IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, VERIZON CORPORATE SERVICES GROUP INC.,
T-MOBILE USA, INC.,
AND AT&T SERVICES, INC.,
Petitioners,

v.

HEADWATER RESEARCH LLC
Patent Owner.

U.S. Patent No. 8,924,543
Issue Date: December 30, 2014
Title: SERVICE DESIGN CENTER FOR DEVICE ASSISTED SERVICE

Inter Partes Review No.: IPR2024-01042

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,924,543 UNDER 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-.80, 42.100-.107

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TABLE OF CONTENTS

Page

I. INTRODUCTION 1

II. OVERVIEW 1

III. GROUNDS FOR STANDING (37 C.F.R. § 42.104(A)) 5

IV. REASONS FOR THE REQUESTED RELIEF 6

A. Summary of the ’543 Patent 6

B. Prosecution History 10

C. Claim Construction 11

D. Priority Date of the Challenged Claims 11

E. Person of Ordinary Skill in the Art 11

F. State of the Art 12

1. Network Service Plan Provisioning Systems 12

2. Policy Transformation and Translation 15

3. Rules and Rule Priority 17

V. IDENTIFICATION OF CHALLENGES 18

A. Challenged Claims 18

B. Statutory Grounds for Challenges 18

VI. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE 19

A. Challenge 1: 19

1. Poh 19

2. Maes 27

3. Motivation To Modify Poh With The Teaching Of Maes.....31

4. Detailed Application of Poh and Maes to the Challenged Claims 34

Claim 1 34

Claim 8 49

Claim 9 50

Claim 10 50

Claim 15 51

Claim 21 52

Claim 28 54

Claim 42 55

Claim 43 55

Claim 45 56

Claim 46 56

Claim 87 56

Claim 88 57

Claim 89 57

Claim 96 57

Claim 98 58

Claim 99 59

Claim 120 59

Claim 121 60

B. Challenge 2: 60

1. Burnett 60

2. Motivation To Combine Poh, Maes and Burnett. 61

3. Detailed Application of Poh, Maes, and Burnett to the Challenged Claims 62

Claim 16 62

Claim 44 64

Claim 47 65

Claim 57 67

Claim 58 68

Claim 59 68

Claim 60 69

Claim 61 70

Claim 62 70

Claim 63 70

Claim 64 71

Claim 65 71

Claim 66 71

Claim 68 71

Claim 69 72

Claim 70 72

Claim 71 72

Claim 72 72

Claim 80 73

Claim 85 73

Claim 86 73

VII. THE BOARD SHOULD NOT EXERCISE ITS DISCRETION AND DENY INSTITUTION 74

A. The Board Should Not Deny Institution Under 35 U.S.C. § 325 74

B. The Board Should Not Deny Institution Under 35 U.S.C.§ 314(a) 74

VIII. Mandatory Notices Under 37 C.F.R. §42.8 77

A. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1)) 77

B. Related Matters (37 C.F.R. § 42.8(b)(2)) 78

1. Judicial Matters 78

2. Related Patents 78

C. Lead/Back-up Counsel (37 C.F.R. § 42.8(b)(3)): 78

D. Notice of Service Information (37 C.F.R. § 42.8(b)(4)): 79

IX. Conclusion 79

TABLE OF AUTHORITIES

PAGE(S)

CASES

Paice LLC v. Ford Motor Co., 881 F.3d 894 (Fed. Cir. 2018).....29

PEAG LLC v. Varta Microbattery GMBH, IPR2020-01214, Paper 8 at 17 (Jan. 6, 2021).....75

Sand Revolution II LLC v. Continental Intermodal Group-Trucking LLC, IPR2019-01393, Paper 24 (PTAB June 16, 2020).....76

Sotera Wireless, Inc. v. Masimo Corp., IPR2020-01019, Paper 12 (Dec. 1, 2020) 74

Petitioners' Exhibit List

Exhibit #	*Description*
1001	U.S. Patent No. 8,924,543 ("the '543 Patent")
1002	Select portions of prosecution history of the '543 Patent ("File History")
1003	Declaration of Petitioners' Expert ("Houh Declaration")
1004	U.S. Pat. No. 9,712,331 ("Poh")
1005	U.S. Pat. Pub. No. 2008/0181208 ("Maes")
1006	Boutaba and Polyrakis, "Toward Extensible Policy Enforcement Points", in M. Sloman, J. Lobo, and E. Lupu (Eds.): POLICY 2001, LNCS 1995, pp. 247-261 (© Springer-Verlag Berlin Heidelbergm 2001)
1007	Beigi et al., "Policy Transformation Techniques in Policy-based Systems Management", Proceedings Fifth IEEE International Workshop on Policies for Distributed Systems and Networks (2004)
1008	Chaouchi et al., "Policy Based Networking in Integration Effort of 4G Networks and Services", 2004 IEEE 59th Vehicular Technology Conference, VTC 2004-Spring, pp. 2977-2981 Vol. 5.
1009	Verma et al., "Simplifying Network Administration Using Policy-Based Management", IEEE Network, pp. 20-26 (March/April 20).
1010	3GPP TS 23.203 (v8.4.0 (2008-12) (3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and charging control architecture (Release 8))
1011	U.S. Pat. No. 8,032,920 ("Maes II")
1012	U.S. Pat. No. 9,691,082 ("Burnett")
1013	List of related patents
1014	Plaintiff Headwater Research LLC's Disclosure of Asserted Claims and Infringement Contentions, case no. 2:23-cv-00398, -397.

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311 *et seq*. and 37 C.F.R. §§ 42.1 *et seq*., Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group Inc., T-Mobile USA, Inc., and AT&T Services, Inc., (collectively, "Petitioners") hereby petitions for an *inter partes* review ("IPR") of U.S. Patent No. 8,924,543 ("the '543 Patent"). Petitioners respectfully submit that Claims 1, 8-10, 15, 21, 28, 42-47, 87-89, 96, 98-99, 120-121 (the "Challenged Claims") of the '543 Patent are unpatentable under 35 U.S.C. §103 in view of the prior art herein. This Petition demonstrates that there is a reasonable likelihood that Petitioners will prevail with respect to at least one of these claims. Accordingly, Petitioners respectfully request that the Board institute IPR.[1]

II. OVERVIEW

The Challenged Claims are unpatentable as obvious over the prior art. The claims are directed to a prior art network service plan provisioning system for

[1] Petitioners file contemporaneously IPR2024-01041 that challenges other claims from the '543 patent ("Companion Petition"). Except for the analysis of the dependent claims, the analysis between the Companion Petition and herein is substantively identical.

provisioning network traffic inspection and enforcement systems with rules that implement policies applicable to a wireless end user device. The network service plan provisioning system is shown in FIG. 1 of the '543 Patent:

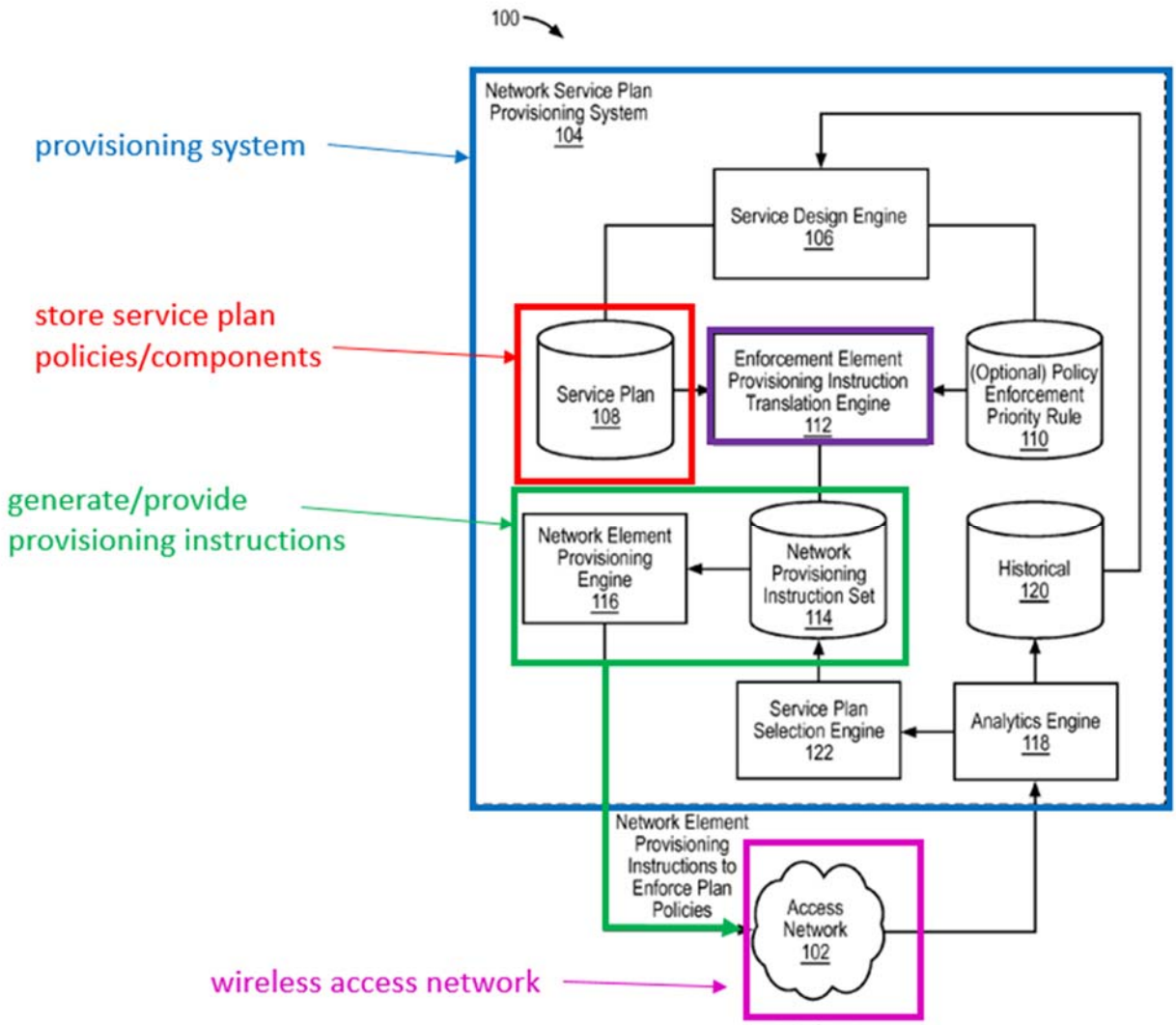


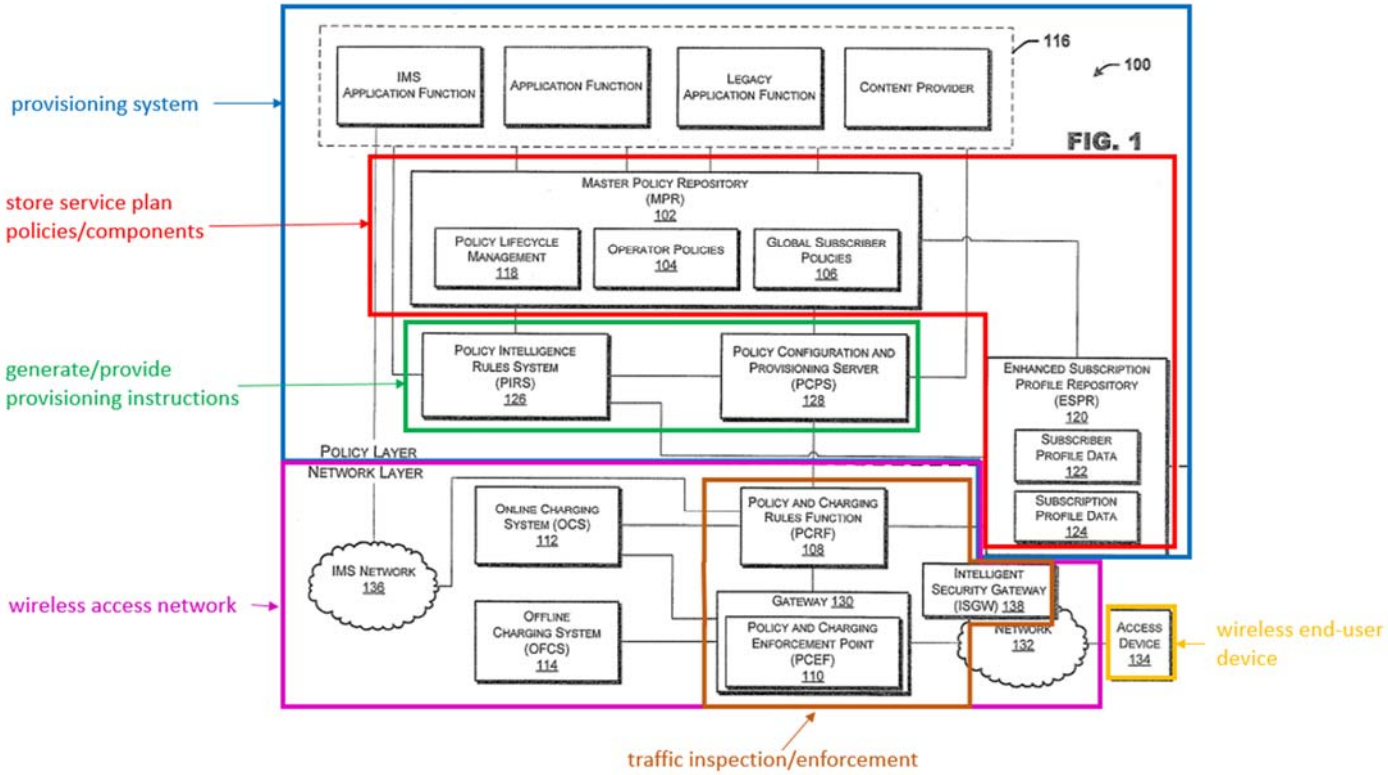
FIG. 1

The Network Service Plan Provisioning System (blue) obtains and stores first and second service plan components in a Service Plan datastore (red). Each service plan component includes (i) a traffic classification filter for filtering a

traffic event and (ii) an enforcement action that is triggered when a traffic event matches the traffic classification filter (i.e., a rule with a match criteria and an action). The provisioning system processes the first and second service plan components using Enforcement Element Provisioning Instruction Translation Engine (purple) to create network provisioning instructions that are stored in Network Provisioning Instruction Set datastore (green). The provisioning instructions (green) are provided via Network Element Provisioning Engine to a network traffic inspection system and network policy enforcement system (not shown) in a wireless access network (pink) that services wireless end user devices (not shown).

The processing of the first and second service plan components to create network provisioning instructions is done in accordance with a "prioritization" of a first traffic classification filter (of a first service plan component) over a second traffic classification filter (of a second service plan component). The '543 Patent discloses that this prioritization of the first traffic classification filter over the second traffic classification filter can be accomplished in several different ways, including simply ordering the first and second traffic classification filters such that the first traffic classification filter is applied to a traffic event before the second traffic classification filter, which the patent refers to as "implicit" priority. EX1001, 11:14-35.

The Poh reference is a parallel disclosure to the ’543 Patent—disclosing the same provisioning system architecture and approach as the ’543 Patent, but it uses different language. Poh’s FIG. 1 discloses that architecture, using color coding to identify components in common with the ’543 Patent:



The policy realization framework is divided into two logical layers, a policy layer (blue) and a network layer (pink). The policy layer obtains and stores policies (e.g., Operator Policies and Global Subscriber Policies) in a Master Policy Repository (red). The provisioning system processes the policies using Policy Intelligence Rules System (green) to translate policies into executable instructions, which are sent from Policy Configuration and Provisioning Server (green) for use

by network elements such as Policy and Charging Rules Function (PCRF), Policy and Charging Enforcement Point (PCEF) of Gateway and/or Intelligent Security Gateway (ISGW) (brown) for inspection and enforcement of the rules in a wireless access network (pink) servicing wireless end user devices (gold). More specifically, the Policy Intelligence Rules System (i) takes operator policies and global subscriber policies from the Master Policy Repository, and subscriber profile data and subscription profile data from the ESPR, (ii) identifies policy conflicts and resolves conflicts (a form of prioritization), and (iii) determines applicable rules to be sent to Policy Configuration and Provisioning Server (PCPS), which sends those rules (as executable instructions) to configure the network layer for rule decision and enforcement operations.

While Poh does not provide the specific details of the filtering performed by rules or the specific prioritization and enforcement mechanisms used by Poh, the Maes reference describes these details. Thus, the Challenged Claims are unpatentable over the combination of Poh and Maes. EX-1003 ¶¶115-181, 231-316.

