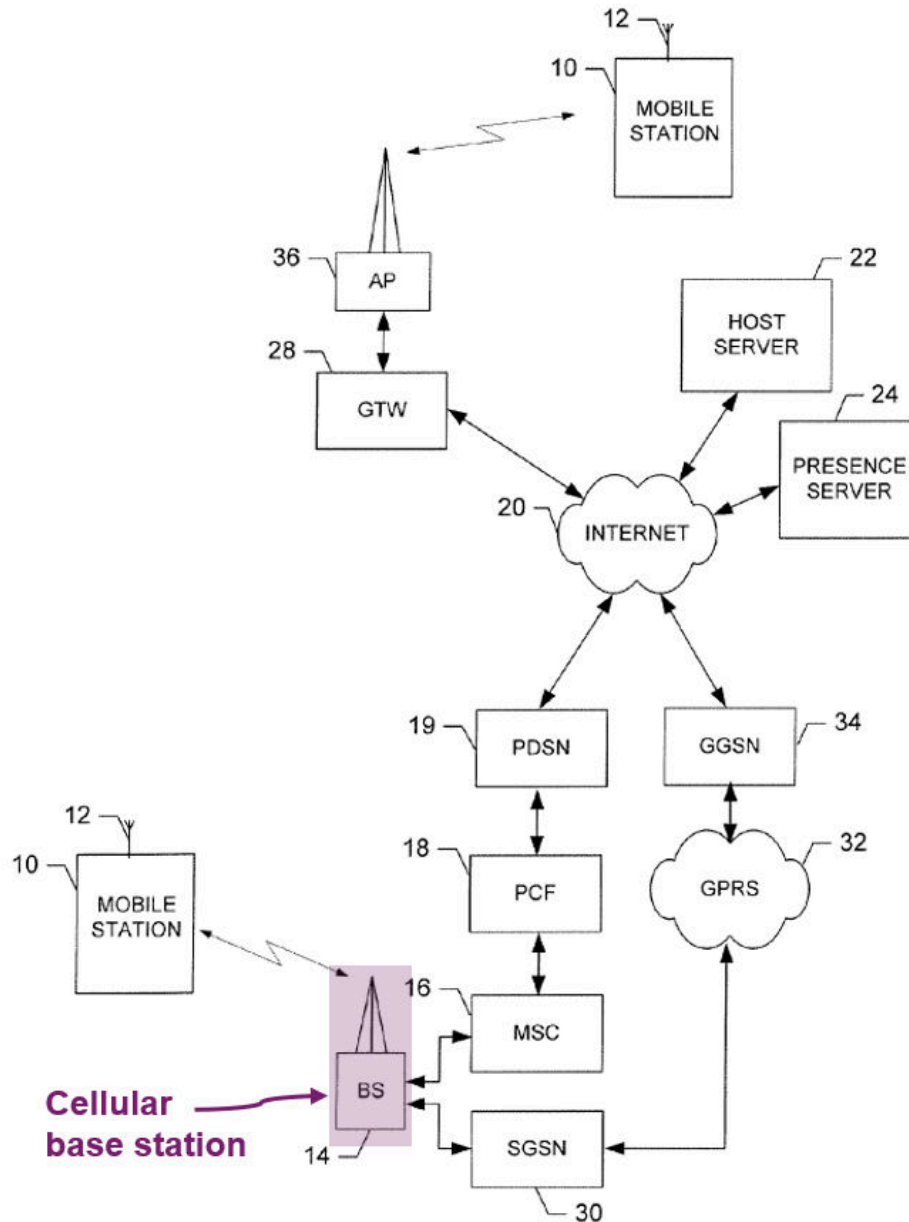


FIG. 4

APPLE-1046, FIG. 4 (annotated)

Horvath also discloses that the wireless device's transmitter 410 and receiver 408 can further communicate over a cellular network included in the packet-data network 102. In particular, "packet data network 102, in one embodiment, comprises an Evolution Data Only ('EV-DO') network, a General Packet Radio Service ('GPRS') network, a Universal Mobile Telecommunications System ('UMTS') network, ... or the like." APPLE-1004, [0024]. EV-DO, GRPS, and UMTS networks define radio communications protocols that support transmission of multimedia messages comprising at least one of images, audio clips, or videos. APPLE-1003, ¶75 (citing APPLE-1048, 1, 2-24; APPLE-1047); *cf.* APPLE-1001, 10:10-18 & FIG. 6C ('827 Patent identifying "GPRS, 3G, 3.5G" as "wireless protocols ... used in the data link layer to deliver the message"). For the reasons discussed above, a mobile device communicating via GPRS, EV-DO, or UMTS would also communicate with a base station of a cellular network since GPRS, EV-DO, and UMTS operate over cellular networks. APPLE-1003, ¶75 (citing APPLE-1046, FIG. 4, 12:54-13:60).

Accordingly, Horvath-Tsampalis-Tumminaro's sending wireless device 106 (*mobile wireless device*) includes a dual-mode transmitter 410 and receiver 408 (collectively, a *cellular transceiver*) that transmits messages from the wireless device 106 to a cellular base station before delivery to a recipient device, where the cellular transceiver and the cellular base station communicate using EV-DO,

GPRS, or UMTS protocols (*a radio communications protocol that supports transmission of multimedia messages comprising at least one of images, audio clips, or videos*). APPLE-1003, ¶76.

Element [1c]

As discussed in [1a], *supra*, the combination's sending wireless device 106 (*mobile wireless device*) includes a dual-mode receiver 408 and transmitter 410, the latter of which transmits messages to an 802.11 WiFi access point (*WLAN base station*) and subsequently over the Internet to the IMS core (*server*) that receives SIP messages (*packet-switched messages*) transmitted via an MMS or IM service to recipient devices that correspond to subscribers of the service. APPLE-1004, [0024], [0060]-[0062], FIGs. 1-2, 4; *supra*, [1a]. Horvath further discloses that "[t]he wireless device 106 can connect to the IMS network using different methods, which all use standard IP." APPLE-1004, [0034]. "[W]hen a wireless device 106 wants to access the packet data network 102, the wireless device 106 registers with the IMS network." *Id.* "The P-CSCF 206 is a SIP proxy and is the first contact point for a wireless device 106 registered in the IMS network." *Id.*, [0036]. Accordingly, it would have been obvious that Horvath-Tsampalis-Tumminaro's sending wireless device 106 connects via the 802.11 WiFi access

point (*WLAN base station*) to the IMS core (*server*). APPLE-1003, ¶77 (citing APPLE-1049, 24).

Element [1d]

As discussed in [1b], *supra*, the combination's sending wireless device 106 (*mobile wireless device*) includes a dual-mode receiver 408 and transmitter 410, the latter of which transmits messages to a cellular base station via packet-based cellular protocols such as UMTS, GPRS, or EV-DO. APPLE-1004, [0024], [0060]-[0062], FIGs. 1-2, 4; *supra*, [1b]. Horvath further discloses that "[t]he wireless device 106 can connect to the IMS network using different methods, which all use standard IP." APPLE-1004, [0034]. "[W]hen a wireless device 106 wants to access the packet data network 102, the wireless device 106 registers with the IMS network." *Id.* "The P-CSCF 206 is a SIP proxy and is the first contact point for a wireless device 106 registered in the IMS network." *Id.*, [0036]. Accordingly, it would have been obvious that Horvath-Tsampalis-Tumminaro's sending wireless device 106 connects via the cellular base station to the IMS core (*server*) via GPRS, UMTS, or EV-DO. APPLE-1003, ¶78 (citing APPLE-1049, 24).

Element [1e]

For context, a POSITA would have known that "various bearers in the mobile network technology" include, for example, "SMS, USSD (Unstructured

Supplementary Services Data), CSD (Circuit Switched Data) and packet-switched bearers, such as *e.g.*, GPRS (General Packet Radio Service) etc.” APPLE-1051, [0014]; *see also* APPLE-1050, 4:42-46. The ’827 Patent describes that a “conventional SMS bearer” may be used on a circuit-switched network (*e.g.*, GSM), whereas a “packet-switched bearer may be a HSDPA, WCDMA, CDMA2000, GPRS or similar data bearer,” and “[t]he packet-switched bearer may also [be] supported by other wireless technologies such as Bluetooth, WiFi, WiMax.” APPLE-1001, 2:51-60. In general, messages sent over a circuit-switched network are sent via a circuit-switched bearer and messages sent over a packet-switched network are sent via a packet-switched bearer. Thus, when an SMS message is sent over a circuit-switched network⁶, it is utilizing an SMS bearer, which is a type of circuit-switched bearer. *See* APPLE-1001, 2:51-60,

⁶ Some packet-switched networks support SMS messages, and in those cases, an SMS bearer would also be a packet-switched bearer. *See, e.g.*, APPLE-1054, [0091]. However, in other cases, SMS sent over a packet-switched network is encapsulated in a packet-switched bearer. *See, e.g.*, APPLE-1004, [0050] (describing encoding SMS content as the payload of an SIP message); APPLE-1054, [0166] (describing encapsulating SMS data “in IP format before delivery to the WLAN”); APPLE-1003, ¶79.

APPLE-1050, 4:42-46. On the other hand, for messages sent over the packet-switched network, such as the SIP MESSAGEs taught by Horvath, the bearer (*e.g.*, 802.11 WiFi, GPRS, UMTS, or EV-DO) is a packet-switched bearer. *See* APPLE-1004, [0024] (identifying GPRS as an example of its packet-switched network 102), [0040]-[0041], [0050] (describing the delivery of a SIP MESSAGE over a packet-switched network); APPLE-1003, ¶79.

In this context, it would have been obvious that Horvath-Tsampalis-Tumminaro's sending wireless device 106 (*mobile wireless device*) transmits SIP MESSAGEs (*packet-switched messages*) using an 802.11 WiFi bearer (*a packet-switched bearer supported by the WLAN base station*) when connected to the 802.11 network, and transmits packet-switched messages using GPRS, EV-DO, or UMTS bearers (*a packet-switched bearer supported by the cellular base station*) when connected to a cellular data network. APPLE-1004, [0024]-[0027], FIGs. 1-2; *supra*, [1a]-[1b]. Indeed, Horvath contemplates that the wireless device 106 is capable of communicating on a range of networks using respective bearers corresponding to the different networks and services provided. *See* APPLE-1004, [0061] ("dual-mode device capable of communicating on either the packet data network 102 or the circuit services network 104"), [0064] ("wireless device 106[] ... also includes an optional local wireless link 416 that allows the wireless device 106 to directly communicate with another wireless device"), [0022] ("wireless

device is intended to broadly cover many different types of devices that ... operate in a wireless communication system”), [0027] (“support any number of wireless devices 106” and also “allow for mesh networking”). Horvath also describes how a communication system can include multiple types of packet-switched networks including 802.11 WiFi, EV-DO, GPRS, UMTS, wide area networks 118, and local area networks 120. APPLE-1004, [0024]-[0028], FIG. 2. In this context, it would have been obvious for the sending wireless device 106 to transmit messages via packet-switched bearers on multiple types of networks including 802.11 WiFi and cellular data networks. This is reinforced by Tumminaro, which likewise discloses wireless devices configured to communicate messages over both WiFi and cellular data networks. *See, e.g.*, APPLE-1034, [0161] (“Various communication protocols may be used to facilitate communication”), [0162] (“a wireless network using a protocol such as Wi-Fi”), [0534] (“mobile networks based on all three cellular technologies, with GSM, CDMA, and TDMA”), [1161] (“cellular telephones”), [0256]-[0257], [045], [0456], [0534], [1160]-[1163]. Not only is the option of transmitting messages via both WiFi and cellular data networks expressly disclosed in Horvath and Tumminaro, but a POSITA would have known that mobile devices were commonly implemented to connect to both WiFi and cellular data networks before the Critical Date and this was obvious to provide the device with greater access to services on different networks in more areas than would

otherwise be possible if the device were limited to use of a single packet-switched bearer. *Infra*, [1j]-[1k]; APPLE-1003, ¶80 (citing APPLE-1055, [0028]-[0030], FIG. 2; APPLE-1056, [0002]-[0009]; APPLE-1068, Abstract (“portable devices to communicate ... via both cellular and WiFi”), [0006], [0032]-[0034]).

Element [1f]

Horvath explains that the sending wireless device 106 (***mobile wireless device***) sends messages to recipient wireless devices over one or more packet-data networks 102 and/or circuit-services networks 104. APPLE-1004, [0050], [0078], FIGs. 1-2, 7. Horvath discloses “information to identify” each wireless device registered to the SIP network and the IMS core, *e.g.*, a “destination address” (also referred to as “contact address” or “IMS contact address”), “such as a telephone uniform resource identifier (‘tel-URI’),” *e.g.*, “the telephone number assigned to the wireless device 106.” APPLE-1004, [0035] (“A tel-URI, for example is the telephone number assigned to the wireless device 106.”), [0045], [0050], [0073] (“the contact address (for example, tel-URI) of the wireless device 106”), [0076]; APPLE-1003, ¶81.

Horvath’s functionality for receiving information associated with a destination address of a recipient is maintained in the combination with Tsampalis, which similarly describes conventional addressing techniques where the sending

device receives phone numbers of intended messaging recipients while actively composing a message. APPLE-1005, [0033]-[0034], [0061]. Tsampalis teaches that an “active message” being composed by a user of the sending mobile phone contains a “recipient ID” received from the user, *e.g.*, a phone number in the form of a MSISDN. *See* APPLE-1005, FIG. 4 (below, showing “recipient ID” 402 list in the form of telephone numbers), [0032]-[0033], [0046], [0061], [0064], FIGS. 3-4, 7, 10; APPLE-1052, 12:53-60; APPLE-1003, ¶82 (citing APPLE-1053, [0037]-[0038], [0066], [0072]).

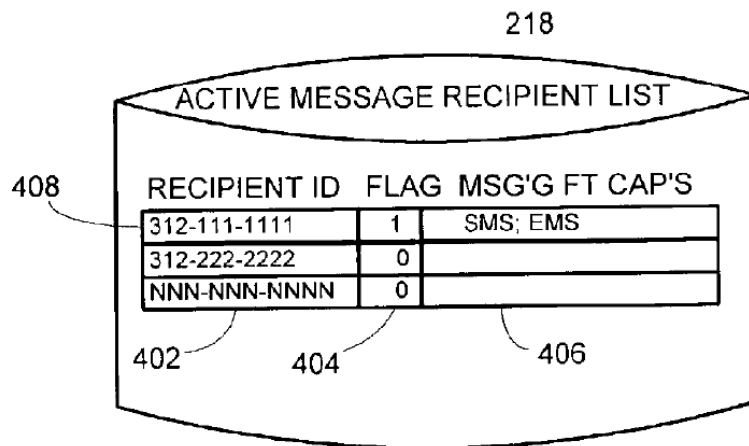


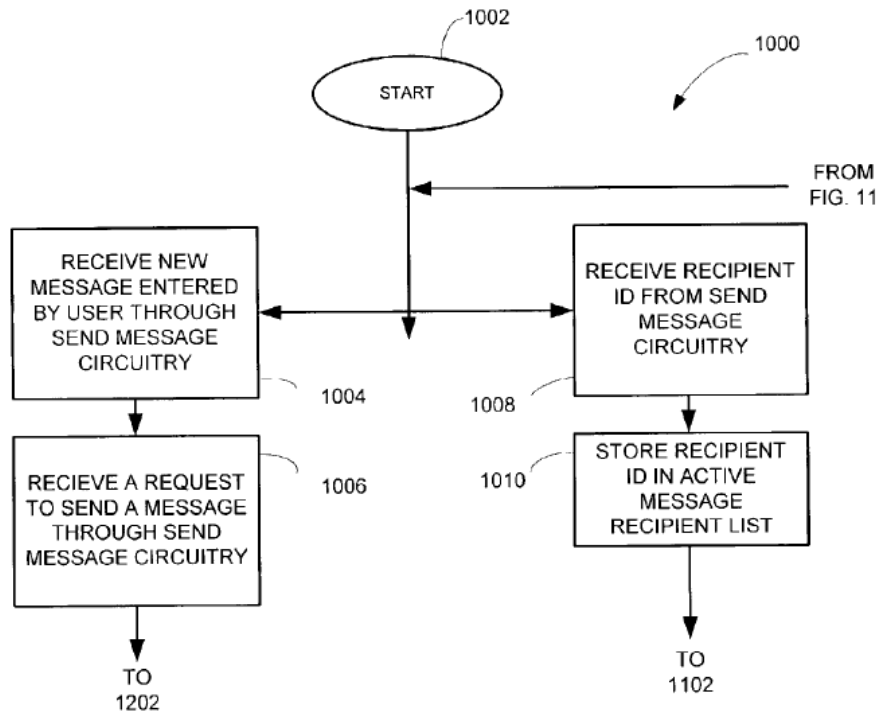
FIG. 4

APPLE-1005, FIG. 4

Referring to FIG. 10 (below), Tsampalis explains, “[a]s shown in Block 1004, the method includes [] receiving a new unformatted message 110 entered by

a user” and “[b]lock 1008 demonstrates the method including the receiving of a next recipient ID 402 as the recipient ID is entered in the send message circuitry 106.” APPLE-1005, [0046], FIG. 10; APPLE-1003, ¶83. Tsampalis describes that as a user enters message text and an active message recipient list into the sending mobile phone’s user interface, “the mobile wireless communication device messaging format capabilities determinator circuitry 104...retrieve[s] the [receiving] mobile wireless communication device [MFCI] 110 associated with the” recipient ID of a receiving mobile phone entered into the active message recipient list. APPLE-1005, [0033]; *see also id.*, [0046]; *infra*, [1g]-[1h].