III. GROUNDS FOR STANDING (37 C.F.R. § 42.104(A))

Petitioners certify that the Patent for which review is sought is available for *inter partes* review and that Petitioners are not barred or estopped from requesting

inter partes review of the Challenged Claims on the grounds identified herein. 37 C.F.R. § 42.104(a). This Petition is filed pursuant to 37 C.F.R. § 42.106(a).

IV. REASONS FOR THE REQUESTED RELIEF

As explained in §§ II and VI-VIII of this Petition and in the attached Declaration of Petitioners' Expert, Dr. Henry Houh ("Houh Declaration"), EX-1003, the systems and methods of provisioning network service plans, as described and claimed in the '543 Patent, were obvious over the prior art to a person of ordinary skill in the art ("POSA") at the time of the invention.

A. Summary of the '543 Patent

The '543 Patent describes a network service plan provisioning system 104 and methods that provide network element provisioning instructions to an access network 102 to enforce plan policies from the network service plan provisioning system 104. EX-1001 8:1-43; FIG. 1.

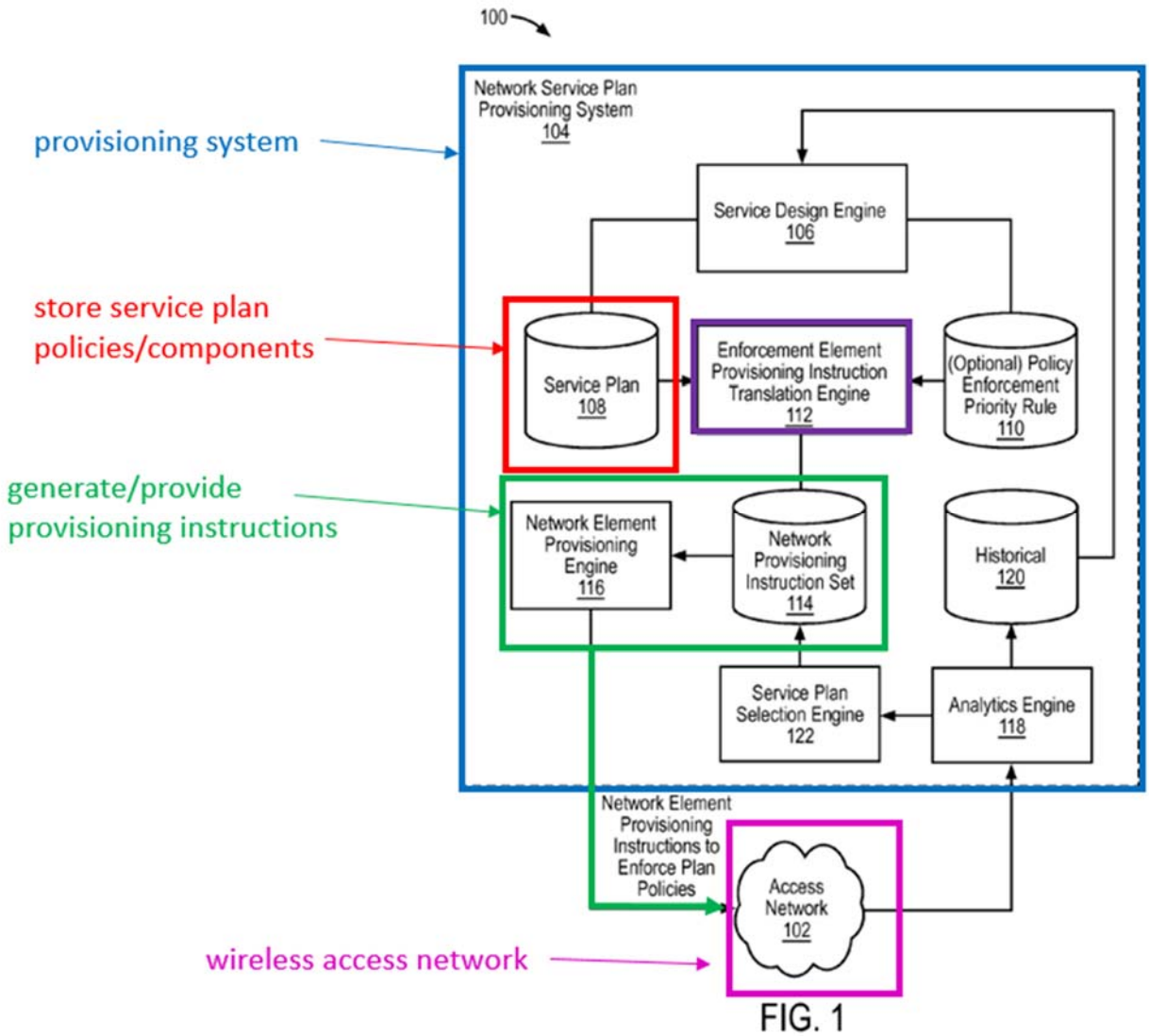


FIG. 1

EX-1001 FIG. 1.

The access network (pink) provides network services to a device and can include a wireless and/or wired network. EX-1001 8:47-52. End user devices include mobile phones, tablet computers or notebook computers. Users sign up for services plans, such as text messages, voice or data, for obtaining services from the access network. The access network uses policies associated with service plans for

governing use of and charging for use of the access network. *Id.* 7:38-66. Policies can include inter-network policies, e.g., traffic control, charging, and notification policies that remain in effect after a device passes from one network to another (e.g., by roaming). Policies also include intra-network policies, which apply to traffic within the boundaries of a network (e.g., in-network traffic control, charging, and/or notification policies, plus an optional traffic control policy that permits or prevents roaming to another network). EX-1001 8:59-67.

As shown in FIG. 1, the network service plan provisioning system 104 includes a service design engine 106, service plan datastore 108, optional policy enforcement priority rule datastore 110, enforcement element provisioning instruction translation engine 112, network provisioning instruction set 114, network element provisioning engine 116, analytics engine 118, historical datastore 120 and service plan selection engine 122. EX-1001 9:37-44.

The service design engine 106 inputs service plan data structures and other related data into the service plan datastore 108. EX-1001, 9:45-47. In a specific implementation, the service design engine 106 also inputs policy enforcement priority rule data structures in the policy enforcement priority rule datastore 110. An aspect of policy control entails the superposition of a first traffic classification filter of a service plan over a second traffic classification filter of the service plan, for example by: (i) ordering the first and second traffic classification filters such

that the first traffic classification filter is applied to a traffic event before the second traffic classification filter; (ii) trapping a match of the first traffic classification filter in a kernel until the second traffic classification filter is matched (then applying a first relevant action of an action list); or (iii) applying an explicit policy enforcement priority rule. According to the '543 Patent, because implicit policy enforcement priorities can be used, the policy enforcement priority rule datastore 110 is optional. Alternatively, explicit policy enforcement priorities can be mandated or a combination of implicit and explicit policy enforcement priorities can be used. EX-1001, 11:14-34. Policy priority can be reflected in a field associated with a policy. EX-1001, 23:40-45.

The enforcement element provisioning instruction translation engine 112 converts service plan data structures from the service plan datastore 108 into respective network provisioning instruction set data structures, which are stored in the network provisioning instruction set datastore 114. The translation engine 112 can also convert the relevant policy enforcement priority rule data structures from the policy enforcement priority rule datastore 110, if applicable, for inclusion in the network provisioning instruction set data structures. EX-1001, 11:36-45.

The network element provisioning engine 116 provides network element provisioning instructions to enforce plan policies to the access network 102. The network element provisioning instructions are applicable to one or more devices

that may or may not currently be on the access network 102. In one implementation, the network element provisioning instructions are sent to the access network 102 only when the applicable devices are on the access network 102. EX-1001, 11:46-54.

FIG. 5 illustrates a method of creating a service plan component including one or more filters and policy event rule records having one or more policy rules. EX-1001, FIG. 5, 20:22-43. Policy rules include a filter event and an enforcement action. For example, a policy event rule becomes applicable when a filter matches a traffic instance including a traffic event in a way specified by the rule. By way of example, traffic events can include a specified remote destination (e.g., a domain or IP address), a specified application (identified by, e.g., name, hash, certificate, signature, other secure ID, etc.), a specified operating system, specified content, a specified protocol (e.g., TCP, UDP, TCP/UDP), or a specified port number. EX-1001, 20:44-55. Policy rules can define actions upon matching (or no matching) of a filter event, for example, allow, block, throttle, delay, defer, or take no action. EX-1001, 21:27-48. Rules can also define notifications to be issued and charges to apply. EX-1001, 21:49-22:24.