FIG. 10



APPLE-1005, FIG. 10

It also would have been obvious that the combination's sending wireless device 106 (*mobile wireless device*) includes a “*message client*” that performs the “*retriev[ing]*” operation recited in [1f]. For example, Horvath describes the wireless device 106 executing software to carry out messaging functions substantially similar to those performed by the software client described in the '827 Patent. APPLE-1004, [0061]-[0062], FIG. 4 (depicting memory 412 and processor 402); *cf.* APPLE-1001, 5:2-3 (“the invention is a software program to

implement the method”), 5:49 (“a message client 114 runs on the mobile device”). Moreover, implementing a message client on the Horvath-Tsampalis-Tumminaro device would have been obvious to ensure the sender was provisioned with software adequate to carry out the messaging functions of the combination as described herein. These functions align with the types of functions that were commonly performed by messaging clients before the Critical Date. APPLE-1003, ¶84 (citing APPLE-1008, [0002], [0004], [0038]; APPLE-1009, pp. 3, 6; APPLE-1017, 34:63-66; APPLE-1021, 4:66-5:6, 9:57-64); *see also* APPLE-1005, [0024] (Tsampalis describing its circuitries on a sender wireless device for determining recipient messaging capabilities and for sending messages as “software modules”), [0027], [0046], FIGS. 3-4, 7, 10.

For each of these reasons, Horvath-Tsampalis-Tumminaro renders obvious a sending mobile phone (*e.g.*, wireless device 106) including a message client that ***retrieves, from a message, information corresponding to at least one mobile phone number of a wireless device of an addressed recipient*** (*e.g.*, the send message circuitry 106 retrieving a “destination address” or “recipient ID” from an active message being composed by the user of the sending mobile phone, and the messaging format capabilities determinator circuitry 104 retrieving the MFCI 110 corresponding to the “destination address” or “recipient ID” of the message, where

the “destination address” or “recipient ID” is a telephone number in the form of a tel-URI or MSISDN). APPLE-1003, ¶85.

Element [1g]

As discussed for [1f], *supra*, the combination’s sending mobile device 106 includes a message client that “retrieve[s] the [receiving] mobile wireless communication device messaging format capabilities information 110 associated with the” recipient ID of an addressed receiving wireless device entered into the active message recipient list. APPLE-1005, [0033]; *see also id.*, [0046]; *supra*, [1f]. As discussed in §IV.A.1(b), *supra*, Tsampalis describes that the recipient ID may be the phone’s MSISDN, which was known to be “the standard international telephone number used to identify a given subscriber.” *See* APPLE-1005, FIGS. 3, 4 (illustrating that the recipient ID may be a telephone number); APPLE-1052, 12:53-60; APPLE-1003, ¶86. If the format-capabilities information is not available in the sending mobile phone’s local phonebook or the phonebook’s information has not been updated within a certain period of time, “the remote message format capabilities determinator circuitry 208 [of the sending mobile phone] is then invoked and generates a second mobile wireless communication device messaging format capabilities information request 226.” APPLE-1005, [0033]-[0034], FIGs. 6, 13.

The requested messaging format capabilities information 110 for the receiving mobile phone may be “stored in a location other than within the second mobile wireless communication device 200, for example, such as a network element within the network 108” (*e.g.*, a “web server”), and the sending mobile phone directs the request to the network element. APPLE-1005, [0039], [0056]-[0057]. In at least one obvious implementation, the “web server” described by Tsampalis would be included in or combined with one or both of Horvath’s HLR 202 or HSS 210 (the latter of which is part of the “IMS core”), because Horvath’s HLR and HSS are “network elements within the networks” and store similar information as Tsampalis’s web server. *See* APPLE-1004, [0035], [0044], FIG. 2; APPLE-1003, ¶87. Specifically, Horvath’s HLR “comprises a database including information associated with a wireless device subscribing to the circuit services network 104,” which includes “service(s) subscribed to by the wireless device 106.” APPLE-1004, [0031]. Similarly, Horvath’s HSS “comprises a database including profiles associated with each wireless device 106 registered with the IMS,” and these profiles “include[] subscription related information,” as well as capability information indicating whether each wireless phone is configured to receive messages through the packet-data network. APPLE-1004, [0035], [0044]. Indeed, Tsampalis teaches that, “while inputting the active message 216, the first mobile wireless communication device 100 will transparently contact the network

talking to the address(es), (e.g., the MSISDN(s)), of the recipients(s), and try to talk with their home location register (HLR) to find out if they are capable of receiving” certain types of messages. APPLE-1005, [0061].

As noted above, Horvath and Tsampalis teach that the HLR and HSS “include[] information to identify each registered wireless device 106 such as...the telephone number assigned to the wireless device.” See APPLE-1004, [0031], [0035], [0047]; APPLE-1005, [0061]. Thus, to obtain the format-capabilities information, it would have been obvious for the combination’s sending device 106 to transmit a request that included the telephone number or other form of “destination address” or “recipient ID” (*information corresponding to the mobile phone number of the wireless device of the addressed recipient*) of the receiving device to the “network element within the network” (e.g., HLR 202 and/or HSS 210), so that the network element would be able to look up the profile of the receiving device, including the receiving device’s capabilities and relates subscription information. See APPLE-1004, [0035], [0044]; APPLE-1005, [0033], [0039], [0046], [0056]-[0057], [0061]; see also APPLE-1053, [0068] (“a telephone number may be used to correlate and thread together different types of messages such as telephone messages, voicemail messages, fax messages, SMS messages, and MMS messages”); APPLE-1003, ¶88.

As discussed in [1a] and [1c], *supra*, the sending wireless device 106 includes a WLAN transceiver that allows the sending device 106 to connect and communicate with the IMS core (including HSS 210) via an 802.11 access point (***WLAN base station***) and over the Internet. APPLE-1004, [0024]-[0025], [0060]-[0062], FIGs. 1-2, 4; *supra*, [1a], [1c]. In this context, it would have been obvious for the sending wireless device's request to be transmitted via the 802.11 access point and over the Internet to the HLR 202 and/or HSS 210, particularly when the wireless device 106 is connected to the 802.11 network. APPLE-1004, [0024]-[0025], FIG. 2; APPLE-1004, [0004], [0009] (describing desire to unburden the circuit-services network and communicate over packet-data networks (*e.g.*, 802.11 WLAN) where possible); APPLE-1003, ¶89.

It also would have been obvious that the combination system's HLR 202 and/or HSS 210 would provide a "***server that maintains a subscriber list***" and that the request sent from the sending wireless device 106 (***mobile wireless device***) would constitute a request to "***determine whether the wireless device of the addressed recipient corresponds to a subscriber***" of an MMS or IM service (***service***). For examples, as discussed above, HLR 202 and HSS 210 store information regarding the "service(s) subscribed to by the wireless device 106." APPLE-1004, [0031], [0035], [0044]; APPLE-1005, [0061]. Horvath and Tsampalis describe that two such services to which a wireless device may be

subscribed are MMS and IM services. *See* APPLE-1004, [0002], [0025], [0033] (“instant messaging”), [0039] (“A service for example, is SMS, MMS, caller ID, call waiting, push-to-talk, voicemail, and the like”); APPLE-1005, [0002]-[0003], [0058]-[0063]; *supra*, [1pre]. The HLR 202, HSS 210, or both, thus maintain a ***subscriber list*** indicating which services each device is subscribed to. APPLE-1003, ¶90.

A POSITA would have found obvious that the sending wireless device’s request to the HLR 202 and/or HSS 210 in the Horvath-Tsampalis-Tumminaro combination would seek not just the recipient’s capabilities information for the example services discussed in Tsampalis (*e.g.*, SMS, EMS, and MMS) but rather would seek information about *all* the services to which the recipient is subscribed (*e.g.*, SMS, EMS, MMS, and IM). Tsampalis describes how its author sought to overcome the problem of “[b]eing unable to process the message due to the incompatibility of its messaging service capabilities with that of the format of the received message.” APPLE-1005, [0003]. In other words, Tsampalis recognizes that format capabilities information is related to the messaging services to which a mobile phone is subscribed, and therefore suggests that the format capabilities information itself indicates subscriber information. Moreover, requests for such subscription and registration information along with format-capabilities information was well known long before the alleged invention of the ’827 Patent.

APPLE-1003, ¶91 (citing APPLE-1046, 1:24-50, 5:29-33, 7:28-8:45, 12:25-36; APPLE-1050, [0103], [0107], [0115], [0122], [0127]; APPLE-1064, 2 (“SIP location services already contain presence information, in the form of registrations”); APPLE-1063, 1 and 7-8; APPLE-1043 and APPLE-1007). Thus, a POSITA would have found obvious, for reasons similar to those expressly discussed in Tsampalis, that providing a sending mobile phone with more detailed information about the recipient, including their subscriber information, will help the sender determine how and where to send a message and what content should be included. *See supra* §IV.A.1(d)(i) (providing similar motivations for the Tsampalis combination).

Accordingly, it would have been obvious that Horvath-Tsampalis-Tumminaro’s sending wireless device 106 transmits a *request*, including a telephone number, recipient ID, or destination address (*information corresponding to the mobile phone number of the wireless device of the addressed recipient*), via the 802.11 access point (*WLAN base station*) and the Internet, to *a server that maintains a subscriber list* (e.g., the network element within the network 108, such as HLR 202 and/or HSS 210, that contains the format capabilities and subscription-related information), *to determine whether the wireless device of the addressed recipient corresponds to a subscriber of the service* (e.g., MMS or IM service). APPLE-1003, ¶92.

Element [1h]

As explained for [1g], *supra*, it would have been obvious for the combination's sending wireless device 106 to transmit a request via a WLAN base station and the Internet to a server that maintains a subscriber list (*e.g.*, the network element within the network 108, such as HLR 202 and/or HSS 210, that contains the format capabilities and subscription-related information), to determine whether the wireless device of the addressed recipient corresponds to a subscriber of the service (*e.g.*, MMS or IM service). *Supra*, [1g]; APPLE-1003, ¶93.

Tsampalis goes on to teach that “the method includes receiving a response to the request where the response contains the second mobile wireless communication device messaging format capabilities information 110, as shown in step 604.”

APPLE-1005, [0042]; *see also id.*, [0057] (“In response, the remote relay/server 1304 then sends a new capabilities signal two 1322 (including a second mobile wireless communication device messaging format capabilities information 110) to the local relay/server 1302,” which sends this to the sending mobile phone).

Because the combination's HLR 202 and/or HSS 210 store the messaging capabilities information and receive the request for such information from the sending mobile phone (*see supra*, [1g]), a POSITA would have understood and found obvious that the response described by Tsampalis would have been sent from the HLR 202 and/or HSS 210 to the sending wireless device 106. The

response would include information about all the services to which the recipient is subscribed (*e.g.*, SMS, EMS, MMS, and IM). *Id.*; *supra*, [1g]. The response would also predictably be returned over the same connection as the request was sent such that the response would be received by the sending wireless device via the 802.11 access point (***WLAN base station***) and the Internet. APPLE-1005, FIG. 13 (showing requests and responses communicated over the same signaling lines); APPLE-1003, ¶94; *supra*, [1g] (explaining how it would be obvious also to transmit the request via the WLAN base station and the Internet). A POSITA also would have understood that the HLR 202 and/or HSS 210 would provide a response to every request for capabilities and related subscription information, regardless of which capabilities or services are indicated as being subscribed to in the profile associated with the addressed recipient. APPLE-1003, ¶95 (citing APPLE-1046, 2:2-17; APPLE-1053, [0078]); APPLE-1005, [0035], [0042], [0051] (“limited messaging capabilities” not including MMS), [0060] (“MMS=‘yes’; EMS=‘no’; and SMS=‘yes’”), [0057]-[0059], FIGs. 3-4.

Thus, in the Horvath-Tsampalis-Tumminaro combination, it would have been obvious that the sending wireless device 106 would receive a ***response*** from the ***server that maintains a subscriber list*** (*e.g.*, the network element within the network 108, such as HLR 202 and/or HSS 210), via the 802.11 access point (***WLAN base station***) and the Internet, containing information ***indicating whether***

the wireless device of the addressed recipient corresponds to a subscriber of the service (e.g., MMS or IM service), where a *negative response indicates that the wireless device of the addressed recipient is not a subscriber of the service* (e.g., a response indicating that the device has “limited capabilities” or a response that otherwise fails to indicate that the device is subscribed to the MMS or IM services). APPLE-1003, ¶96.

Element [1i]

Tsampalis discloses that a sending wireless device can set a “default format” for outgoing messages, and the sending device will format a message for transmission according to the “default format” if the recipient is a subscriber to the messaging service associated with the default format. APPLE-1005, [0062] (“[A] message may be initially formatted in the default messaging capabilities of the sending device, (e.g., MMS format), and if necessary, may be reformatted in a new format, (e.g., SMS), before being sent.”), [0036]-[0037], [0048]-[0054], [0062], [0064], FIG. 11. Tsampalis explains that rich formats that support multimedia attachments and longer body text are often preferable over formats having more limited capabilities such as SMS, and a rich format can be set as the default format or otherwise preferred over limited capability formats (e.g., SMS). *Id.*, [0062]-[0064]; APPLE-1003, ¶97.

As discussed in [1pre], *supra*, the sending wireless device 106 in the

Horvath-Tsampalis-Tumminaro combination may send messages in different formats including SMS, MMS, and IM via corresponding SMS, MMS, and IM services. *Supra*, [1pre]; *see also supra*, [1g]-[1h]. MMS and IM are both rich formats that support multimedia attachments and longer message lengths than SMS. Based on Tsampalis's teaching that rich messaging formats are often preferable over SMS when the recipient is capable of receiving a richly formatted message, a POSITA would have found it obvious to set either MMS or IM as the default messaging format to leverage the enhanced capabilities of those formats over SMS since both are rich messaging formats. The Horvath-Tsampalis-Tumminaro sending device would thus format messages as MMS or IM messages for transmission via a SIP-supported MMS or IM service by default under certain conditions including that the sending device is registered with the IMS core and the recipient's capabilities information indicates that the recipient is a subscriber of the MMS or IM services and capable of receiving MMS or IM messages, respectively. *Id.*; APPLE-1004, [0050], [0078], FIG. 7; APPLE-1003, ¶98.

Also as discussed in [1pre], *supra*, MMS and IM are both packet-switched messaging services, and when MMS or IM are utilized in a SIP network like Horvath's, it would have been understood and obvious that the sending device 106 encapsulates MMS and IM messages in SIP MESSAGEs that the sending device sends to the IMS core, and which are then routed to corresponding MMS or IM

application servers for further processing and delivery to addressed recipient devices. APPLE-1004, [0033], [0039], [0050], [0076]; *supra*, [1pre]. Because the SIP network operates on a packet-data network 102 and SIP MESSAGES are sent in “SIP packets” (*packet-switched messages*), a POSITA also would have found obvious that the sending wireless device selects a *packet-switched bearer* (e.g., an 802.11 WiFi bearer when the sending device is connected to the 802.11 network or a cellular-based GPRS, EV-DO, or UMTS data bearer when the sending device is only connected to a cellular network) for transmission of a SIP MESSAGE containing either an MMS or IM-formatted message to the addressed recipient via the IMS core (*server*). APPLE-1004, [0024], [0031], [0037], [0050] and [0078] (selecting packet data network transmission when registered), FIGs. 2, 7; *supra*, [1pre], [1e]; APPLE-1003, ¶99.