B. Prosecution History

The ’543 Patent issued from application number 13/248,025 filed on September 28, 2011 and claimed priority to over 400 applications. The application

received a first Office Action restriction requirement. The Applicant traversed the restriction requirement and added 95 new claims. EX-1002, 000113-000140. The examiner then issued a notice of allowance for all 121 claims without applying or discussing any prior art. EX-1002, 000101-000108.

C. Claim Construction

For purposes of this Petition solely, Petitioners propose that each claim term in the Challenged Claims be given its plain and ordinary meaning in this proceeding, and that no specific construction of any claim term is required because the prior art relied on in this Petition meets each of the claim terms under any reasonable construction.

D. Priority Date of the Challenged Claims

The ’543 Patent claims priority to a large family of over 400 applications, the earliest of which is dated January 29, 2009. The prior art cited herein predates the earliest possible priority date.

E. Person of Ordinary Skill in the Art

With respect to the ’543 Patent, a POSA in the January 2009 timeframe would have been familiar with designing rules for implementing policies for service plans for use of an access network and provisioning those rules to network elements for policy enforcement, as demonstrated by the prior art references and description in the State of the Art below. EX-1003 ¶45.

A POSA would have gained knowledge of these concepts through a mixture of training and work experience, such as by having a Bachelor's degree in computer science and two years of experience; or by obtaining a Master's degree in computer science, but having only one year of experience; or by having no formal education but experience in network service plan provisioning systems of at least four years. EX-1003 ¶46.

F. State of the Art

The following section describes the state of the art for network service plan provisioning systems as of January 2009. The prior art references, and the discussions of what was known to a POSA, provide general description of the state of the art and additional motivation to modify or combine the reference(s). Accordingly, these references should be considered by the Board.

1. Network Service Plan Provisioning Systems

Using network based policies to configure network devices is known as Policy-Based Networking (PBN). Prior to PBN, configuring network devices, such as routers, switches and other network elements, involved an administrator configuring each device independently. Later, other technologies attempted to automate the process such as using the Simple Network Management Protocol (SNMP). EX-1006 pp. 247-248. EX-1003, ¶98.

PBN uses control/management policies, i.e., the rules that govern the network behavior. The administrator edits policies in a management tool that performs syntax, semantics and basic conflicts checking. These policies are then distributed to special policy servers called Policy Decision Points (PDPs). The PDPs process the policies, along with other data such as network state information, and take policy decisions about what policies should be enforced and how enforcement will happen. The policies are sent as configuration data to the appropriate Policy Enforcement Points (PEPs), which reside on management devices (e.g., routers, switches, gateways, etc.) and are responsible for installing the policies and enforcing them. EX-1006 p. 248; EX-1007 p. 14.; EX-1008 p. 2978; EX-1009 pp. 20-21; EX-1010 p. 16. EX-1003, ¶99. Below is a diagram of a known PBN basic schema:

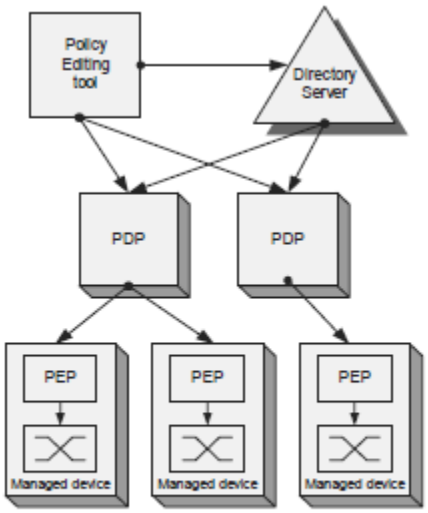


Figure 1. The Policy-Based Networking basic schema

EX-1006 p. 248.

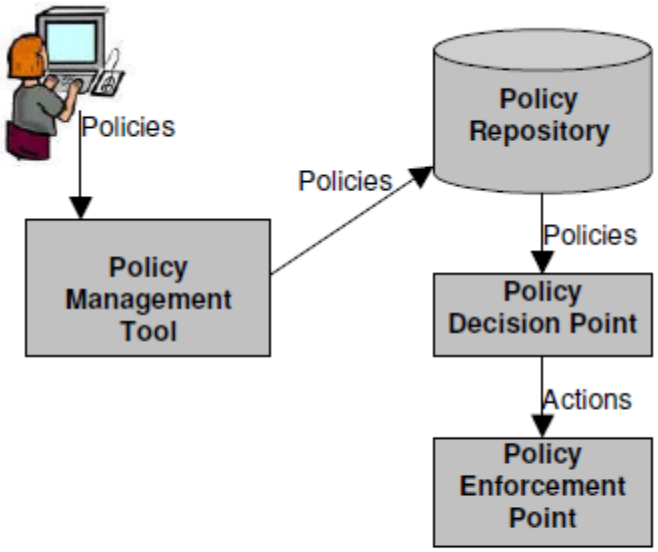


Figure 1. A general policy based systems management architecture

EX-1007 p. 14.

PBN contemplated two models of operation—outsourcing and provisioning. In the outsourcing model, when the PEP receives a network event that it does not know how to handle, it sends a request to the PDP and the PDP responds by sending the configuration data that must be installed to respond to the event. In the provisioning model, the PDP sends the policies that must be enforced when the PEP connects to the PDP. EX-1006 p. 248; EX-1009 p. 20-21.

PBN architectures such as shown above have been proposed by the Internet Engineering Task Force (IETF) and adopted in cellular systems, such as those governed by the 3GPP standards. EX-1008 p. 2977; EX-1010 § 5.1 (Reference Architecture). For example, in 3GPP Release 8 (and earlier releases), the Policy

and Charging Rules Function (PCRF) provides the role of the PDP and the Policy Charging and Enforcement Function (PCEF) provides the role of the PEP:

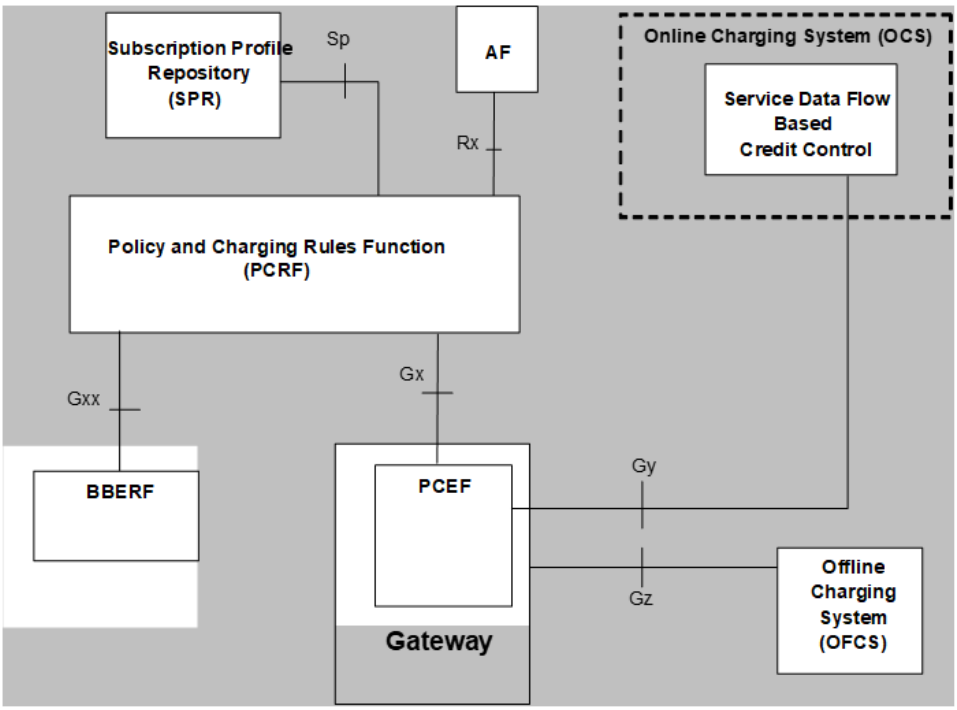


Figure 5.1.1: Overall PCC logical architecture (non-roaming)

EX-1010 p. 16. In the architecture above, rules could be predefined or dynamically provisioned at establishment and during the lifetime of a session, such as through the Gx reference point above. EX-1010 pp. 12, 19-20, 26, 45. EX-1003, ¶¶100-106.

2. Policy Transformation and Translation

Generally, it was known that a policy management tool can take policies entered by an administrator and convert them to a form that can be deployed and interpreted by PEPs. EX-1007 p. 13; EX-1008 p. 2978 ("A policy management tool is often used to ensure the automatic translation of the policies from the high

or business level to the low or network level policies."); EX-1009 p. 21, 22. The transformation may be performed at the PEP. EX-1007 p. 13. EX-1003, ¶¶107-110.

FIG. 2 below shows a policy-based management architecture incorporating policy transformation in the policy management tool. EX-1007 pp. 14-15:

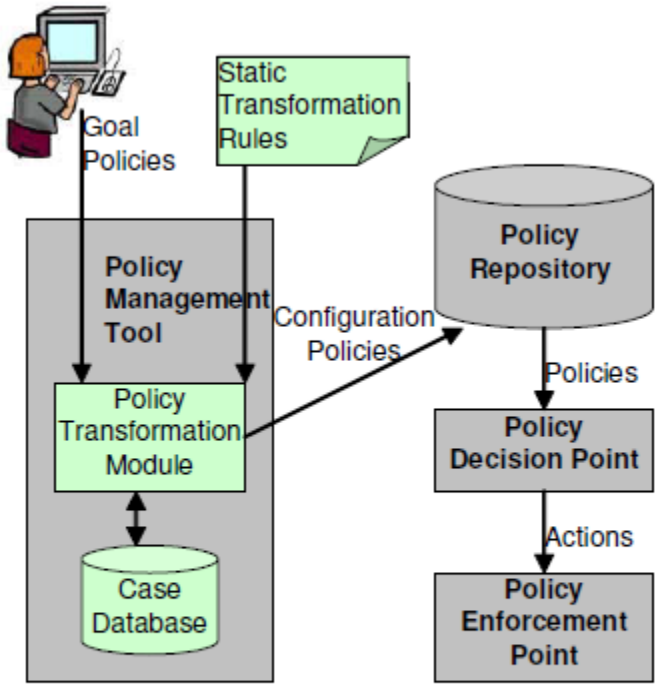


Figure 2. A policy based systems management architecture enabled with static policy transformation

EX-1007 p. 13.

In real time policy transformation, the policy-based management system uses an online component that dynamically monitors the behavior of network elements in order to ensure that the specified policy objectives are being met.

System behavior is used by the transformation module to dynamically modify the configuration of the system to achieve the policy goals. EX-1007 p. 15.

3. Rules and Rule Priority

It was known that policies that are enforced by PEPs included rules that typically include: (1) matching (i.e., filtering) criteria for identifying packets and data flows; and (2) actions. These rules are determined by the operator based on, for example, user subscription information. Matching criteria may include 5-tuple information (i.e., source IP address, destination IP address, source port number, destination port number, and protocol ID) of incoming packets. If an IP packet, for example, matches filtering criteria, then the PEP takes the decision or action that the policy specifies. Actions may include, for example, allow or deny packets, guarantee a certain quality of service (QoS) level, perform reporting, performing charging functions, etc. EX-1006 p. 253; EX-1010, §§ 4.1 (General Requirements), 4.2 (Charging Requirements), 4.3 (Policy Control Requirements), 6.2.2 (Policy and Charging Enforcement Function (PCEF)), 6.3 (Policy and Charging Control Rule), 6.5 (Quality of Service Control Rule). EX-1003, ¶111.

It was also known to assign rules and policies a priority, and rules and policies were evaluated according to their priority. In some cases, in the event of conflicts between policies, the order of the policies determined the priority. EX-1006 p. 253; EX-1009 pp. 22-23; EX-1010 p. 48. EX-1003, ¶112.

One form of policy validation performed as part of policy transformation was conflict resolution. For example, in a policy with multiple rules, individual rules may be perfectly acceptable by themselves, but there is a conflict when any two rules are taken together. If a conflict is found, one way the conflict can be resolved is to assign the rules different priorities. Since priority can be considered an independent term for conflict resolution (i.e., beyond other triggering criteria and actions specified in the rules), policies and rules with different priorities did not overlap and thus did not cause conflicts. EX-1009 pp. 22-23. EX-1003, ¶113.

V. IDENTIFICATION OF CHALLENGES

A. Challenged Claims

Claims 1, 8-10, 15, 21, 28, 42-47, 87-89, 96, 98-99, 120-121 of the '543 Patent are challenged.

B. Statutory Grounds for Challenges

The Challenges are set forth in detail below and summarized as follows:

Ground	Claims	Basis	Reference
1	1, 8-10, 15, 21, 28, 42-43, 45-46, 87-89, 96, 98-99, 120-121	§ 103	Poh, alone, or in view of Maes
2	16, 44, 47, 57-66, 68-72, 80 and 85-86	§ 103	Poh, alone, or in view of Maes, in further view of Burnett

Ground 1:

U.S. Patent 9,712,331 ("Poh") issued on July 18, 2017 from an application filed on August 20, 2008 (EX-1004). Poh is prior art under §102(a)(e).

U.S. Patent Pub No. 2008/0181208 ("Maes") published on July 31, 2008 from an application filed on January 30, 2007 (EX-1005). Maes is prior art under §102(a)(e).

Ground 2:

U.S. Patent 9,691,082 ("Burnett") issued on June 27, 2017 from an application filed on March 19, 2008 (EX-1012). Burnett is prior art under §102(a)(e).

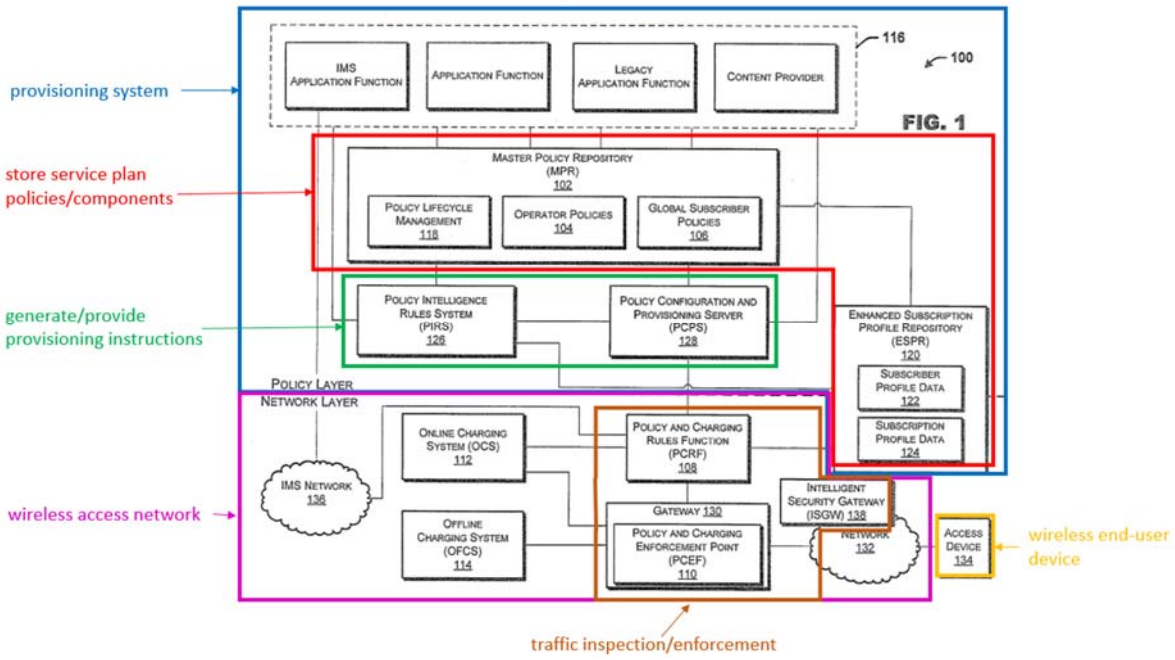
VI. IDENTIFICATION OF HOW THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Challenge 1:

1. Poh

(a) Provisioning Architecture

Like the '543 Patent, Poh teaches a policy configuration and provisioning system for a communication network. Poh's FIG. 1 discloses a policy realization framework reflecting the architecture:



EX-1004, 3:7-46, 10:22-25, 10:28-30, 16:4-14, FIGS. 1, 3. EX-1003, ¶¶57-59.