The Horvath-Tsampalis-Tumminaro sending device’s selection of a *packet-switched bearer* would also be *based at least in part on the response indicating that the addressed recipient corresponds to a subscriber of the [MMS or IM] service* since transmission of MMS and IM messages (e.g., encapsulated in SIP MESSAGES) require a packet-switched bearer, and as suggested by Tsampalis, the sending device applies the default rich-messaging format (e.g., MMS or IM) if the response indicates that the recipient is a subscriber capable of receiving messages via the corresponding rich-messaging service (e.g., MMS or IM service). *Supra*,

[1e]. For example, Tsampalis teaches that the device can provide the user with an option to “abort” and therefore “prevent[] the sending of [a] message to any recipient with limited capabilities in any format,” meaning that, in this case, the sending device’s determination to select a packet-switched bearer for transmission is based on the addressed recipient’s capabilities information indicating that the recipient corresponds to a subscriber of a rich-messaging service (*e.g.*, IM or MMS service) because the transmission could otherwise be aborted (the packet-switched bearer would not be selected for transmission) if the recipient has “limited messaging capabilities” and thus does not correspond to a subscriber of a rich-messaging service (*e.g.*, IM or MMS service). APPLE-1005, [0053], [0062], FIG. 12. More generally, the Horvath-Tsampalis-Tumminaro sending device implements Tsampalis’s teachings to format and transmit a message in a rich format (*e.g.*, MMS, IM) using a packet-switched bearer by default whenever the sending and receiving devices are both capable of communicating richly formatted messages, and thus the selection of a packet-switched bearer for transmission of such messages is based at least in part on the response indicating that the addressed recipient is a subscriber of a service for receiving richly formatted messages (*e.g.*, MMS, IM). APPLE-1005, [0053], [0062]-[0063]; *see also* APPLE-1004, [0050], [0076]-[0078], FIG. 7; APPLE-1003, ¶100.

A POSITA also would have found it obvious in some implementations to

“abort” or defer transmission of a message containing multimedia attachments (or that otherwise exceed the capabilities of SMS) if either the sending or recipient device is incapable of transmitting or receiving MMS or IM messages because the message would either fail to be delivered if the default MMS or IM format were maintained or the multimedia attachments would be lost if the message were converted to SMS. APPLE-1005, [0062], [0050]-[0055], FIG. 12; APPLE-1004, [0050], [0078], FIG. 7. The selection of a packet-switched bearer for transmission of MMS or IM messages using SIP (rather than formatting the message as an SMS and sending via a circuit-switched SMS bearer) was also obvious to further Horvath’s goal of unburdening the circuit-switched network 104 of message traffic and instead utilizing the packet-data network 102 for such messaging when available. APPLE-1004, [0004], [0009]; APPLE-1003, 101.

Elements [1j]-[1k]

As discussed in [1e], *supra*, it would have been obvious for the combination’s sending wireless device 106 (***mobile wireless device***) to be configured with the capability of transmitting SIP MESSAGES (***packet-switched messages***) on both an 802.11 WiFi data bearer (***a packet-switched bearer supported by a WLAN base station***) and a GPRS, EV-DO, or UMTS data bearer (***a packet-switched bearer supported by a cellular base station***). APPLE-1004, [0024]-[0027], [0060]-[0062], FIGs. 1-2m 4; APPLE-1034, [0161]-[0162], [0534],

[1161], [0256]-[0257], [045], [0456], [0534], [1160]-[1163]; *supra*, [1e].

Although the sending device has capabilities for transmitting on multiple packet-switched bearers, Horvath contemplates the selection of a single packet-switched bearer for transmission of a given message (*e.g.*, a SIP MESSAGE). *See* APPLE-1004, [0061] (“communicating on either” network), [0050] and [0078] (describing transmission of message on packet data network 102 when sender is registered with the IMS); APPLE-1003, ¶102. Accordingly, it would have been obvious for the Horvath-Tsampalis-Tumminaro sending device 106 to choose one of the packet-switched bearers (*e.g.*, the 802.11 WiFi data bearer or the GPRS, EV-DO, or UMTS data bearer) for transmission of a SIP MESSAGE over packet-data network 102 to the IMS core. *Id.*

As one example, it would have been obvious for the sending device 106 to select a GPRS, EV-DO, or UMTS data bearer only when the sending device 106 is not in range of an accessible 802.11 WLAN access point (or in other limited circumstances), *e.g.*, because an 802.11 WiFi data bearer commonly provides higher transmission speeds and lower cost of service than the GPRS, EV-DO, or UMTS bearer. APPLE-1003, ¶103 (citing APPLE-1055, [0028]), [0029]-[0030], FIG. 2; APPLE-1056, [0008] (“[W]hen the device is within the area of coverage of a network that provides high speed Internet access, the device may switch from the network with which it was connected to the network with the high speed Internet

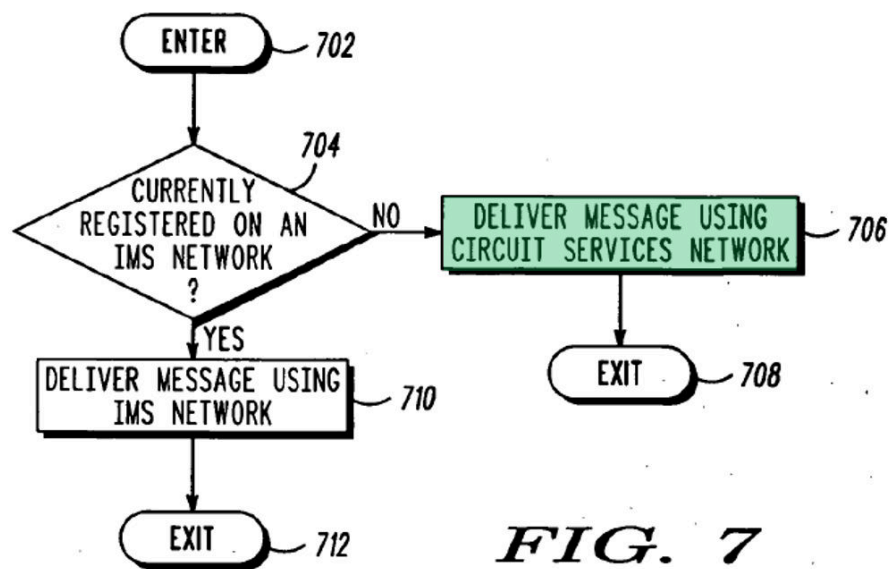
access. Similarly, the device may, for example, connect to networks that provide different quality of service, low cost service and/or different services (*e.g.*, voice, data, multimedia, etc.).”), [0002]-[0009]; APPLE-1068, Abstract (“portable devices to communicate ... via both cellular and WiFi”), [0006], [0032], [0034]).

In these situations, the Horvath-Tsampalis-Tumminaro wireless device would then transmit a SIP MESSAGE to the addressed recipient via the cellular base station (*e.g.*, using a GPRS-EV-DO, or UMTS packet-switched data bearer), ***at least where the packet-switched bearer supported by the WLAN base station is not chosen for message transmission*** (*e.g.*, where the sending device is not within an authorized 802.11 WLAN coverage area or where the cost, quality, or services offered by the GPRS, EV-DO, or UMTS bearer are determined to make it a better option than an available 802.11 WLAN bearer); APPLE-1003, ¶103.

Element [11]

Horvath discloses that when “wireless device 106 desires to transmit a SMS message to another device, the wireless device 106 first determines if it is registered on the packet data network 102.” APPLE-1004, [0050]. APPLE-1003, ¶104. “If the wireless device 106 is not registered on the packet data network 102, the wireless device 106 transmits the SMS messages using the traditional circuit services network method (for example, ANSI-41 procedures).” *Id.*; *see also id.*,

[0078] (“If the result of this determination is negative, the wireless device 106[] ... transmits the SMS message through the traditional circuit services network ...”). Horvath’s “process of the wireless device 106 selecting either the packet data network 102 or the circuit services network 104 for transmission of a SMS message” is shown in FIG. 7:



APPLE-1004, FIG. 7 (annotated)

According to Horvath, an SMS message transmitted from the sending device 106 “using the traditional circuit services network method” is sent to the short message service center (SMSC) 114 without traversing the IMS core (*server*). APPLE-1003, ¶105. This follows because the IMS core (*server*) is part of an “Internet Protocol multimedia system” configured to “process SIP signaling packets” transported over the “packet data network 102”—not SMS messages transmitted according to “the traditional circuit services network method,” *e.g.*,

using “ANSI-41 procedures.” APPLE-1004, [0034]-[0035], FIG. 2. Horvath specifically distinguishes transmission of an SMS message over the circuit-services network 104 from SMS transmission to the IMS core over the packet-data network 102, the latter of which involves “encod[ing] the IS-637 content” of the SMS message “as the payload of the SIP MESSAGE.” APPLE-1004, [0050]. FIG. 2 specifically illustrates the transmission path of an SMS message from the sending device 106 to the SMSC 114 using the traditional circuit-services method, which never traverses the IMS core:

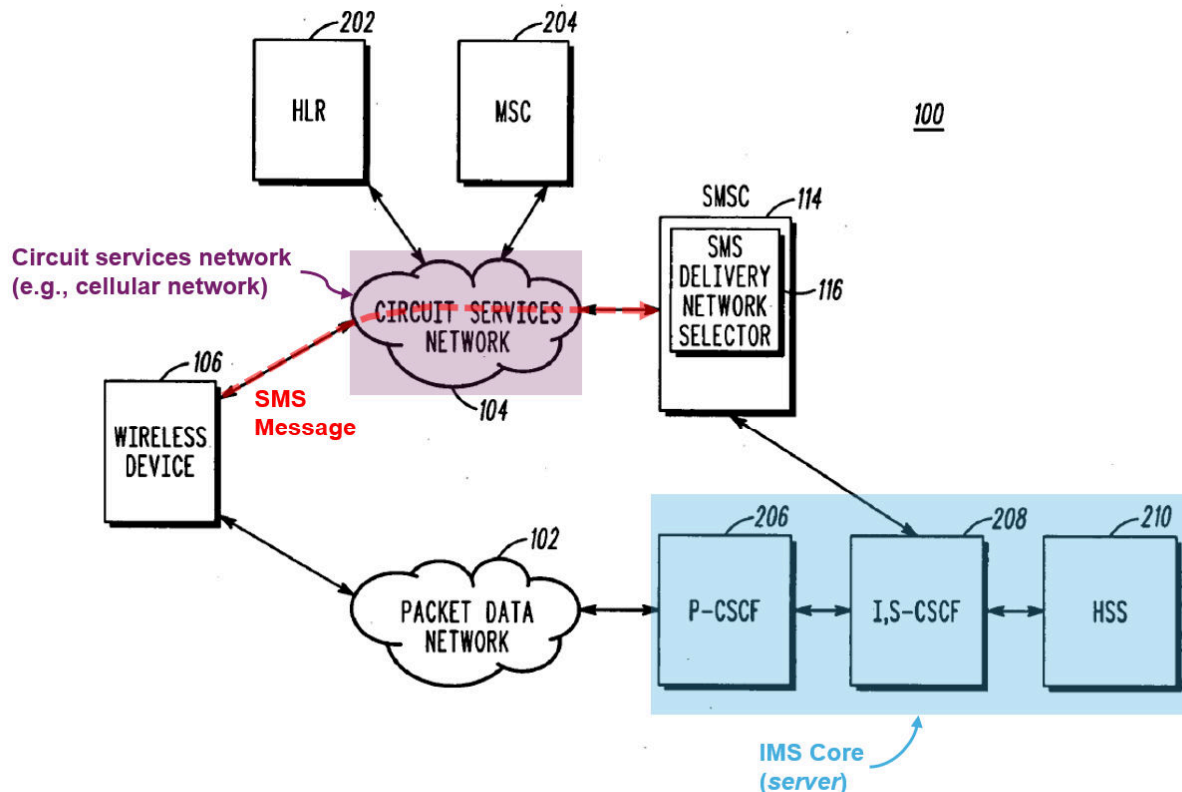


FIG. 2

APPLE-1004, FIG. 2 (annotated)

See also APPLE-1003, ¶105 (citing APPLE-1057, FIG. 1, [0063]-[0065], FIG. 2; APPLE-1058, 52 (FIG. 3.2), 54).

As discussed in [1b] and [1d], *supra*, the sending device 106 transmits SMS messages over the circuit-services network 104 ***via the cellular base station***. *Supra*, [1b], [1d]; APPLE-1003, ¶106. These SMS messages are specifically transmitted via the cellular base station to SMSC 114 ***before delivery to the addressed recipient***. *Id.* To this point, Horvath explains that “when a SMS message request is received by the SMSC 114, the SMSC 114 first determines if the [addressed recipient] device 106 is registered on the packet data network,” and if the recipient device is registered, “[t]he SMSC 114 delivers the SMS message to the recipient device through the packet data network 102 via the SIP network.” APPLE-1004, [0046]. “If the recipient device is not registered on the packet data network 102, the SMSC 114 delivers the SMS message to the recipient device through the traditional circuit services network method (for example, ANSI-41 procedures).” *Id.*, [0047]; *see also id.*, [0048]-[0049], [0053], FIG. 6.

Horvath’s functionality for transmitting SMS messages from the sending device 106 over the circuit-services network 104 under appropriate conditions is maintained in the combination with Tsampalis and Tumminaro. And in the combination, the sending device’s determination whether to transmit an SMS message using the traditional circuit-services method is based at least in part on the

addressed recipient's capabilities information in the *response failing to indicate that the addressed recipient corresponds to a subscriber of the [MMS or IM] service*. For example, the Horvath-Tsampalis-Tumminaro sending device implements Tsampalis's suggestions for allowing a message to be formatted for transmission as an SMS message if the addressed recipient has "limited messaging capabilities" and is therefore not a subscriber of an IM or MMS service capable of receiving richly formatted IM or MMS messages. APPLE-1005, [0062]-[0063] ("where the ... messaging format capabilities information 110 does not indicate compatibility with MMS messaging"); APPLE-1004, [0035], [0039]. When the recipient has limited messaging capabilities, the combination's sending device 106 "inform[s] the associated user ..., and suggests to the user to transform (format the message to an SMS formatted message and send it." APPLE-1005, [0062]. Automatic conversion to the SMS format also (while still providing the user with an option to abort) would have been obvious in some implementations based on Tsampalis's teaching that the sending device 100 may "not inform the user" of the recipient's limited messaging capabilities, thereby providing an even more efficient and seamless process that does not burden the user with choosing among message formats. *Id.*; APPLE-1003, ¶107.

As Tsampalis's teachings are applied to Horvath, the combination's sending device 106 would thus transmit an SMS message to the addressed recipient via the

cellular base station using the traditional circuit-services method based at least in part on a determination that the recipient has limited messaging capabilities *(failing to indicate that the addressed recipient corresponds to a subscriber of the [MMS or IM] service)*. For example, the sending device 106 would transmit an SMS message using the traditional circuit-services method when the addressed recipient has limited messaging capabilities, the sending device is not currently registered with the IMS (*e.g.*, the sending device may de-register at any time including after receiving the response of [1h] and for any reason including incidentally as a result of moving outside the coverage area of an 802.11 access point that provides access to the packet-data network 102), and no election is made to abort the conversion or formatting of the message as an SMS for transmission. APPLE-1004, [0047]-[0048]; *see also id.*, [0050], [0078], FIG. 7; APPLE-1005, [0052], [0072]; *supra*, [1i]; APPLE-1003, ¶108.

Element [1m]

As discussed in [11], *supra*, the combination's sending device 106 (***mobile wireless device***) transmits an SMS message to the addressed recipient via the cellular base station and through SMSC 114 before delivery to the addressed recipient, based at least in part on the response failing to indicate that the addressed recipient corresponds to a subscriber of the IM or SMS service. *Supra*, [11]; APPLE-1003, ¶109.

It was obvious that the SMS message transmitted by the Horvath-Tsampalis-Tumminaro sending device can be *limited to one or more binary-encoded characters*. For example, Tumminaro describes the sending device “encrypt[ing] a message” and sending the message as an “SMS message in binary rather than plain text.” APPLE-1034, [0561]; *see also id.*, [0539], [0566], [0653]-[0655].