Poh's policy realization framework is divided into two logical layers, a policy layer (blue) and a network layer (pink). The policy layer handles policy management, rule generation for implementing policies and provisioning of the network layer with generated rules:

> [T]he policy layer includes application and service policy management systems and network policy management systems. The policy layer can store, organize, determine, and apply policy rules to services requested by subscribers or other entities, as will be explained in more detail below. The policy layer can provide common policy rules across services and applications, and policy rule management. The policy layer can dynamically determine rules based upon operator policies,

> network policies, subscriber specific policies, subscription specific policies, subscriber profile data, subscription profile data, and/or subscriber preferences, for example. The policy layer can also generate instructions or commands for driving elements in the network layer to grant, restrict, and/or deny requested services. Rules can be determined online, i.e., during a service or application session, and in real-time or near real-time. Additionally, or alternatively, the policy rules can be determined offline, i.e., not during a service or application session.

EX-1004, 11:9-33.

Poh's policy layer includes a Master Policy Repository (MPR) (red) that receives, retrieves, accesses, organizes, and/or manages operator policies and global subscriber policies. Operator policies include policies for gating control, data throttling, packet inspection, security, privacy, emergency, charging, application-specific, global application, service-specific, global service, content provider, legacy, and the like. Policies are enforced in the network layer by a policy and charging rules function (PCRF) (brown), a policy and charging enforcement point (PCEF) (brown), a wireless application protocol (WAP) gateway (not shown), deep packet inspection (DPI) points (not shown), and/or other enforcement points that require service rules to ensure consistent enforcement by the network. EX-1004, 11:53-12:8; EX-1003, ¶¶60-62.

Global subscriber policies include policies global to all subscribers and applied to one or more applications / services that are accessible to the operator's subscribers. Global subscriber policies can be defined for each service or application, such as a service aware roaming control policy that can prevent a subscriber from accessing operator-defined services or applications while roaming. EX-1004, 12:23-31; EX-1003, ¶63.

Poh's MPR is fed by an Enhanced Subscription Profile Repository (ESPR) (red) that stores subscriber and subscription profile data. Data stored in the ESPR can be stored locally in the MPR. Subscriber profile data includes subscriber specific data related to service entitlement, service prohibition, and other subscriber profile data for policy rule generation and service enforcement. The subscriber profile data can include policy-related data, such as rate plan, rate plan categories, service entitlement for rate plan or rate plan categories, preemption priorities for differential charging or treatment types, and service related roaming entitlement. Subscriber profile data can also include payment type information, class of service (CoS) entitlement for messaging, such as short message service (SMS) and multimedia message service (MMS) messaging, as well as other network services. EX-1004, 12:61-13:26; EX-1003, ¶64.

Poh's subscription profile data can include all available service plans offered by an operator, including various categories, such as data rate plans for standalone

or integrated network cards for use in computer systems (e.g., laptop computers), data rate plans with voice plan add-ons, data rate plans combined with voice plans, international voice plans, international data plans, pooled plans, government plans, WiFi add-on plans, device-specific plans, push email plans, business plans, media bundles, global positioning system (GPS) plans, any combination thereof, and the like. EX-1004, 13:38-49; EX-1003, ¶65.

Poh's provisioning system processes the policies from the MPR using Policy Intelligence Rules System (PIRS) (green) to translate policies into rules in the form of executable instructions, which are sent from Policy Configuration and Provisioning Server (PCPS) (green) for use by network elements such as PCRF, PCEF, and/or Intelligent Security Gateway (ISGW) (brown) in a wireless access network (pink) servicing wireless end user devices (gold). EX-1004, 13:60-14:2; EX-1003, ¶66.

Poh's access network (pink) provides devices (gold) access to services and applications provided by the application functions (AF's) via wireless access technologies. Devices can include handheld devices such as an information appliance, a smartphone, a personal digital assistant (PDA), a mobile phone, a personal communicator, and a handheld game console; other mobile devices such as laptop computers; stationary devices such as desktop computers, servers, and the like; and various other telephony devices. EX-1004, 14:64-15:7. EX-1003, ¶67.

(b) Policy Processing into Rules Instructions

Poh's PIRS (i) takes operator and global subscriber policies from the MPR, and subscriber and subscription profile data from the ESPR, (ii) identifies policy conflicts and resolves conflicts (a form of prioritization), and (iii) determines applicable rules to be sent to Poh's PCPS, which sends those rules (in the form of executable instructions) to configure the network layer for rule decision and enforcement operations. EX-1004, 11:26-28, 13:64-14:2; 15:60-16:2, 16:61-65, 18:41-44. EX-1003, ¶68.

Fig. 7 shows the operation of the PIRS:

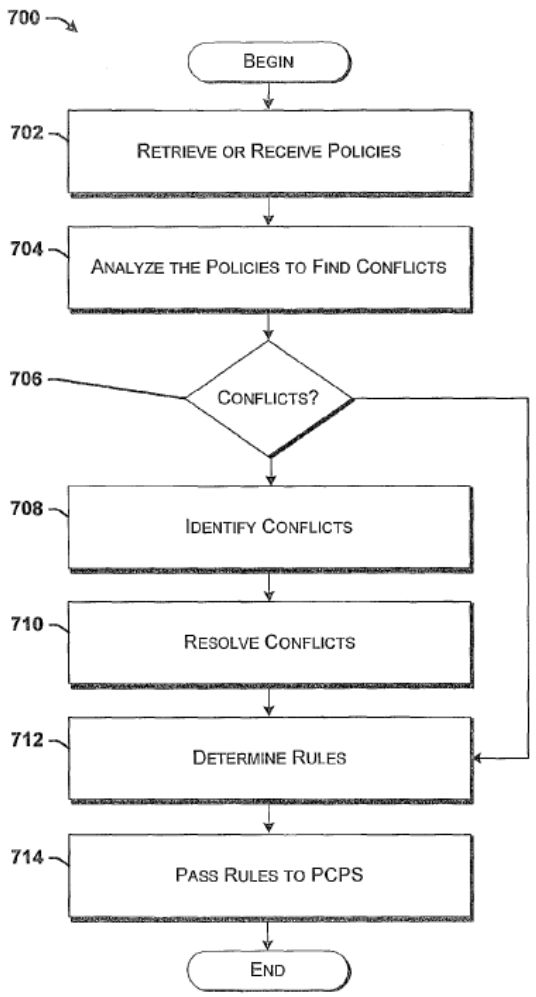


FIG. 7

EX-1004, FIG. 7, 19:4-20:36. The operation of Poh's PIRs and Figure 7 is detailed for element [1.3] below. EX-1003, ¶¶69-70.

(c) Rule Provisioning and Enforcement

Poh discloses that each network resource can have its own policy decision function and policy enforcement point. EX-1004 1:22-25. Policy decisions typically involve examining (e.g., filtering) some aspect of network traffic, and an

enforcement action is taken for the traffic in the event of a match. EX-1004, 1:25-35 (detailing charging policy enforcement and actions). EX-1003, ¶71.

Poh's PCPS can identify rules for provisioning the PCRF, PCEF, OCS, and ISGW network elements. EX-1004, 14:10-13, 11:57-64, 24:1:8, FIG. 10. Rules are passed from the PCPS to the network elements as instructions. EX-1004, 11:26-28; 16:32-35; 18:41-48, 21:8-34; EX-1003, ¶72.

Poh's PCRF is a decision point function in the network layer for control, altering of QoS, where applicable, and providing dynamic or personalized charging rules at a subscriber level. The dynamic charging rules can be operator-defined such as roaming control, usage threshold, subscriber entitlements, subscriber prohibitions, and/or subscriber and subscription profile data. The PCRF can also trigger messages and/or notifications to subscribers for events such as differential charges, or if the PCRF is triggered to treat the subscriber differently than the subscriber's expected treatment. For example, the PCRF can note that an enhanced charge rate, dropped IP flow, and/or QoS change will be invoked for a service or application. Upon such a determination, the PCRF (or PCEF) triggers a subscriber notification for the change. EX-1004, 14:17-35. *See also* EX-1004, 18:26-43 (policy trigger event includes a subscriber request for a network resource such as a service, application, QoS or the link). EX-1003, ¶73.

Poh's PCEF is an enforcement point function that can reside in a gateway function 130. The PCEF enforces subscriber level control and charging policies for packet data protocol (PDP) contexts and IP flow, for example. The PCEF can be invoked by the rules or charging event trigger and can trigger the OCS to take actions including, for example, providing an "advice of charge," or tracking usage. EX-1004, 14:36-46; EX-1003, ¶74.

(d) ISGW

Poh's ISGW implements security policies provisioned to it from the PCPs. EX-1004, 11:57-64, 24:1:8, FIG. 10. Using the security policies, the ISGW monitors network traffic and recognizes security threats. EX-1004, 23:8-11; 24:31-38. The ISGW sends information relating to security threats directly to a policy enforcement and/or access control enforcement point such as, for example, the PCRF. EX-1004, 23:17-20. The ISGW can analyze the security threat to determine an enforcement point including the ISGW itself or the PCRF, the PCEF, or another network node. EX-1004, 39-50; EX-1003, ¶75.

To the extent Poh does not provide the details of filtering performed by rules or the specific prioritization and enforcement mechanisms used by Poh, Maes describes these details.

2. Maes

Maes discloses a smart router that analyzes messages and/or packets (or other communications) in a telecommunications network (i.e., traffic), identifies information about the traffic, and applies programmable policies to the messages. EX-1005, Abstract, [0007], [0019], [0022]. Maes' policies address processes as security, charging, logging, auditing, quality of service (including throttling, prioritized routing, etc.), privacy, preferences, and anything else specified by a combination of conditions and actions. EX-1005, [0023]. A "policy rule" is a "combination of a condition and actions to be performed if the condition is true." EX-1005, [0024]. EX-1003, ¶¶78-79.

An operator defines business objectives implemented as policies enforced through rules. For example, policies can include "any combination of rules, including any combination of conditions and actions" and workflows or business processes can "describe sequences in which rules are executed, or how conditions may be combined with action to enforce the one or more policies on a communication." EX-1005, [0025]. "A workflow or business process includes a logical combination of one or more conditions to be satisfied and one or more actions to be executed to enforce or evaluate the one or more policies." EX-1005, [0025]. EX-1003, ¶80.

Maes' policies include complex nested policy arrangements. For example, Maes incorporates by reference US 11/024,160, which issued as U.S. 8,032,920

("Maes II") (EX-1011). EX1005 [0025].[2] Maes II discloses that "each policy … may itself be composed of multiple policies, which further evaluate conditions and/or perform actions." EX-1011 3:13-17. Maes II teaches that it was known to use any logical arrangement or sequence of conditions and actions. EX-1011 3:35-46, 4:37-47. Policies and actions can be executed serially (as discussed above) or in parallel and policies to be applied may depend on the results of previous actions. EX-1011, 1:48-50; 5:4-5; 6:8-11; 6:37-62. EX-1003, ¶81.

Exemplary policies described by Maes include:

- Conditions and actions to check the load of a network route or an end point and redirect a message accordingly where possible and advantageous (*i.e.*, load balancing).
- Check the QoS for the traffic or traffic type and route accordingly.
- Throttle back traffic when maximum capacity is reached, or when other conditions are met, such as receiving more message traffic than is authorized.

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[2] A patent that is specifically incorporated by reference is broad and unambiguous, and plainly sufficient to incorporate the referenced patent in its entirety. *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 907 (Fed. Cir. 2018).

- Check account standing and charges, such as within the service layer to a charging enabler, or to a billing system capable of correlating them with the information about the service if available.
- Determine that traffic may have to be filtered, or may require further processing in the service layer. For example, a policy can determine that traffic pertains to messaging such as MMS or email, and can send the traffic to a filtering application (e.g., content filtering, anti-spam, antivirus, privacy/preference policies of target, etc.).

EX-1005, [0026]-[0027]; EX-1003, ¶¶82-87.

FIG. 2 shows the smart router 202:

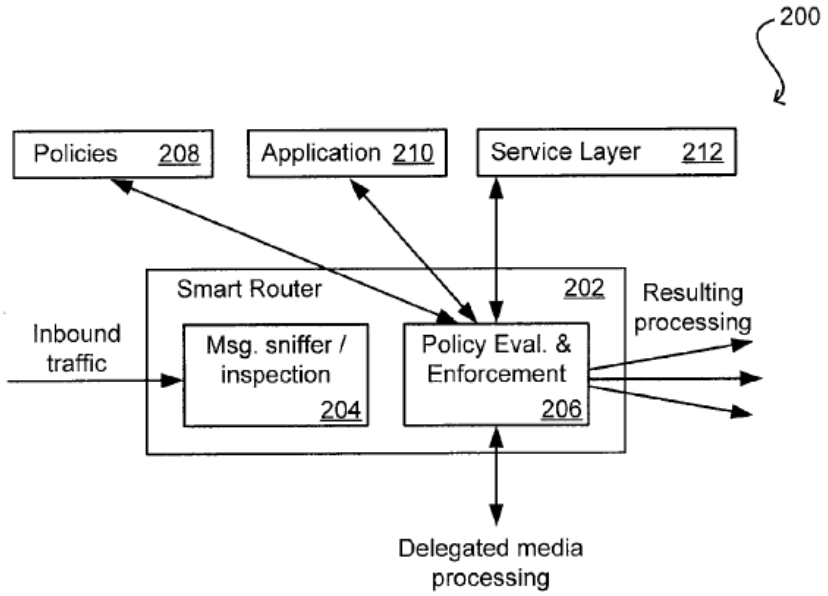


FIG. 2

EX-1005, FIG. 2. In this figure, inbound traffic is received by a sniffer or message inspection module 204 of the smart router 202. A policy evaluation and enforcement module 206 of the smart router receives messages from the message inspection module 204, and applies policies to the messages. EX-1005, [0028]. EX-1003, ¶¶88-89.

3. Motivation To Modify Poh With The Teaching Of Maes

A POSA would have been motivated to combine Poh with Maes with a reasonable expectation of success. EX-1003, ¶¶120-130. Poh teaches a provisioning system for a wireless access network that (i) obtains and stores policies, (ii) processes those policies to create rules (in the form of instructions), where processing those policies involves giving one policy precedence over another, and (iii) provisions those rules to network elements in the wireless access network for policy enforcement. While Poh may not expressly state that each policy has (i) a "traffic classification filter" for filtering traffic events by a traffic inspection system and (ii) an enforcement action that is triggered in a network policy enforcement system, or state that one traffic classification filter can be given "priority" over a second traffic classification filter, Maes discloses that each rule that effectuates a policy is a "combination of a condition and actions to be performed if the condition is true." EX-1003, ¶122.

Maes also discloses that policies are applied to traffic that has been inspected by a sniffer/inspection module if they match traffic criteria for application of the policy. Maes also confirms that rules can be arranged in any sequence, with any combination of conditions and actions, to effectuate the business objectives of the policy or policies, i.e., "policies can address such processes as security, charging, logging, auditing, quality of service (including throttling, prioritized routing, etc.), privacy, preferences, and anything else specified by a combination of conditions and actions." EX-1005, [0023]; EX-1003, ¶123.

Thus, a POSA understood that policy rules with criteria for filtering (matching) traffic (e.g., to identify traffic for quality of service, throttling, prioritized routing, etc.) and actions to be taken upon a match, and prioritization of such rules by their traffic classification filters, were well known in the art as evidenced by Maes. A POSA would have understood the types of rules disclosed in Maes, and their prioritization, could be used by the provisioning system of Poh for provisioning Poh's network elements, such as Poh's PCRF, PCEF and/or ISGW network elements, to achieve Poh's policy objectives. EX-1003, ¶124.

A POSA would be motivated to modify the teachings of Poh to use the rules of Maes, where each rule or group of rules includes a traffic classification filter and an action or actions to be taken. For example, the types of policies—and thus the

types of rules that embody those polices—used in both Poh and Maes overlap, including policies for security, charging, logging, auditing, QoS (including throttling, prioritized routing, etc.), and privacy, for example. *See* EX-1004, 11:57-67, 14:17-24; EX-1005, [0023]. Further, Poh and Maes both disclose the use of those policies in wireless access networks, where rules embodying those policies are enforced against network traffic by enforcement points. EX-1003, ¶125.

A POSA would have also been motivated to order the rules of Poh, as suggested by Maes, in an order that gives priority to a first rule's traffic classification filter over a second rule's traffic classification filter. Indeed, Poh already discloses that as part of resolving conflicts of one policy over another, one policy can be given "precedence" over another. A POSA understood that "precedence" is a form of "priority". A POSA would have understood, as confirmed by Maes, that one technique for giving a policy precedence over another is to give that policy priority over the other by ordering its rules such that they are executed—and thus its filtering criteria is evaluated—before the other. EX-1003, ¶126.