Moreover, the SMS messages described in Horvath (and similarly in Tsampalis and Tumminaro) were limited to one or more binary-encoded characters, *e.g.*, up to a maximum of 140 bytes of raw data. This is evident from Horvath’s disclosure that wireless devices 106 and the network carry out SMS messaging according to the SS7 and ANSI-41 protocols. APPLE-1004, [0026], [0033] (“HLR 202 is a signaling system 7 (‘SS7 database’). SS7 is a set of telephony signaling protocols used to achieve connection control in a telephony network.”), [0050] (“transmits the SMS messages using ... ANSI-41 procedures”). SS7 and ANSI-41 protocols impose size limitations on SMS messages—a fact acknowledged even in the background discussion of the ’827 Patent itself. *See* APPLE-1001, 1:36-48 (“[O]ne of its biggest drawbacks is that an SMS message can only carry a small amount of data due to limitations imposed by the Mobile Application Part (MAP) protocol of SS7. An SMS message can only contain up to 160 8-bit alphanumeric or binary characters ...”); *see also* APPLE-1003, ¶110 (citing APPLE-1034, [0539]; APPLE-1035, [0090], [0088]-[0094], [0141]; APPLE-1036, 3:5-11;

APPLE-1059, 3).

Element [1n]

Tumminaro discloses “a mobile payment system where consumers may conduct transactions using a mobile device.” APPLE-1034, [0021]. Tumminaro’s “mobile payment platform” allows users to initiate transactions “through any number of means including SMS messaging, Web, e-mail, instant messenger, a mobile client application, an instant messaging plug-in application or ‘widget.’” *Id.*, [0031]; *see also id.*, [0204]-[0206], [0358] (“SMS messaging, email MMS messaging, instant messaging”), Abstract. Tumminaro explains that a mobile message (*e.g.*, an SMS message) for a payment transaction can include a “key word that provides the type of transaction requested,” “the amount” of the transaction, “the target telephone number,” and optionally additional information. *Id.*, [0204]-[0206]. A message intended for the mobile payment system can further include “a unique sequence number” derived by the mobile device that uniquely identifies the transaction, which can be used to “help prevent spoof attacks,” “prevent fraud,” and “avoid[] duplication of financial transactions.” *Id.*, [0607]-[0608]. In some implementations, “the sequence number may be any number, including a random number.” *Id.*, [0607]. The sequence number can also “be generated using a seed created from a hash function on information such as the telephone number, time of day, or other.” *Id.*; *see also id.*, [0042], [0398]-[0399],

[0548], [0552], [0559] (“SMS text message commands [are] sent to the server”), [0615], [0671], FIGs. 54-56; APPLE-1003, ¶111.

As described above in §IV.A.1.(d).(ii), *supra*, the combination’s sending device 106 incorporates Tumminaro’s suggested use of mobile messaging services (*e.g.*, SMS, MMS, and/or IM) to conduct mobile payment transactions. *Supra*, §IV.A.1.(d).(ii); APPLE-1003, ¶112. Tumminaro explains that “[w]hen an account holder makes a transaction request from their mobile phone, information is routed to the mobile operator,” and “[t]he information is then routed to the payment server through a secure Internet connection.” *Id.*, [0202], FIG. 3; *see also id.*, [0139], [0154] (“encompasses many mobile payment system implementations”). In the context of Horvath’s packet-data network 102, which includes an IMS-supported SIP network, and Horvath’s description of SIP MESSAGES carrying SMS, MMS, or IM messages being routed to corresponding application servers, it would have been obvious for the Horvath-Tsampalis-Tumminaro sending device 106 to transmit an SMS, MMS, or IM message containing Tumminaro’s payment transaction parameters in a SIP MESSAGE to the IMS core, which would route the message to an appropriate SMS, MMS, or IM application server (*e.g.*, SMSC 114, MMSC, or IM server), and which would in turn route the message over the Internet to a payment server as taught in Tumminaro. APPLE-1004, [0036]-[0040], [0050], FIG. 2; APPLE-1034, [0202].

Accordingly, it would have been obvious that the Horvath-Tsampalis-Tumminaro sending device (*mobile wireless device*) transmits payment transaction requests (*message content*) intended for a payment server (*third party provider*), to the IM or MMS application servers via the IMS core (*server associated with the service*), which forwards the transaction request (*message comprising the message content intended for the third party provider*), to the payment server (*third party provider*). A POSITA would have understood that the IMS core and the IM and MMS application servers are each *server[s] associated with the [IM or MMS] service* since the IM and MMS application servers process messages respectively transmitted via the IM and MMS services, and the IMS core handles SIP signaling, authentication, and routing of messages for the IM and MMS services within the SIP network. Further, as discussed above, the message routed to the payment server can include a “random number” that uniquely identifies the transaction associated with the message. APPLE-1034, [0607]-[0608], [0559]. The message forwarded to the payment server (*third party provider*) is therefore *derived at least in part from a random number* since it includes the random transaction number. APPLE-1003, ¶113.

Although claim 1 does not require that the server associated with the service derive the forwarded message by modifying the message from the mobile wireless device using a random number, it was nonetheless known and obvious before the

Critical Date to implement servers that performed these exact operations, *e.g.*, by replacing identifying information in a message with randomized anonymous information before delivering the message to the intended recipient. APPLE-1003, ¶114 (citing APPLE-1060, 6:59-7:5, 9:30-10:24, Abstract, FIGs. 3, 4b; APPLE-1061, Abstract; APPLE-1040, [024], [051]); *infra*, §IV.D.1; *cf.*, APPLE-1001, 11:26-36. A POSITA would have found it obvious to similarly replace identifying information in messages sent from the Horvath-Tsampalis-Tumminaro wireless device to the payment server or to other user devices to mask the identity of the sender and provide improved privacy protections and security. A POSITA would have reasonably expected success since such techniques involve conventional message processing techniques that were well known by the Critical Date. *Infra*, §IV.D.2.

3. Claim 7

Element [7]

Supra, [1m]. For example, the combination's sending device transmits an SMS message limited to 140 bytes (*e.g.*, 160 7-bit characters, 140 8-bit characters, or 70 16-bit characters) (***limited to less than a maximum allowable number of binary-encoded characters***). APPLE-1003, ¶115; *cf.* APPLE-1001, 1:42-48 ('827 Patent also disclosing SMS message limited to 160 binary characters).

4. Claim 11

Elements [11pre]-[11c]

Tumminaro discloses the conventional practice of encapsulating requests that a client device sends to a server over a packet-switched network (like the request that the sending device 106 sends to the IMS core (*supra*, [1g])) in HTTP. APPLE-1034, [0901] (“A protocol for communicating with the system may be selected, such as HTTPS, HTTP, or SMS.”), [0806] (“changing the protocol (*i.e.*, SMS or HTTP) that they use to send and receive payment information between their mobile device and the server”), [0156], [0161], [0203], [0573]. A POSITA would have found it obvious to encapsulate the request in HTTP as taught in Tumminaro because HTTP was a well known, reliable, and commonly implemented protocol allowing communication of requests and responses between sending device and the server. For similar reasons, it would have been obvious to encapsulate a message sent from the sending device 106 to the addressed recipient in HTTP (*e.g.*, the addressed recipient may be another user device or a third-party

⁷ The specification of the '827 Patent does not describe encapsulation of any message or data, the word “*encapsulated*” or its alternative forms (*e.g.*, encapsulation/encapsulating/encapsulate) does not appear in the specification. APPLE-1003, ¶116.

provider like Tumminaro's payment server). *Id.* Tumminaro describes the benefits of being able to select different messaging protocols for communicating with a sending device, including options that employ HTTP. APPLE-1034, [0901]; *see also id.*, [0156], [0161], [0203], [0573], [0806]; APPLE-1003, ¶116 (citing APPLE-1042, [0003]-[0004], [0010], [0035], [0050], [0061]-[0062], [0067] (describing known options for HTTP-based messaging)).

A POSITA also would have found it obvious that the IMS core (“*server that receives packet-switched messages...*” and “*server that maintains the subscriber list*”) is located outside of the cellular network. As discussed in greater detail above with respect to [11], the sending device 106 transmits an SMS message to the addressed recipient via the cellular base station without traversing the IMS core (*server*) because the IMS core resides in Horvath's packet-data network 102—not the cellular network. *Supra*, [11]; *see also supra* [1pre] and [1g] (mappings to the claimed “server[s]”); APPLE-1004, [0024]-[0025], [0031]-[0034], FIG. 2. For example, where the packet-data network 102 includes an 802.11 network as described in Horvath, the IMS core may reside in the 802.11 network or the Internet (or other portion of the packet data network 102) rather than any cellular network. APPLE-1004, [0024]-[0025]. Even where the packet-data network 102 includes GPRS, EV-DO, or UMTS, it would have been obvious to implement the IMS core outside the GPRS, EV-DO, or UMTS cellular networks because the IMS

is commonly implemented outside the cellular network. APPLE-1003, ¶117 (citing APPLE-1052, FIG. 1 (depicting IMS outside of the cellular network); APPLE-1046, FIG. 4 (depicting Internet (where the IMS may be implemented) outside of the cellular network)).

5. Claim 16

Element [16]

Horvath discloses that sending device 106 “registers with the IMS network” and the home subscriber server (HSS) 210 in the IMS core maintains a “database including profiles associated with each wireless device 106 registered with the IMS.” APPLE-1004, [0034]-[0035]. The information stored by HSS 210 “includes information to identify each registered wireless device 106 such as a telephone uniform resource identifier (‘tel-URI’) and/or a SIP uniform resource identifier (‘SIP-URI’).” *Id.*, [0035]. The “SIP registration[] ... allows the S-CSCF to bind the location of the wireless device 106 (for example, the IP address of the device) and the SIP address.” *Id.*, [0038]. The sending device 106 (*mobile wireless device*) thus registers a “tel-URI” and/or a “SIP-URI” (*a user name tag or handle*) with the IMS SIP network, which implements the MMS and IM services (*service*). *Supra*, [1pre]; APPLE-1004, [0033], [0039]; APPLE-1003, ¶118 (citing APPLE-1026, §4, §19.1; APPLE-1044, 1-3; APPLE-1045, 4-5, 7).

Horvath-Tsampalis-Tumminaro also renders obvious the sending device 106 *transmitting an authentication identifier to the service*. According to Horvath, “[t]he P-CSCF 206 is a SIP proxy and is the first contact point for a wireless device 106 registered in the IMS network.” APPLE-1004, [0036]. “The wireless device 106 locates its respective P-CSCF 206” and “[a]ll signaling messages are intercepted by the P-CSCF 206.” *Id.* “The P-CSCF 206 authenticates the wireless device 106.” *Id.* “[A]fter successful registration of a wireless device 106 with the S-CSCF component of the I, S-CSCF 208, security keys are sent to the P-CSCF 206, which allows it to setup a security association with the wireless device 106.” *Id.*; *see also id.*, [0035]-[0036], [0038], [0040]-[0041], [0072]-[0073], FIG. 5. By locating the P-CSCF 206 and transmitting signaling messages that allow the P-CSCF 206 to perform authentication, the sending device 106 *transmit[s] an authentication identifier* to the IMS, which implements the MMS and IM services (*service*). *See also* APPLE-1004 (“P-CSF 206 ... is trusted by the other IMS components” including the application servers, “which therefore do not perform further authentication of the wireless device 106”). Moreover, Horvath explains that “[t]he basic functions of an IMS network should be known to those [of] ordinary skill in the art,” and it would have been obvious therefore for the IMS described in Horvath to implement standard SIP authentication protocols in which user agents (*e.g.*, device 106) transmit authentication identifiers to the service such

as a signed message, username, password, and/or credentials. APPLE-1003, ¶119 (citing APPLE-1044, 15; APPLE-1026, 193-201).

6. Claim 17

Element [17]

As discussed in [1g]-[1h], *supra*, the combination's sending device 106 requests and receives messaging capabilities information for the addressed recipient of a message. *Supra*, [1g]-[1h]. Further as discussed in [1g]-[1h], *supra*, it would have been obvious that the capabilities information returned to the sending device 106 would include an indication whether the addressed recipient is currently registered with the IMS and capable of receiving messages over services (e.g., MMS, IM) provided by the IMS. *Id.* Information indicating that the addressed recipient is currently registered with the IMS itself constitutes an indication that the addressed recipient is authenticated to the IMS and thus authenticated to the MMS and IM *services* (which are at least partially implemented on the IMS) because the addressed recipient must authenticate to register with the IMS. APPLE-1004, [0035] (“P-CSCF 206 authenticates the wireless device 106” and “after successful registration of a wireless device 106” the P-CSCF 206 “set[s up] a security association with the wireless device 106”), [0040] (“authentication and authorization of the wireless device 106”), [0041],

[0072] (“authenticates and registers the wireless device 106 with the IMS core”); APPLE-1003, ¶120 (citing APPLE-1044, 15; APPLE-1026, 193-201).

7. Claim 18

Element [18]

Horvath teaches that a sending device 106 communicates via the IMS core (*server*) and SIP network only if the sending device 106 registers with the IMS. APPLE-1004, [0050], [0077]-[0078], FIG. 7. The IMS implements aspects of the IM and MMS services (*service*), and as discussed above (*supra*, Claim [17]), each wireless device 106 that registers and communicates through the IMS must first be authenticated. *Supra*, [1pre], [17]; APPLE-1004, [0036]-[0041], [0072], FIG. 5. Accordingly, the Horvath-Tsampalis-Tumminaro sending device 106 would not be enabled to transmit messages via the IMS core (*server*) before authentication of the device 106 to the IMS, and thus to the MMS and IM services supported by the IMS. For example, just as Horvath teaches that the sending device 106 is not enabled to transmit SMS messages through the IMS over packet data network 102 if the device 106 is not registered (and thus not authenticated) with the IMS, the sending device 106 would likewise not be enabled to transmit MMS or IM messages via the IMS core before authentication and registration since registration and authentication to the IMS core provides the sending device with access to each of the services on the IMS. APPLE-1004, [0036], [0041] (“does not have to

authenticate the wireless device 106 because the S-CSCF 206 has already done so”), [0050], [0077]-[0078], FIG. 7; APPLE-1003, ¶121.

8. Claim 19

Element [19]

Horvath discloses that the sending wireless device 106 registers with the IMS by transmitting information that allows the “S-CSCF to bind the location of the wireless device 106 (for example, the IP address of the device) and the SIP address.” APPLE-1004, [0038]; *see also id.*, [0035] (“The HSS 210 also provides information about the physical location [of wireless devices 106] to requesting entities such as the SMSC 114.”), [0037] (“retrieves the location of the wireless device 106”), [0003] (“transmits ... device’s status and current location”). A POSITA would have understood that the sending device 106 thus transmits ***location information*** (e.g., IP address) to the IMS core to enable the S-CSCF to bind the device’s location information to the SIP address. APPLE-1003, ¶122 (citing APPLE-1026, 17); *see also id.*, APPLE-1004, [0070] and FIG. 4 (disclosing GPS module 106 used to “determine the location” of the device 106); *cf.* APPLE-1001, 11:26-30 (minimal description regarding the recited “***location information***”).

Also in the combination, Tumminaro discloses that “location technology” can be used to “determine the physical location of the device,” which allows

“services made available to the account holder [to] be adjusted based on where they are located.” APPLE-1034, [0613]; *see also id.*, (“locationName •String value that identifies where the transaction occurred, for instance, a store ID or an ATM ID”), [0589], [1059]-[1070]. Accordingly, it would have been obvious further based on Tumminaro’s teachings for the Horvath-Tsampalis-Tumminaro sending device 106 to transmit location information in messages intended for the payment server (*third-party provider*) to enable the payment server to make location-based service adjustments. APPLE-1003, ¶123.

9. Claim 20

Element [20]

As discussed in [19], *supra*, the Horvath-Tsampalis-Tumminaro sending device 106 transmits location information in messages intended for the payment server (*third-party provider*) to enable the payment server to make location-based service adjustments. APPLE-1034, [0613], [1078], [0527]-[0528] (“the shopper can conclude a purchase transaction with the payment server handling the details such as ‘ship to’ address and funds transfer....the account holder has the option to select a ‘deliver to the current geographical location’ rather than the account holder’s billing address”), [0589], [1059]-[1070]; *supra*, [19]. Because the payment server implements payment transactions and is responsible for making location-based adjustments, it would have been obvious that the message

forwarded to the payment server is derived at least in part from the location information indicating the location of the sending device 106. *Id.*; *see also supra*, [1n]; APPLE-1003, ¶124; *cf.* APPLE-1001, 11:26-30.

10. Claim 21

Element [21]

Horvath teaches that a sending device 106 communicates via the IMS core (*server*) and SIP network only if the sending device 106 registers with the IMS. APPLE-1004, [0050], [0077]-[0078], FIG. 7. The IMS implements or is connected to the IM and MMS services (*service*), and as discussed above (*supra*, Claim [17]), each wireless device 106 that registers and communicates with the IMS must first be authenticated. *Supra*, [1pre], [17], [18]; APPLE-1004, [0036]-[0041], [0072], FIG. 5. It follows that the sending device 106 would not receive from the IMS a *response* containing an addressed recipient's capabilities information (*supra*, [1g]-[1h]) until the sending device 106 was registered and authenticated with the IMS, and thus authenticated to the IM and MMS services supported by the IMS. *Supra*, [18]. Authenticating prior to receiving the response also would have been obvious to improve security and prevent unauthorized leaks of information about registered devices that would be contained in the response from the IMS to non-authenticated devices. *Id.* Indeed, Horvath expressly teaches that a wireless device 106 must be registered (and hence authenticated) with the IMS for any messages to be delivered

from the IMS to the device 106. APPLE-1004, [0045]-[0047], [0075]-[0076], FIG. 6. Horvath further teaches that the wireless device 106 uses a SIP contact address for registration and authentication, where the contact address can be a “telephone uniform resource identifier (‘tel-URI’)” corresponding to “the telephone number assigned to the wireless device 106” (*mobile phone number of the mobile wireless device*). *Id.*, [0035]; APPLE-1003, ¶125 (citing APPLE-1026, 36, 60, 157-158 (details of “tel URL”)).

11. Claim 23

Element [23]

As described in [1m], *supra*, SMS messages transmitted by the sending device 106 over circuit-services network 104 include *signaling system 7 (SS7)* messages limited to one or more binary-encoded characters. *Supra*, [1m]; APPLE-1003, ¶126.

12. Claim 25

Element [25]

As discussed in [1h], *supra*, the sending device 106 in the combination can receive a *negative response indicat[ing] that the wireless device of the addressed recipient is not a subscriber of the service* (e.g., a response indicating that the device has “limited capabilities” or a response that otherwise lacks information indicating that the device is subscribed to the MMS or IM services). *Supra*, [1h].

Horvath further explains that a wireless device “may not be registered ... because it never was registered to begin with,” in which case “an IMS contact address[] ... does not exist” for the device. APPLE-1004, [0047], [0076]. A negative response is thus consistent with the addressed recipient having never registered with the IMS to begin with such that no IMS contact address exists for the recipient (*unknown to the server that maintains the subscriber list*). APPLE-1003, ¶127.

13. Claim 26

Element [26]

As discussed in [1n], *supra*, it would have been obvious for the *random number* from which the message forwarded to the payment server (*third party provider*) is derived to be generated by the IMS core or the IM or MMS application servers (*server associated with the service*). *Supra*, [1n]; APPLE-1034, [0021], [0031], [0204]-[0206], [0358], [0559], [0607]-[0608]; APPLE-1003, ¶128 (citing APPLE-1060, 6:59-7:5, 9:30-10:24, Abstract, FIGs. 3, 4b; APPLE-1061, Abstract).

14. Claim 27

Element [27]

As explained in [1b], *supra*, the sending device’s cellular transceiver and a cellular base station in the combination system communicate using EV-DO, GPRS, or UMTS protocols (*a radio communications protocol that supports transmission*

of multimedia messages comprising at least one of images, audio clips, or videos). *Supra*, [1b]. EV-DO, GRPS, and UMTS each define protocols that support **MMS messages**. APPLE-1004, [0024]-[0025] (“[MMS] and the like are also included in the networks 102”); APPLE-1003, ¶129 (citing APPLE-1048, 6-9 (describing UMTS, GPRS, EV-DO support for multimedia transmissions including MMS)).

15. Claim 29

Element [29pre]

Supra, [28pre].

Element [29a]

As discussed with respect to [1pre], *supra*, Horvath describes “instant messaging” (IM) as a **service for receiving packet-switched messages** (other than SMS, EMS, and MMS) that is supported by the IMS on the packet-switched SIP network. APPLE-1004, [0033], [0039], FIG. 2; *supra*, [1pre]; APPLE-1003, ¶131 (citing APPLE-1044, 1-4 (RFC disclosing details of SIP-based instant messaging)).

Horvath also describes that the wireless device 106 “transmit[s] a SIP register message to the IMS core,” which supports the SIP capabilities used to establish instant messaging, and the S-CSCF (part of the SIP network and IMS core) “receives the SIP register message.” APPLE-1004, [0033] [0040] (“The

wireless device 106 registers with the S-CSCF component of the I, S-CSCF 208.

When the S-CSCF receives a registration request from the wireless device 106, the S-CSCF contacts the HSS 210 for authentication and authorization of the wireless device 106.”), [0071]-[0073] (“The wireless device 106, at step 504, registers with the IMS core by transmitting a SIP register message to the IMS core. The S-CSCF component of the I, S-CSCF 20S, at step 506, receives the SIP register message.”), FIG. 5 (below); APPLE-1003, ¶132.

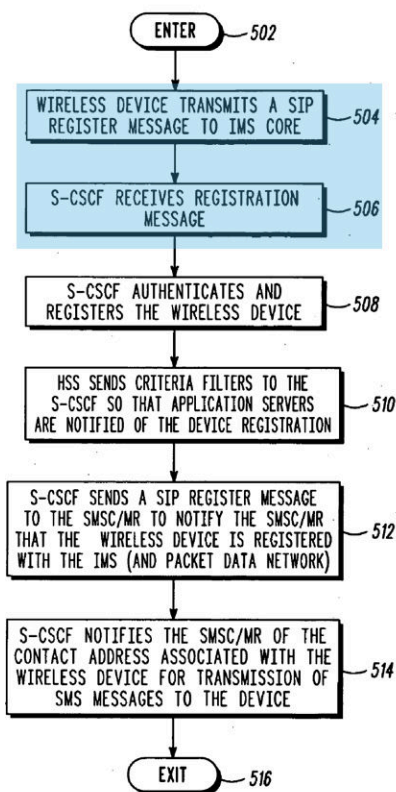


FIG. 5

APPLE-1004, FIG. 5 (annotated)

The “SIP register message” (*subscription message*) received by the IMS core from a first wireless device 106 effects a subscription to the IM service (*for subscribing the first mobile wireless device to a service*) since the registration allows the first wireless device 106 to access services and receive messages via services supported by the SIP network including IM. APPLE-1004, [0034] (“wireless device 106 registers with the IMS network”), [0038] (“SIP registration[] allows the S-CSCF to bind the location of the wireless device 106 (for example, the IP address of the device) and the SIP address” such that “services subscribed to by the device 106 can be provided”), [0041] (“HSS 210 includes filter criteria for the wireless device 106 that causes registration events to be sent” to a “SIP application server”), [0042] (“subscribes to a registration event package”); APPLE-1003, ¶133 (citing APPLE-1026).

Thus, when the IMS core receives a SIP register message from a first wireless device 106, the location (*e.g.*, IP address) is registered with the SIP network and application servers (including an application server for the IM service) are notified of the device 106’s registration. This allows the IM service to deliver IMs and related packet-switched messages from the service (*e.g.*, presence information) to the wireless device 106 using registered location (*e.g.*, IP address) of the device. Accordingly, registration allows the wireless device 106 to receive or access messages from the IM service, indicating that the SIP register message is

a ***subscription message*** that effects subscription of the device 106 to the IM service. APPLE-1062. Indeed, Horvath explicitly notes that the device's registration is stored in "home subscriber server 210," which "comprises a database including profiles associated with each wireless device 106 registered with the IMS," where the "profile[] ... includes subscription related information." APPLE-1004, [0035]; *see also id.*, [0040]-[0041], [0072]-[0076], FIG. 5. Horvath also acknowledges that "[t]he basic functions of an IMS network should be known to those [of] ordinary skill in the art," and this being the case, a POSITA also would have found obvious that the first wireless device 106 would send subscription messages to the IMS core both to sign-up for IM service and to receive presence information indicating the availability of other IM users consistent with commonly implemented IMS, SIP, and IM standards. APPLE-1003, ¶134 (citing APPLE-1043, 1; APPLE-1063, 8; APPLE-1064, 3). These additional forms of subscription messages are consistent with Horvath's teaching to implement instant messaging on the SIP network and to allow the first wireless device 106 to access the IM service and receive presence information indicating the availability of other subscribers of the IM service.

In addition, a POSITA would have found obvious that, in the combined system and in accordance with Horvath's teachings, the IMS core would receive ***subscription message[s]*** (e.g., SIP register message or SUBSCRIBE request) from

a first mobile wireless device 106 *via the Internet*, for at least the reasons described in [1a] and 1[g], *supra*, that messages are received by the IMS core over the Internet when the sending device 106 transmits over packet-data network 102. *Supra*, [1a], [1g]; APPLE-1003, ¶135. For example, Horvath discloses the packet network 102 being “an Internet Protocol (‘IP’) connectivity network.” APPLE-1004, [0009], [0021], [0024], [0050]; APPLE-1005, [0028].

Element [29b]

As discussed in [1g] and [29a], *supra*, Horvath discloses HSS 210 storing a “subscriber profile” (*storing information...in a subscriber data store*) for “each wireless device 106 registered with the IMS.” APPLE-1004, [0035]; *supra*, [1g], [29a]. “A profile[] ... includes subscription related information.” APPLE-1004, [0035]. Further, the IMS system includes “application servers that host and execute services for the wireless device 106,” namely “services subscribed to” including an instant messaging (IM) service. APPLE-1004, [0033], [0038]-[0039]. For example, “[t]he S-CSCF [] determines which application server(s) to forward the SIP message associated with the wireless device 106 so that the services subscribed to by the device 106 can be provided.” *Id.*, [0038]. “The HSS 210 also includes information to identify each registered wireless device 106 such as a telephone uniform resource identifier (‘tel-URI’),” where the “tel-URI, for

example is the telephone number assigned to the wireless device 106.” *Id.*, [0035]; APPLE-1003, ¶136.

Furthermore, Horvath teaches that the IMS core can determines that the wireless device is not registered with the SIP/IMS network establishing IM if “an IMS contact address” such as tel-URI “does not exist for the wireless device,” while if the wireless device is already registered with the SIP/IMS network, then “an IMS contact address...exists for the wireless device.” APPLE-1004, [0072]-[0076]; *see also* [0041] (“A subscriber profile sent to the S-CSCF includes the filter criteria which are used by the S-CSCF to determine the application servers that are to be notified that they are to provide services for the wireless device 106.”). A wireless device 106 whose tel-URI is registered and associated with the IM service indicate that the device 106 is a subscriber to the IM service. APPLE-1003, ¶137.

Accordingly, it would have been obvious that the Horvath-Tsampalis-Tumminaro system stores in the IMS core (*e.g.*, within HSS 210) a subscriber profile for a first wireless device 106 indicating that the device is a subscriber of an IM service (*information indicating that a first mobile phone number of the first mobile wireless device corresponds to a subscriber of the service, in a subscriber data store*). APPLE-1003, ¶138.

Element [29c]

As discussed in [1g], *supra*, the IMS core receives a first request from a second mobile wireless device 106 that intends to send a message to a first mobile wireless device 106 for the first mobile wireless device's messaging capabilities information (including subscription related information). *Supra*, [1g]; APPLE-1003, ¶139.

Element [29d]

As discussed in [1g], *supra*, the IMS core determines responses to sending wireless devices' requests for the messaging capabilities of intended recipient devices. *Supra*, [1g]. Determining responses to such requests includes determining whether the intended recipient is a subscriber capable of messaging according to each of multiple different formats supported by different messaging services (*e.g.*, SMS, MMS, IM). *Id.* For example, Tsampalis discloses that a recipient device's capabilities information can "assign[]" to each messaging format "an associated value" that indicates "yes" or "no" whether the recipient device supports that format. APPLE-1005, [0060]. In some implementations, a network element (*e.g.*, a server) determines the capabilities of a recipient device in response to a request by generating a "new capabilities signal" that indicates whether the recipient is capable of messaging according to a particular format. *See* APPLE-1005, [0058] (describing a first value in a new capabilities signal that "indicate[s]

that the message type ... is unsupported” and a second value indicating otherwise), [0059], [0057], [0025], [0039], FIGs. 13-15. Horvath likewise discloses that a component of the IMS core (*e.g.*, S-CSCF) determines each service that a wireless device is subscribed to in response to a request so that the request can be forwarded to the application servers for the “services subscribed to by the device 106.”

APPLE-1004, [0038]; *see also id.*, [0035] (identifying wireless devices by a “tel-URI” phone number), FIG. 2. As discussed above (*supra*, [1g]), the request would be processed by the ***subscriber data store*** (*e.g.*, the IMS core including HSS 210). *Supra*, [1g]; APPLE-1004, [0035], [0038]-[0044]. Accordingly, it would have been obvious that the Horvath-Tsampalis-Tumminaro combination determines, via the subscriber data store, in response to receiving a first request from a second mobile device, that the first mobile phone number of a first mobile wireless device, corresponds to a subscriber of the IM service. APPLE-1003, ¶140.

Element [29e]

Supra, [29d], [1h]. APPLE-1003, ¶141.

Elements [29f]-[29g]

The IMS core in the combination receives requests and transmits responses like those recited in [29f]-[29g] for each of the reasons described in further detail above with respect to [1g]-[1h] and [29c]-[29e]. *Supra*, [1g]-[1h], [29c]-[29e]. It

also would have been obvious for the same mobile device, *e.g. the second mobile device*, to request messaging capabilities information for multiple intended recipient devices that each have different phone numbers. For example, Tsampalis describes scenarios in which “there are multiple remote recipients,” in which case the sending mobile device (*second mobile device*) obtains capabilities information for each recipient and determines how to format and transmit a message to each recipient according to the recipient’s respective capabilities. APPLE-1005, [0062]-[0063], [0035] (“each such recipient ID 402 is checked”). Tsampalis also describes that some recipients may support rich messaging capabilities such as MMS (or IM) while others do not. *Id.* Accordingly, it would have been obvious that the Horvath-Tsampalis-Tumminaro server receives a *second request*, from the sending wireless device 106 (*second mobile wireless device*) including at least *information corresponding to another phone number*, and transmits a *second response* to the sending wireless device 106 *indicating that the another phone number does not correspond to a subscriber of the service*. APPLE-1003, ¶142.

Element [29h]

Supra, [1n]; APPLE-1003, ¶143.

16. Claim 30

Element [30]

As discussed in [1n], *supra*, the IMS core (optionally including IM application server) or the IM application server themselves alternately provide a ***server associated with the IM service*** that forwards a message from the sending device 106 (***mobile wireless device***) to a payment server (***third-party provider***). *Supra*, [1n]. Further, for the reasons discussed in [25] and [29g], *supra*, the server determines that ***the another phone number*** does not correspond to a subscriber of the IM service on the IMS, and this is consistent with ***another mobile wireless device associated with the another phone number*** being unknown to the IMS servers that maintain the subscriber list. *Supra*, [25], [29g]. Because devices must be registered with the IMS to perform messaging via the IMS (including the IMS core and application server), it would have been obvious that neither the IMS core nor the IM application server would receive message content from the ***another mobile wireless device associated with the another phone number*** that is not registered with the IMS and not subscribed to the IM service. *Id.*; *see also supra*, [21]. Per Horvath's teachings, a device that is not registered with the IMS would transmit the message as an SMS to the SMSC 114 (which would then be responsible for forwarding the message to the payment server), bypassing the IMS core and IM application server. APPLE-1004, [0050], [0077]-[0078], FIG. 7; APPLE-1034, [0021], [0204]-[0206], [0358] ("SMS messaging"). Even if the ***another mobile wireless device*** sent the message using as an IM using SIP

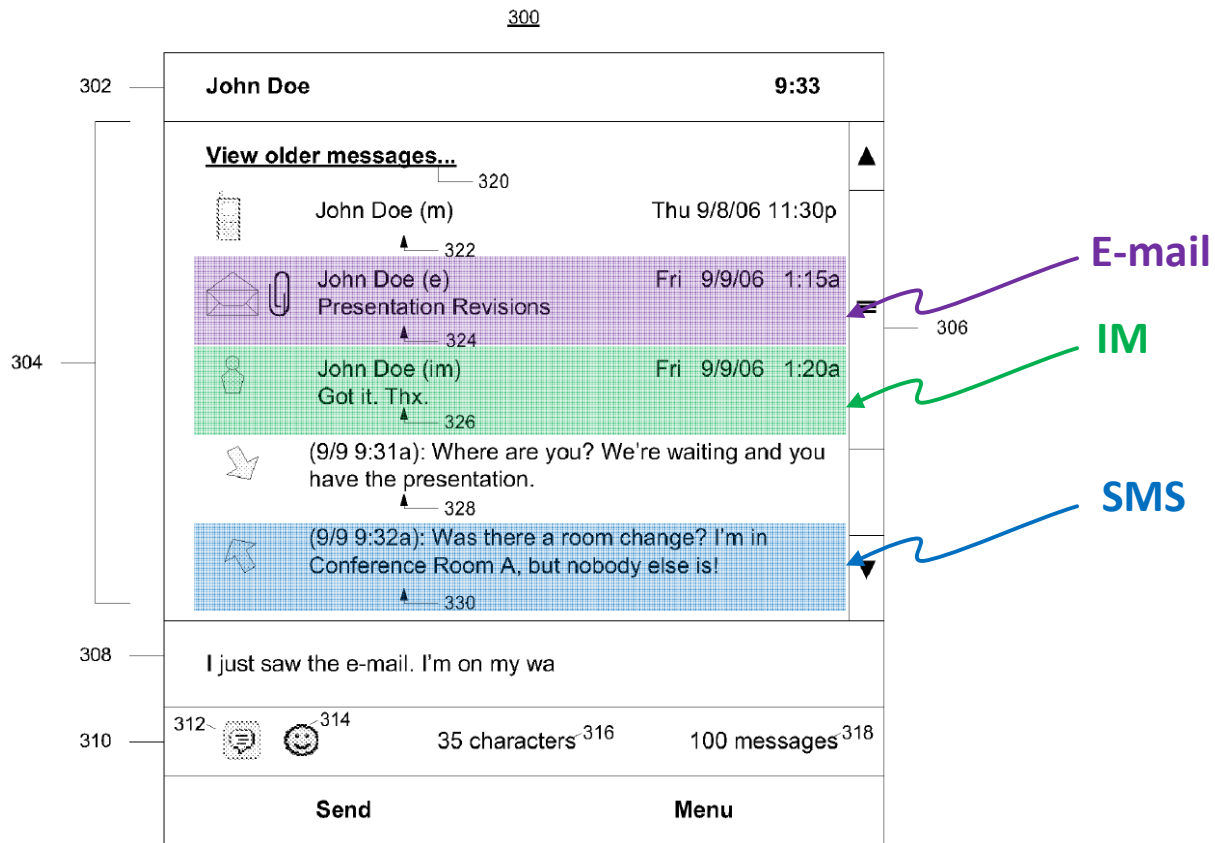
protocols, it would have been obvious that a different IMS server including a different P-CSCF 206, *i.e.*, a server other than the *server associated with the IM service*) would receive the message if the *another mobile wireless device* were located in a different region or the DHCP protocol otherwise assigned the device a different P-CSCF 206. APPLE-1004, [0036]-[0038]; APPLE-1003, ¶144.

**B. GROUND 1B – Horvath-Tsampalis-Tumminaro-Kansal
Renders Obvious Claims 9, 12-13, 22, and 24**

1. Proposed Combination

(a) Kansal (APPLE-1053)

Like Horvath and Tsampalis, Kansal describes a multi-modal messaging environment for sending and receiving messages of different formats. APPLE-1053, Abstract, [0009], [0035] (“an IM application,” “an SMS application,” and “an MMS application”). Kansal presents a tool for correlating and aggregating for display all messages received by a “particular recipient,” including each of several message types/formats (*e.g.*, SMS, IM, MMS). APPLE-1053, [0009]; [0040]-[0043]; [0066]-[0069]; FIGs. 2-3 (shown below); APPLE-1003, ¶¶42-43.



APPLE-1053, FIG. 3 (annotated)

As shown above, Kansal describes a “unified messaging UI” from which a user may view received messages of various types and may select from a variety of types when composing and sending a response, demonstrating the utility and viability of integration. APPLE-1053, [0062], [0077]-[0078]; *see also id.*, [0009], [0045]-[0046], [0054]-[0056], [0062]-[0064], [0070], FIGs. 2-3; APPLE-1003, ¶43.

(b) The Horvath-Tsampalis-Tumminaro-Kansal Combination

It would have been obvious to further modify the Horvath-Tsampalis-Tumminaro combination from Ground 1A to incorporate a unified messaging interface in the sending and/or receiving wireless devices as taught in Kansal. *Supra* §§IV.A.1(d), IV.B.1(a). Multiple reasons would have prompted a POSITA to implement this combination. APPLE-1003, ¶178.

First, a POSITA would have been motivated to apply Kansal's suggestion for a unified-messaging user interface to the wireless device in the combination to improve the user's experience with mobile messaging services involving messages of different types (*e.g.*, SMS, MMS, IM). This would have furthered Kansal's stated goals to meet the "need for an improved apparatus and methods for providing enhanced mobile messaging services." APPLE-1053, [0002]. For example, correlating messages in a manner that allows a user to view all messages of various types involving a particular user at a glance in a single thread would advantageously allow a user to see all messages received from particular senders within a single interface without needing to navigate to different messaging applications or interfaces for each different message type. APPLE-1003, ¶179 (APPLE-1066, 1-2 (a multi-protocol messaging application providing "a powerful and efficient user

experience.”)); APPLE-1053, [0009], [0045]-[0046], [0054]-[0056], [0062]-[0064], [0070], [0077]-[0078], [0086], FIGs. 2-3.

Second, providing a single thread of messages would have predictably improved the user interface by providing additional contextual information for a user of the wireless device. For example, Kansal explains that the thread can be “sorted in various ways such as by time of receipt.” APPLE-1053, [0049]; *see* FIGs. 2-3; APPLE-1003, ¶180.

Third, Applying Kansal’s suggestion for a unified messaging interface for each of these services in the context of references with the same services to obtain a substantially similar result would have been obvious as a matter of law. *KSR*, 550 U.S. at 417 (2007); *Intel*, 61 F.4th 1373, 1380-81 (Fed. Cir. 2023). APPLE-1003, ¶181.

A POSITA would have reasonably expected success implementing the combination as the messaging and communication protocols involved were all well known before the Critical Date. APPLE-1003, ¶182.

2. Claim 9

Elements [9pre]-[9b]

Horvath discloses that the sending device 106 has a “visual notification (or indication interface 440)” that “can be used as an alert by displaying a sequence of colored lights or a single flashing light on [a] display 444 or LEDs...when the

wireless device 106 receives a message, or the user missed a call,” where display 444 is “for displaying information to the user of the wireless device 106.” APPLE-1004, [0068], [0070], FIG. 4 (below); APPLE-1003, ¶183.

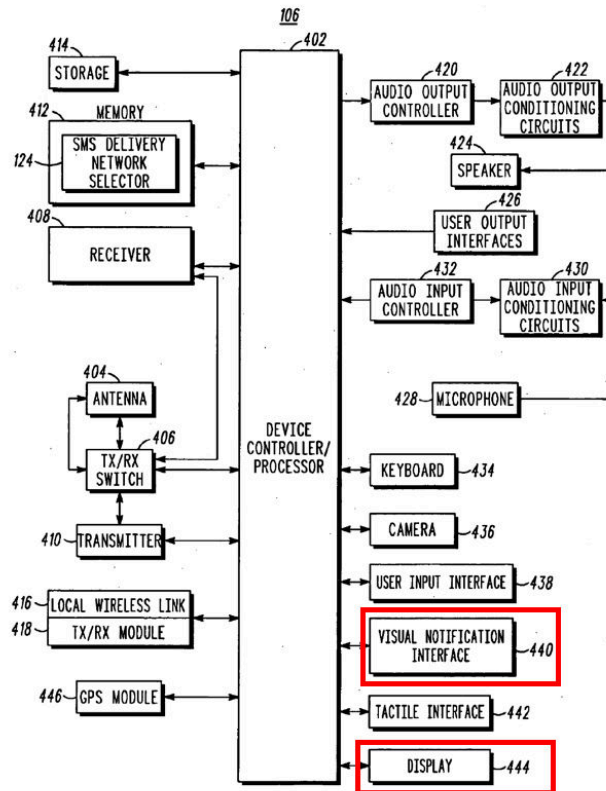


FIG. 4

APPLE-1004, FIG. 4 (annotated)

Also in the combination, Kansal discloses that “an IM icon” displayed in the unified messaging UI “may indicate whether the contact is currently online and available to receive an IM message” (*presence information associated with the wireless device of the addressed recipient*). APPLE-1053, [0062], FIG. 3. A

POSITA would have found obvious that the combination's sending device 106 *receives the presence information associated with the wireless device of the addressed recipient if the wireless device of the addressed recipient corresponds to a subscriber of the service* because subscribers of the IM service like those in Kansal publish their presence information to allow other subscribers (*e.g.*, on a Buddy list) to know when they are available to receive messages. APPLE-1053, [0062]; APPLE-1003, ¶184 (citing APPLE-1007, Abstract; APPLE-1064, 2); *supra*, [1g]-[1h] (describing IMS core returning to the sending device presence information in the form of indications of current registration status of other devices).

3. Claim 12

Element [12]

Kansal describes a wireless device having a “contacts database” of a message client “arranged to store contact records for individuals or entities specified by the user.” APPLE-1053, [0037]. “The contact record for an individual may comprise identifying information such as first name, last name, ... [and] e-mail address” *Id.* “The contacts database 142 may be used or accessed when receiving and/or sending messages.” *Id.*, [0038]. “For example, the user of the mobile computing device 100 may search for and open the contact record of a particular individual to initiate communication.” *Id.* Accordingly, it would have

been obvious that the Horvath-Tsampalis-Tumminaro-Kansal sending device 106 retrieves an e-mail address (*information representative of at least one electronic mail (email) address of another wireless device of another recipient*) to initiate an e-mail communication with another recipient. APPLE-1003, ¶185; *see also supra*, Ground 1A at [1f]. Kansal and Tsampalis also address and render obvious the common situation in which contacts subscribe to different messaging services and some contacts subscribe to the same service (*e.g.*, multiple subscribers of the IM service) (*the addressed recipient and the another recipient are each a subscriber of the service*). APPLE-1005, [0061]-[0063]; APPLE-1053, [0037]-[0038], [0042], [0046], [0062], [0067], FIGs. 2-3 (providing that contacts associated with multiple devices can subscribe to the same services).

4. Claim 13

Element [13]

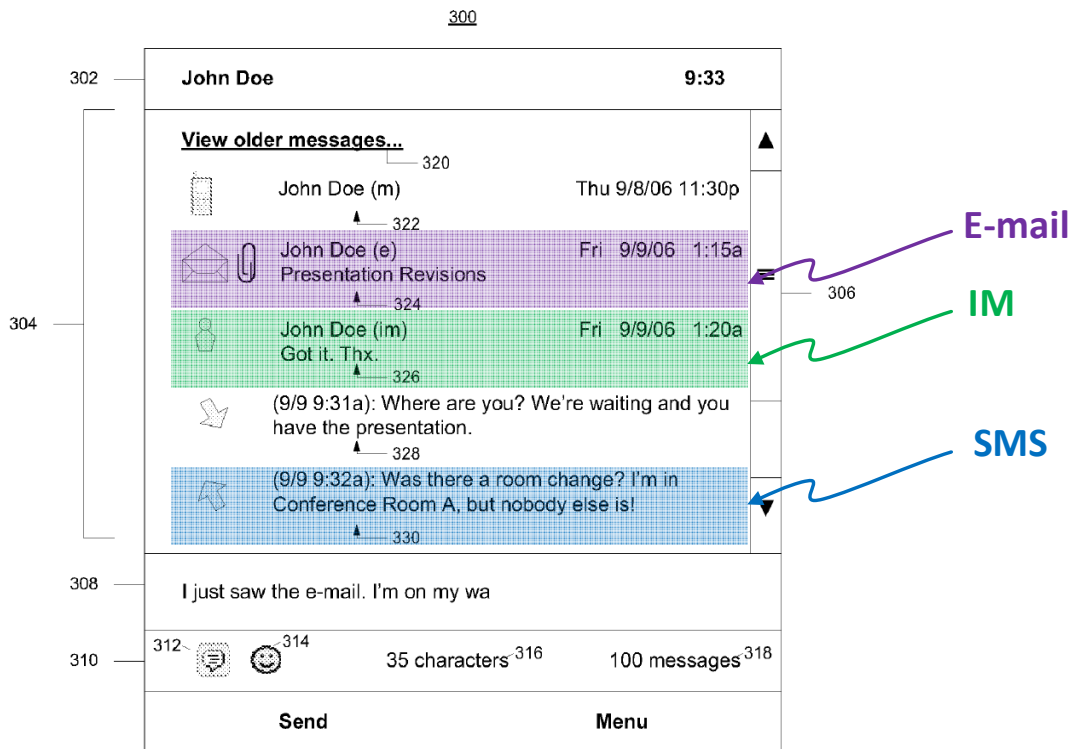
As discussed in Ground 1A with respect to [1a] and [1i]-[1j], *supra*, the combination's sending device 106 uses its WLAN transceiver to transmit at least one message from the mobile to the wireless device of the addressed recipient. *Supra*, Ground 1A at [1a], [1i]-[1j]. Tsampalis and Kansal also each describe transmitting messages to multiple recipients. APPLE-1005, [0035] (“multiple recipient IDs are entered”), [0062] (“multiple remote recipients”), [0063]; APPLE-1053, [0073]-[0078]. A POSITA would have found it obvious that the sending

device 106 would also transmit the same or different messages to the wireless device of another recipient (*e.g.*, another recipient subscribed to the IM service) because each recipient can receive messages and the sender may desire to share information with multiple recipients. APPLE-1003, ¶186.

5. Claim 22

Elements [22pre]-[22b]

As discussed above, the combination implements Kansal's unified messaging UI, which provides a single interface for transmission of and reception of both text messages (*e.g.*, SMS messages) and multimedia messages (*e.g.*, MMS messages, IM messages). APPLE-1053, [0046]; *see also id.*, [0009]; [0045]-[0046]; [0054]-[0056]; [0062]-[0064]; [0070]; [0077]-[0078]. FIGs. 2, 3; *supra*, §IV.B.1(a). For example, message thread 304 "includes a message 326 comprising a sent IM message" and additional messages of various types. APPLE-1053, [0062]-[0064], [0046]; APPLE-1003, ¶187.



APPLE-1053, FIG. 3 (annotated)

Also in the combination, Kansal describes that the messaging UI provides a selectable menu item that provides the option of “Record[ing] Sound” to create a voice recording to attach to a message. APPLE-1053, [0073], FIG. 5; *see also id.*, [0074]-[0078] (“add media”), [0060], FIG. 3 (314). A POSITA would have found it obvious that the voice recording may be played back by the addressed recipient upon receipt of the message to which the voice recording was attached because voice recordings are made to allow earlier utterances to be played back later in time. *Id.*; *see also* APPLE-1005, [0062] (“attached/inserted multimedia files”); APPLE-1003, ¶188.

6. Claim 24

Element [24]

As discussed in Ground 1A with respect to Elements [1i] and [1l]-[1m], *supra*, the combination's sending device 106 selects either a message format that supports multimedia attachments (*e.g.*, MMS or IM) or an SMS format that does not support multimedia attachments (*e.g.*, SMS) based at least in part on the messaging capabilities of the addressed recipient indicated by the response. *Supra*, Ground 1A at [1i], [1l]-[1m]; APPLE-1003, ¶189 (citing APPLE-1007, 7 (describing IM support for "file transfer"); APPLE-1008, [0046]-[0047] (describing transmission of multimedia content via an IM client); APPLE-1053, [0075]-[0077] (describing need to convert SMS to another message type in order to add "media objects such as pictures, video, and/or sounds to a message"))). Further, as discussed in [22], *supra*, the message client of the sending device 106 would implement Kansal's technique for providing an option of "Record[ing] Sound" to create a voice attachment to add to a message that supports multimedia attachments. APPLE-1053, [0073], FIG. 5; *see also id.*, [0074]-[0078] ("add media"), [0060], FIG. 3 (314); *supra*, [22].

In this context, a POSITA would have found it obvious for the message client to provide an option of adding attachment(s) based at least in part on the response because the response informs the selection of a messaging format, and

only a subset of messaging formats support attachments. The option would predictably be provided, for instance, when messaging a recipient for which the response indicates that the recipient is capable of messaging according to a format that supports attachments (*e.g.*, MMS, IM), but the option would not be provided for SMS. For example, Tsampalis teaches that an MMS may include “attached/inserted multimedia files,” which would need to be discarded if the MMS is transformed into an SMS. APPLE-1005, [0062]. Similarly, Kansal describes that, “after a media object has been added to the message, the [unified] messaging UI 500 may undergo an automatic or seamless conversion” from SMS to MMS. APPLE-1053, [0077]. “In the event that the user adds a media object and then removes the media object, the messaging UI 500 may automatically or seamless convert back from an MMS messaging UI to an SMS messaging UI.” *Id.*; *see also* APPLE-1003, ¶190 (citing APPLE-1067, [0060]).

C. GROUND 1C – Horvath-Tsampalis-Tumminaro-Dorenbosch Renders Obvious Claims 2-3, 8, and 28

1. Proposed Combination

(a) Dorenbosch (APPLE-1039)

Dorenbosch proposes two related techniques that (1) help reduce dropped messages and (2) “minimize system connection overhead in a manner that also minimizes the amount of latency introduced into the system,” respectively. *See*

APPLE-1039, [0002], [0005]-[0006], [0020], [0024], [0029]-[0030], [0036],
[0039]-[0040]; APPLE-1003, ¶¶38-41.

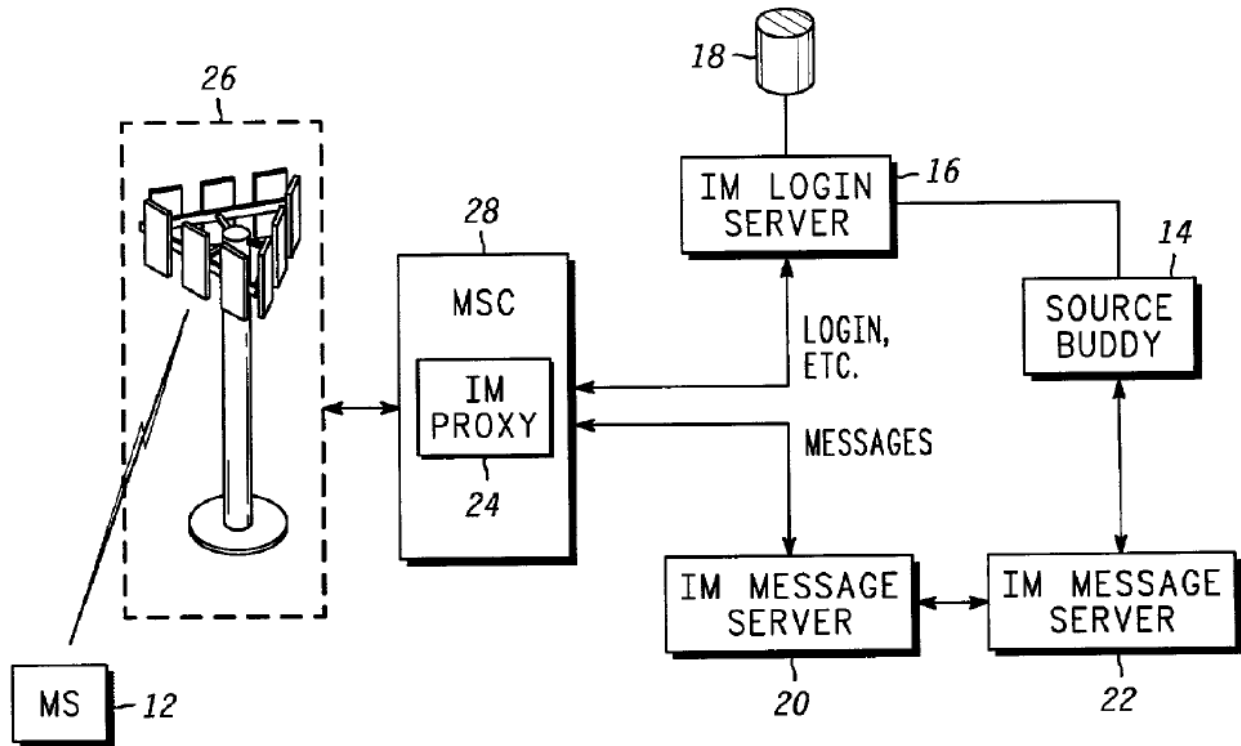


FIG. 1

APPLE-1039, FIG. 1

In one aspect, Dorenbosch describes “an IM session involving [a] mobile subscriber 12 and multiple buddies, such as conventional subscribers 14, 14' and 14", in which [an] IM proxy 24 stores and bundles IMs in its buffer 36 from the conventional subscribers 14, 14' and 14" based on predetermined participant parameters.” APPLE-1039, [0036]. “When the IM proxy 24' determines that download parameters have been met, the IM proxy 24' establishes a connection

with the mobile subscriber 12 and at 122 downloads the stored and bundled messages to the mobile subscriber 12.” APPLE-1039, [0037]. Two examples of download parameters are: (1) when “more than a predetermined number of messages are stored” and (2) “a predetermined buffer memory threshold is exceeded.” APPLE-1039, [0039]-[0040].

In another aspect, if a mobile IM subscriber temporarily loses network coverage and is therefore unavailable to receive messages, the IM proxy will continue to store messages in the message buffer and retry sending the message(s) (*e.g.*, a predetermined number of times within a predetermined time period) before dropping the message(s) from the buffer. APPLE-1039, [0020], [0024].

Dorenbosch describes a retry counter and timer that “enable the IM proxy 24 to maintain its IP connection with the IM login server 16, and therefore maintain the mobile subscriber’s registered status with the IM login server 16, when the mobile subscriber 12 becomes temporarily unavailable due to roaming or the like.”

APPLE-1039, [0020]; *see also id.*, [0024], [0030]. Only after the mobile subscriber “becomes unavailable for receiving instant messages for a period of time that exceeds the number of retries allotted by and programmed into the retry counter and/or the predetermined time period allotted by the timer” will the IM proxy drop “its connection with the IM login server 16” and “indicat[e] to the IM

server 16 that the mobile subscriber 12 is unavailable.” APPLE-1039, [0028]-[0029].

A POSITA would have understood that implementing these two aspects of Dorenbosch’s disclosure together would achieve the benefits of each individually, and when implemented together, Dorenbosch’s IM proxy bundles messages in a message buffer until “more than a predetermined number of messages are stored,” at which point the proxy attempts to forward the bundled messages to the mobile subscriber. APPLE-1039, [0038]-[0040]; APPLE-1003, ¶153.

(b) The Horvath-Tsampalis-Tumminaro-Dorenbosch Combination

Multiple reasons would have prompted a POSITA to apply Dorenbosch’s techniques for IM proxy caching and bundling IM messages to the Horvath-Tsampalis-Tumminaro system of Ground 1A. *Supra*, §IV.A.1.(d). The combination would have made more efficient use of network overhead, maintained presence status for IM subscribers, attempted redelivery of messages that are directed to IM subscribers who lose network coverage, and adjusted recipient IM subscriber presence status when the cached messages cannot be delivered after a number of retries. APPLE-1039, [0020], [0024], [0029], [0030], [0039]-[0040]; APPLE-1004, [0033], APPLE-1065, [0007]; APPLE-1003, ¶¶145-146.

First, a POSITA would have been motivated to apply Dorenbosch's message bundling and delivery retry techniques to the combination to reduce the number of dropped messages when communicating through IM. APPLE-1039, [0005], [0021], [0024], [0026], [0030]. Dorenbosch's IM proxy maintains a consistent connection with the IM server so that it can cache messages and retry delivering them when a mobile device temporarily loses network connection, which "minimizes the occurrence of instant messages intended for the mobile subscriber being dropped." APPLE-1039, [0021], [0024], [0026], [0030]; APPLE-1003, ¶147.

Second, a POSITA would have been motivated to apply Dorenbosch's message-bundling and delivery-retry techniques to the combination to decrease overhead in the wireless system, furthering Horvath's similar goals. *Compare* APPLE-1004, [0004]-[0005] (identifying the need to overcome the problem of "creat[ing] unnecessary overhead" in the wireless system), [0039] *with* APPLE-1039, [0036]-[0038] (describing bundling techniques to "minimize system connection overhead in a manner that also minimizes the amount of latency"); *see also id.*, [0006], [0033], [0036]-[0037]; APPLE-1003, ¶148.

Third, a POSITA would have found obvious that maintaining a connection to the IM system on behalf of the mobile device, *e.g.*, with an IM proxy, would have allowed the "the mobile subscriber [to] continue[] to appear available to IM

buddies when the mobile subscriber is roaming or temporarily out of service even after the IM proxy unsuccessfully attempts to send an instant message to the mobile subscriber,” thereby providing a more pleasing user experience. APPLE-1039, [0030]; APPLE-1003, ¶149.

A POSITA would have reasonably expected success implementing the combination as the messaging and communication protocols involved were all well known before the Critical Date. APPLE-1003, ¶150.

2. Claim 2

Element [2]

As discussed in Ground 1A for [1g]-[1h], *supra*, a POSITA would have found obvious that the response from the HLR 202 and/or HSS 210 containing messaging capabilities information would include information about the services to which the wireless device 106 is subscribed (*e.g.*, IM). Accordingly, where the sending wireless device and the recipient device are both registered with an IM service like that described in each of Horvath, Tumminaro, and Dorenbosch, a POSITA would have further found obvious that the sending device would select to send the message over the packet-switched messaging service (*e.g.*, the IM service) via the IMS core (*server*) using *a packet-switched bearer* (*e.g.*, 8012.11 or GPRS, EV-DO, or UMTS bearers). *Supra*, Ground 1A at [1i]; APPLE-1004, [0033]; APPLE-1039, [0017], [0022] (“communicating with the IM proxy 24, it should be

understood that multiple source buddies (either mobile or conventional subscribers) are capable of communicating with multiple target buddies (either mobile or conventional subscribers) via the functionality implemented at the IM proxy 24”). For example, Tsampalis describes how rich message formats that require a packet-switched bearer, which includes IM in the combination, can be set as the default format for sending a message, and which would be selected if the addressed recipient does not have limited messaging capabilities. APPLE-1005, [0062]-[0064]; *supra*, [1i]; APPLE-1003, ¶151.

As explained in §IV.C.1(b), *supra*, a POSITA would have found it obvious to modify the system of the combination based on the Dorenbosch techniques to enhance communications via the IM service provided by Horvath’s packet-switched network. In the combination, Dorenbosch’s IM proxy—either integrated into the information processing system 108 or implemented as an application server of the IMS system—“functions to set up a connection, such as an IP connection, with the IM login server 16 for the mobile subscriber 12 and for facilitating information flow between the IM login server 16 and the mobile subscriber 12 once the connection is established.” APPLE-1004, [0038]-[0039] (“[a]n IMS system also includes application servers that host and execute services for the wireless device 106”); APPLE-1039, [0019] (“IM proxy 24 is preferably

housed within a mobile services switching center (MSC) 28” or “in proximity to the MSC 28”); APPLE-1003, ¶152.

As explained in §IV.C.1(a), *supra*, the two aspects of Dorenbosch’s IM proxy bundle messages in a message buffer until “more than a predetermined number of messages are stored,” at which point it will attempt to forward the bundled messages to the mobile subscriber (*e.g.*, the combination’s sending and receiving mobile phones). APPLE-1039, [0038]-[0040]. The IM proxy will maintain a connection with the IM login server even when the mobile subscriber temporarily loses network coverage, and other IM subscribers will continue to see the mobile subscriber as having an “available” presence and be able to send the mobile subscriber messages. APPLE-1039, [0024], [0030]. If the IM proxy attempts to forward the bundle of messages to the mobile subscriber and is unable, the IM proxy will retry sending the bundle a certain number of times within a certain period, after which it will drop the message(s) and indicate to the IM login server that the mobile subscriber is unavailable. APPLE-1039, [0020], [0024], [0029]. In other words, when the number of messages cached by the IM proxy reaches the threshold number and the IM proxy tries but fails to send the bundle of messages to the IM subscriber, any sending mobile phones will no longer be able to send the IM subscriber messages, because the IM login server will list the IM subscriber as unavailable. APPLE-1003, ¶153.

Accordingly, a POSITA would have found obvious that, in the Horvath-Tsampalis-Tumminaro-Dorenbosch combination, sending wireless device 106 selects a *packet-switched bearer* for transmission of a message (e.g., an IM message) via the IMS core (*server*) further based upon *a status indicating that an undelivered message parameter has not been exceeded* (e.g., a status indicating that the addressed recipient is available to receive IMs, which is based on the IM proxy being able to continue to receive an acknowledgement that the second receiving mobile phone is receiving bundled messages, where the IM proxy caches IMs for the addressed recipient until a threshold number of messages have been stored, at which point the IM proxy will attempt to deliver the messages to the addressed recipient). APPLE-1003, ¶154.

3. Claim 3

Element [3]

As discussed in Ground 1A with respect to [1l] and [1m], *supra*, a POSITA would have found it obvious that the combination's sending device 106 transmits an SMS message limited to one or more binary-encoded characters to an addressed recipient via a cellular base station through an SMSC before delivery to the addressed recipient based at least in part on the response failing to indicate that the addressed recipient corresponds to a subscriber of a packet-switched messaging service (e.g., the IM service). *Supra*, Ground 1A at [1l]-1m]. A POSITA

considering the teachings of Dorenbosch further would have found it obvious for the combination's sending device to send the same type of SMS message limited to one or more binary-encoded characters to an addressed recipient via a cellular base station through an SMSC before delivery to the addressed recipient even when the response *indicat[es] that the addressed recipient corresponds to a subscriber of the service* if a status of the addressed recipient *indicate[s] that an undelivered message parameter has been exceeded*. APPLE-1003, ¶155.

For example, as discussed in [2], *supra*, when the number of messages cached by the IM proxy in the Horvath-Tsampalis-Tumminaro-Dorenbosch system reaches a threshold number and the IM proxy tries but fails to send the bundle of messages to an IM subscriber, any sending mobile phones will no longer be able to send the IM subscriber messages, because the IM login server will list the IM subscriber as unavailable. *Supra*, [2]. Accordingly, if the addressed recipient were only subscribed to IM and SMS messaging services, but the addressed recipient were unavailable (*a status indicating that an undelivered message parameter has been exceeded*) and the sending device lost data network coverage or was not otherwise currently registered with the IMS, it would have been obvious based on Horvath's, Tsampalis's, and Dorenbosch's teachings to format and transmit the message via a cellular base station using SMS to ensure the message could be successfully delivered to the recipient sooner, rather than waiting for the recipient

to possibly become available later on the IM service. APPLE-1005, [0062]-[0063]; APPLE-1004, [0050], [0077]-[0078], FIG. 7; *supra*, §IV.C.1(a)-(b), [2]; APPLE-1003, ¶156.

4. Claim 8

Element [8]

As discussed in §IV.C.1(b) and [2], *supra*, the IM proxy in the Horvath-Tsampalis-Tumminaro-Dorenbosch combination ***queues a message*** (e.g., an IM) ***to the addressed recipient for later deliver using the service*** (e.g., the IM service) ***if the wireless device of the addressed recipient corresponds to a subscriber of the service*** and, ***at a time of message transmission is unable to connect to the server*** (e.g., the IMS core and application servers that implement aspects of the IM service, which can include IM application servers, IM proxy, IM login system). APPLE-1004, [0047] (“The wireless device 106 may not be registered ... because it never was registered to begin with, because it deregistered, or because it lost its coverage.”), [0045]-[0048], [0075]-[0076], FIG. 6; APPLE-1039, [0020], [0024], [0028]-[0029], [0036]; *supra*, §IV.C.1(a)-(b). Claim [8] was therefore obvious. APPLE-1003, ¶157.

5. Claim 28

Element [28pre]

To the extent the preamble is limiting, the Horvath-Tsampalis-Tumminaro-Dorenbosch combination renders a “***system***” as recited in [28pre]. APPLE-1004, Title (“METHOD AND SYSTEM FOR DELIVERY OF SHORT MESSAGE SERVICE MESSAGES”), Abstract, [0011] (“exemplary wireless communication system”), [0021] (“the system of the present invention”); APPLE-1005, [0001], [0006], FIG. 1; *supra*, Ground 1A at [1pre]; APPLE-1003, ¶158.

Element [28a]

Supra, Ground 1A at [1pre]. APPLE-1003, ¶159.

Element [28b]

Supra, Ground 1A at [1pre], [1n]. APPLE-1003, ¶160.

Element [28c]

Supra, Ground 1A at [1pre]. APPLE-1003, ¶161.

Element [28d]

Supra, Ground 1A at [1a]. APPLE-1003, ¶162.

Element [28e]

Supra, Ground 1A at [1b]. APPLE-1003, ¶163.

Element [28f]

Supra, Ground 1A at [1c]. APPLE-1003, ¶164.

Element [28g]

Supra, Ground 1A at [1d]. APPLE-1003, ¶165.

Element [28h]

Supra, Ground 1A at [1e]. APPLE-1003, ¶166.

Element [28i]

As discussed in [1f], *supra*, the combination's sending device 106 retrieves, from a message, address information in the form of a mobile phone number of a wireless device of an addressed recipient during composition of the message.

Supra, Ground 1A at [1f]. A POSITA would have found it obvious that the retrieved address information consists of "only one" mobile phone number, for example, when the wireless device of the addressed recipient has only one phone number, as was commonly the case by the mid-2000s Critical Date of the '827 Patent (July 24, 2007). APPLE-1003, ¶167.

Element [28j]

Supra, Ground 1A at [1g]. APPLE-1003, ¶168.

Element [28k]

Supra, Ground 1A at [1h]. APPLE-1003, ¶169.

Element [28l]

Supra, Ground 1A at [1i] and Ground 1C at [2]. APPLE-1003, ¶170.

Element [28m]

Supra, Ground 1A at [1j]. APPLE-1003, ¶171.

Element [28n]

Supra, Ground 1A at [1pre]-[1a], [1j]. APPLE-1003, ¶172.

Element [28o]

Supra, Ground 1A at [1k]. APPLE-1003, ¶173.

Element [28p]

Supra, Ground 1A at [1l]. APPLE-1003, ¶174.

Element [28q]

Supra, Ground 1C at [3]; *see also* Ground 1A at [1pre], [1m]; Ground 1C at [2]. APPLE-1003, ¶175.

Element [28r]

Supra, Ground 1C at [8]. APPLE-1003, ¶176.

Element [28s]

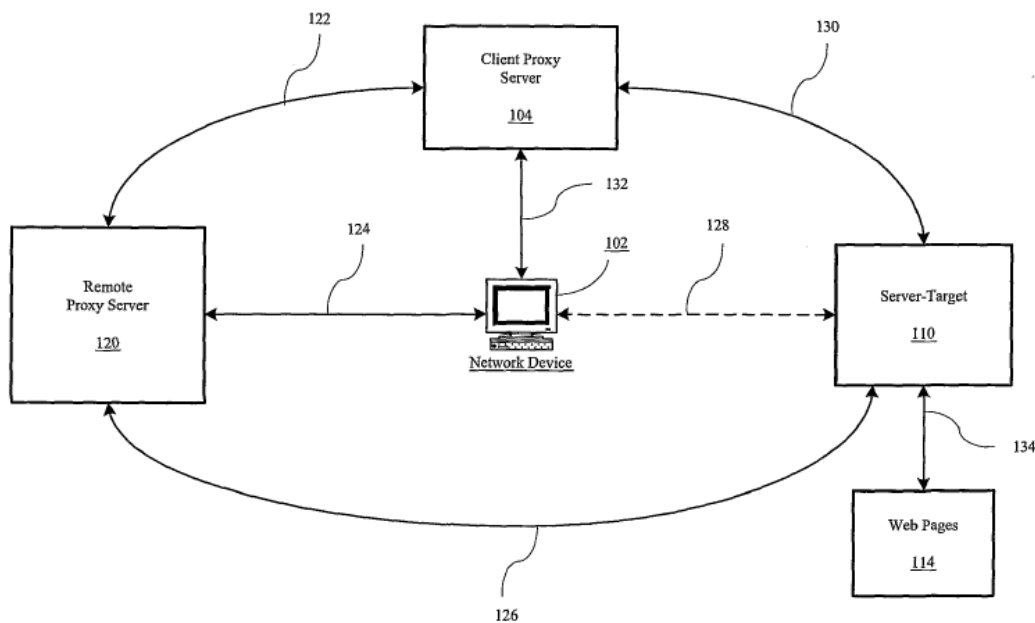
Supra, Ground 1A at [1n]. APPLE-1003, ¶177.

**D. GROUND 1D – Horvath-Tsampalis-Tumminaro-Cottrell
Renders Obvious Claims 4-6**

1. Proposed Combination

(a) Cottrell (APPLE-1040)

Cottrell describes a “secure network privacy system” that enhances security and protects users’ privacy by intercepting and modifying communications between a network device and a target server. APPLE-1040, [002]-[009], [019]-[022], [024], [0051], FIGs. 1-2, 5. APPLE-1003, ¶¶44-45. FIG. 1 is a block diagram representing major components of Cottrell’s system, including a network device 102, a client proxy server 104, and a server-target 110:



APPLE-1040, FIG. 1

Cottrell explains that “the Remote Proxy Server 120 relay[s] data from the client on the Network Device 102 to the Server-Target 110 hosting the content or service the Network Device 102 may be attempting to connect to and/or access.” APPLE-1041, [022]. The Remote Proxy Server intercepts communications

between the network device 102 and Server-Target 110 and performs various privacy-enhancing operations including “adding, changing, or removing text, data, information, scripts, or other content” sent by or directed to the network device 102. *Id.* The Remote Proxy Server can “replace sensitive information like-email addresses or credit card numbers with either false information or alternative information” to shield the sensitive information from the Server-Target. *Id.*, [024]. The substituted information can include “personal information related to the user, such as real name, address, phone number, etc., with alternative information for purposes of identity protection, privacy, and tracking prevention.” *Id.*, [051].

(b) The Horvath-Tsampalis-Tumminaro-Cottrell Combination

A POSITA would have found it obvious to modify the Horvath-Tsampalis-Tumminaro system of Ground 1A further in view of Cottrell to include a remote proxy server that selectively removes or replaces privacy sensitive information in communications between a user device (*e.g.*, Horvath’s sending wireless device 106) and a target server (*e.g.*, Tumminaro’s payment server). *Supra*, §IV.D.1(a). Cottrell describes how the remote proxy server can be implemented in any of a variety network locations or elements including “networked game systems ..., a router, network-address translation device, switch, firewall, or other network device or appliance” between the user device and the target server. APPLE-1040,

[021]. In the context of a system that includes an IMS as in the combination—which already functions as an intermediary that routes information from the sending device 106 to application servers and servers of third-party providers (*e.g.*, Tumminaro’s payment server)—the IMS core or an application server associated with the IM, MMS, or third-party service would have been a natural and obvious location to implement the privacy-protecting functions of Cottrell’s remote proxy server. APPLE-1003, ¶191; *supra*, §IV.A.1.(d).(ii), Ground 1A at [1n].

A POSITA would have been motivated to pursue the combination to better protect the privacy of a user of Horvath’s sending wireless device 106 when messaging with a target server such as the payment server described in Tumminaro or another server. Cottrell explains that the removal or “substitution of personal information related to the user” is beneficial for “identity protection, privacy, and tracking prevention.” APPLE-1040, [051]. A POSITA would have sought to achieve these known benefits in the combination system for the same reasons expressed in Cottrell. Indeed, Cottrell notes it was common for “businesses and certain individuals [to] attempt to identify and track individual Internet users for numerous purposes,” and explains that “[m]any of these attempts are threats to the individual privacy of users ... because they attempt to gain personal information about the user and the user’s activities online ..., often without the user’s consent or knowledge.” APPLE-1040, [006]. Substituting or otherwise removing sensitive

information between the wireless device 106 and a target server would have helped ameliorate these threats. *KSR*, 550 U.S. at 417 (2007); *Intel*, 61 F.4th 1373, 1380-81 (Fed. Cir. 2023); APPLE-1003, ¶192.

A POSITA would have reasonably expected success implementing the combination, especially as the messaging and communication protocols involved were all well known before the Critical Date. APPLE-1003, ¶193.

2. Claim 4

Element [4]

Horvath-Tsampalis-Tumminaro-Cottrell renders Claim [4] obvious. APPLE-1003, ¶194. As discussed in §IV.D.1(b), *supra*, the IMS core or an application server for the MMS, IM, or payment service in the combination system forwards messages sent from the sending wireless device 106 and intended for a third-party provider (*e.g.*, Tumminaro’s mobile payment service) to a server associated with the third-party provider, and in so doing, substitutes or otherwise removes at least one information element (*e.g.*, a phone number of the sending wireless device 106) from the message before it is forwarded as taught in Cottrell. *Supra*, IV.D.1(a)-(b); APPLE-1040, [024] (“replace sensitive information”), [051] (“substitution of personal information related to the user, such as ... phone number”); *see also* APPLE-1060, 6:59-7:5 (“masks the identity of the sender and recipient ... to protect the anonymity of the [] participants”), Abstract, FIGs. 3, 4b;

APPLE-1061, Abstract (“A mobile device identifier (such as an MSISDN) that typically accompanies a mobile device request is replaced with an ‘enriched’ identifier ...”). Accordingly, the forwarded message *is not identical* to the message transmitted by the sending wireless device 106. APPLE-1003, ¶194.

3. Claim 5

Element [5]

Supra, [4]; APPLE-1003, ¶¶194, 195.

4. Claim 6

Element [6]

Supra, [5]; APPLE-1003, ¶¶195, 196.

**E. GROUND 1E – Horvath-Tsampalis-Tumminaro-Lin
Renders Obvious Claims 10 and 14-15**

1. Proposed Combination

(a) Lin (APPLE-1041)

Lin discloses “a method for establishing a real-time session-based IM system or data exchange system between mobile devices over a digital mobile network system that supports data packet-based communications.” APPLE-1041, [0006]. As part of Lin’s method, “[t]he initiating mobile device [] transmits its IP address, including its TCP port number, the user's personal conference number and the user’s PIN (to authenticate the user as the moderator) in an SMS text message

to [a] telephone number of [a] server 420.” *Id.*, [0017], FIG. 4; *see also id.*, Abstract, [0014]-[0016], FIGs.2-3; APPLE-1003, ¶46.

(b) The Horvath-Tsampalis-Tumminaro-Lin Combination

It would have been obvious to further modify the Horvath-Tsampalis-Tumminaro combination described in Ground 1A by integrating Lin’s suggested techniques for establishing IM sessions between mobile devices by sending SMS messages that invite participants to join the IM sessions and that allow devices to authenticate with an IM server. Multiple reasons would have prompted a POSITA to implement this combination. APPLE-1003, ¶197.

First, a POSITA would have implemented Lin’s techniques in the combination to provide a convenient method for mobile devices to readily initiate and join instant messaging sessions—even when the users are not all initially logged into a same IM service. APPLE-1041, [0003], [0006]; APPLE-1003, ¶198.

Second, a POSITA would have implemented Lin’s techniques in the combination because Lin explains that its server-based architecture for mobile IM provides better efficiency than P2P architectures when more than two devices are involved in a dialog. APPLE-1041, [0005]-[0006]; APPLE-1003, ¶199. The server-based architecture and SMS-based invitations also beneficially allow devices to join the IM session from outside a private network. *Id.*

Third, a POSITA would have implemented Lin's techniques in the combination to improve the initiating mobile devices to securely authenticate with a server and be cleared as a moderator for an IM sessions using a commonly available messaging format (SMS), thereby enhancing security and convenience. APPLE-1041, [0017]; APPLE-1003, ¶200.

Fourth, applying Lin's suggested techniques for establishing IM sessions and authenticating with an IM server through SMS messaging in the context of references like Horvath, Tsampalis, and Tumminaro that describe the same types of messaging services to obtain substantially similar results would have been obvious as a matter of law. *KSR*, 550 U.S. at 417 (2007); *Intel*, 61 F.4th 1373, 1380-81 (Fed. Cir. 2023); APPLE-1003, ¶201.

A POSITA would have reasonably expected success implementing the combination as the messaging and communication protocols involved were all well known before the Critical Date. APPLE-1003, ¶202.

2. Claim 10

Element [10]

As an initial matter, it would have been obvious that the combination's sending device 106 would receive a network address of the P-CSCF 206 that it uses to connect to the IMS core (*server associated with the service which forwards the message comprising the message content intended for the third*

party provider). *Supra*, Ground 1A at [1pre], [1n]. For example, Horvath explains that “the wireless device 106 locates its respective P-CSCF 206 via a dynamic host configuration protocol (‘DHCP’). The wireless device 106 is assigned to a specific P-CSCF 206 for the duration of the device’s subscription to the IMS network.”

APPLE-1004, [0036]. As discussed in Ground 1A with respect to Elements [1c]-[1d], *supra*, the sending device 106 establishes a **server connection** with the IMS core (*server*). *Supra*, Ground 1A at [1c]-[1d]. Because device 106 is a “wireless” device, it would have been obvious to a POSITA for the sending device 106 to receive the network address and any necessary information for connecting to the IMS core (*at least one parameter*) wirelessly over the air (OTA), and therefore in an **OTA configuration message**. Indeed, OTA configuration messages were well known before the alleged invention. APPLE-1003, ¶203 (citing APPLE-1013, 10:8-11; APPLE-1032, [0023], supported by APPLE-1033, page 3, lines 19-26)); APPLE-1004, [0004], [0039] (“air interface”).

Further, based on Lin’s teachings, to initiate or join an IM session, the sending device 106 in the combination would be configured to receive “through an offline process (*e.g.*, email, phone call, letter, etc.), ... a phone number associated with the server (*e.g.*, a toll-free number), a personal conference number, and a PIN.” APPLE-1041, [0018]-[0019], FIG. 4. The server’s phone number is a “unique identification number...that may be used by the mobile devices to contact

the server through the page-mode messaging service (*e.g.*, SMS).” *Id.*, [0018].

When the sending device 106 receives the server’s unique identification number by a phone call or other over-the-air (OTA) process (*e.g.*, SMS, mobile email), it receives an ***OTA configuration message*** that includes at least one parameter (*e.g.*, the unique identification number of the server) for establishing a server connection with the server. APPLE-1003, ¶204.

3. Claim 14

Element [14]

As discussed above, based on Lin’s teachings, the combination’s sending device 106 initiates an IM session by transmitting an SMS message for authentication to an IM service such that the first mobile wireless device is authenticated to the IM service via SMS. APPLE-1041, [0017] (“The initiating mobile device [] transmits its IP address, including its TCP port number, the user’s personal conference number and the user’s PIN (to authenticate the user as the moderator) in an SMS text message to [a] telephone number of [a] server 420.”); *see also id.*, Abstract, [0014]-[0016], FIG. 4; *supra*, §§IV.E.1(a)-(b); APPLE-1003, ¶205.

4. Claim 15

Elements [15pre]-[15c]

Supra, [14] and Ground 1A at Claim [11]. APPLE-1003, ¶206.

V. CONCLUSION AND FEES

The Challenged Claims are unpatentable. Petitioner respectfully requests institution of IPR and cancellation of all Challenged Claims.

Petitioner authorizes the Patent and Trademark Office to charge any fees to Deposit Account No. 06-1050.

VI. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Apple Inc. is the petitioner and the real party-in-interest.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

Petitioner is not aware of any disclaimers, reexamination certificates or petitions for *inter partes* review for the '827 Patent. The '827 Patent is the subject of a civil action in *HBCU Messaging US LP v. Apple, Inc. et al.*, 1-24-cv-01199 (WDTX), filed October 7, 2024.

Petitioner has filed pending petitions for *inter partes* review on the following patents that share a priority relationship with the '827 Patent and that have also been asserted in the WDTX action: IPR2025-01493 (U.S. Patent 11,089,450), IPR2025-01488 (U.S. Patent 11,653,182), IPR2025-01486 (U.S. Patent 8,918,127), IPR2026-00107 (U.S. Patent 11,991,601), IPR2026-00105 (U.S. Patent 11,991,600), IPR2026-00104 (U.S. Patent 11,653,183).

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR50095-0266IP1@fr.com.

Respectfully submitted,

Dated: November 4, 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 Petition for *Inter Partes* Review totals 21,656 words. Apple is appending this Petition to a Motion to Waive the Word Limit pursuant to 37 C.F.R. § 42.24(a)(2).

Dated: November 4, 2025

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on November 4, 2025, a complete and entire copy of this Petition for *Inter partes* Review, Power of Attorney, and all supporting exhibits were provided via Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

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