A POSA would be confident of the success of the modification as it is a software solution that uses known techniques—rules and logical arrangement of

rules—for their intended purpose—implementing objectives of policies in a network. EX-1003, ¶127.

Poh and Maes are also analogous art to the claimed invention, being in the same field of network communications, including network service plan provisioning systems for network policies. EX-1001, claim 1; EX-1004, 1:8-24; EX-1005, [0007], [0024]; EX-1003, ¶128.

Further, the combination of Poh and Maes is directed to the same problem as the '543 Patent—properly provisioning network elements to implement network and operator policies and objectives—and proposes the same solution—provisioning network elements with the appropriate logical arrangement of rules for enforcing network and operator policies and objectives. Thus, the Challenged Claims are unpatentable over this combination. EX-1003 ¶129.

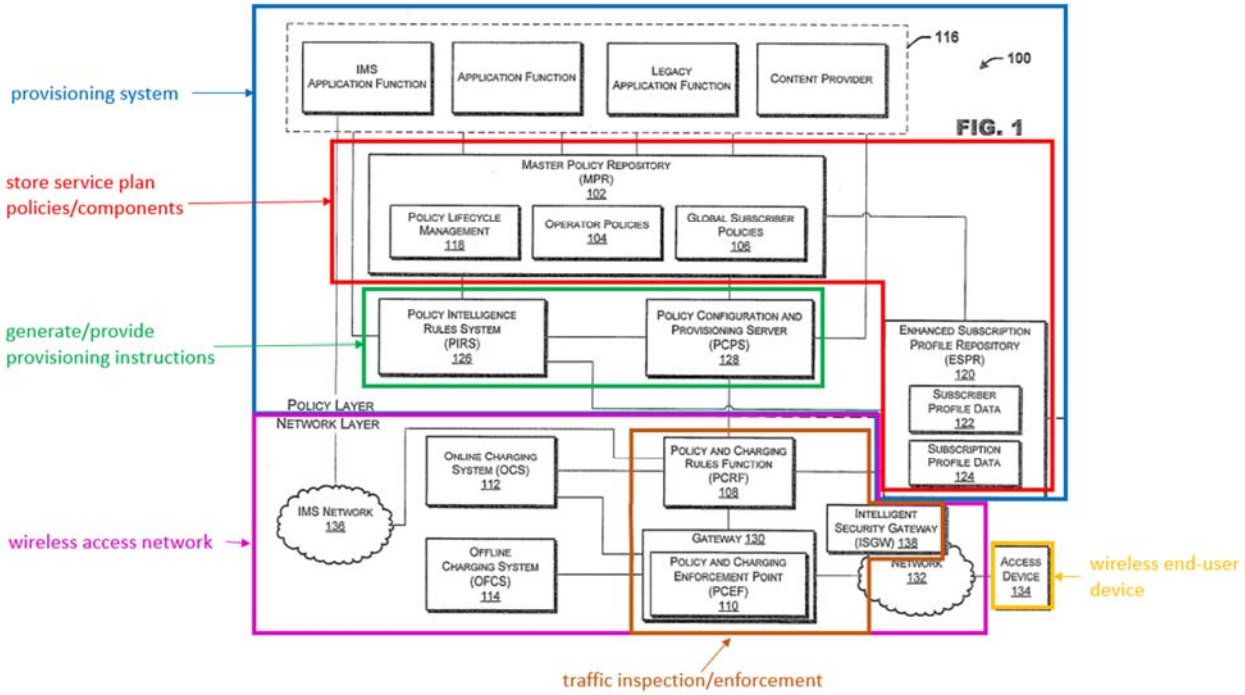
4. Detailed Application of Poh and Maes to the Challenged Claims[3]

<u>Claim 1</u>

[1.0] A network service plan provisioning system communicatively coupled to a wireless end-user device over a wireless access network, the network service plan provisioning system comprising one or more network elements configured to:

[3] As used herein, "discloses" or "teaches" includes that the reference's disclosure renders the discussed concept (element, claim) obvious to a POSA.

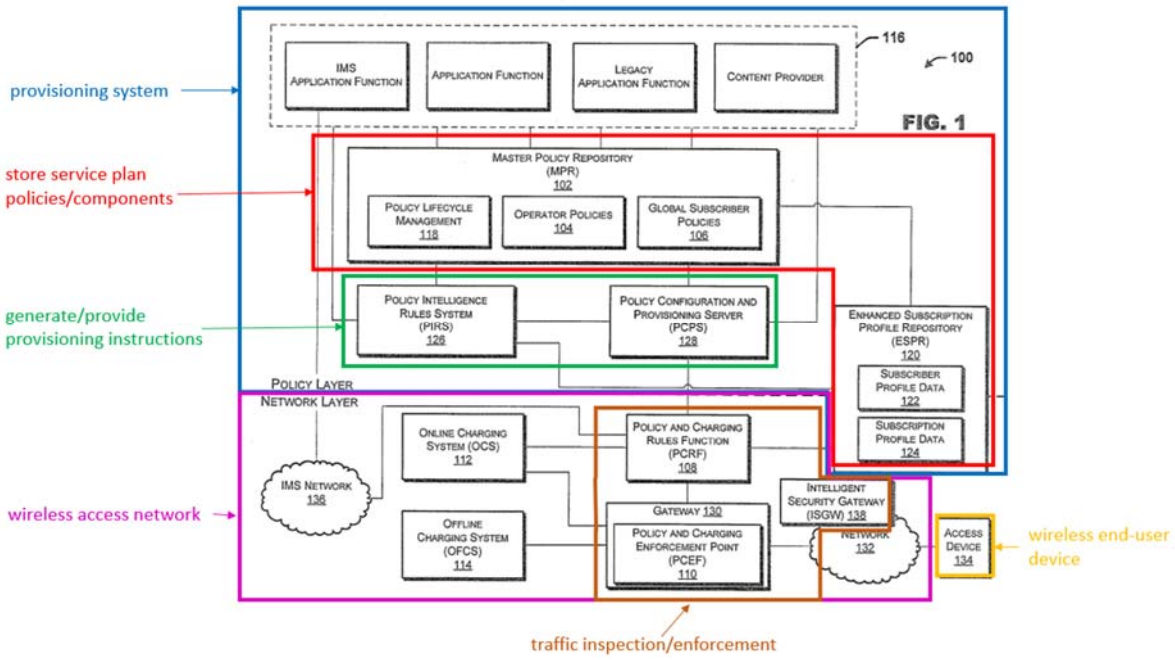
If the preamble is limiting, Poh's FIG. 1 illustrates a network service plan provisioning system (blue) communicatively coupled to a wireless end-user device (gold) over a wireless access network (pink), the network service plan provisioning system comprising one or more network elements (blue, red, green, brown).



EX-1004 FIG. 1, annotated ("Annotated FIG. 1). EX-1003 ¶¶134-135.

[1.1] obtain and store a first service plan component and a second service plan component,

Poh's Master Policy Repository (MPR) 102 (red) stores and/or retrieves all policies (*obtain and store a first / second service plan components*). EX-1001 19:25-27; EX-1003, ¶¶137-143.



Specifically, Poh's policy realization framework is divided into a policy layer (blue) and a network layer (pink). Poh's policy layer handles policy management, rule generation for implementing policies and provisioning of the network layer with generated rules.

Poh's policy layer includes application and service policy management systems and network policy management systems. The policy layer stores, organizes, determines, and applies policy rules to services requested by subscribers or other entities. The policy layer provides common policy rules across services and applications, and policy rule management. The policy layer dynamically determines rules based upon operator policies, network policies, subscriber specific policies, subscription specific policies, subscriber profile data, subscription profile data, and/or subscriber preferences. EX-1004 11:9-33. EX-1003, ¶¶139-140.

Further, Poh's MPR (red) is part of the policy layer and receives, retrieves, accesses, organizes, and/or manages operator policies and global subscriber policies. EX-1004, 11:53-55. Further, Poh's MPR can be fed by other policy repositories, such as an enhanced subscription profile repository (ESPR) that can be configured to store subscriber and subscription profile data and subscription profile data. In an embodiment, at least a portion of the data stored in the ESPR can be stored locally in, or migrated to, the MPR. EX-1004 12:55-13:2; EX-1003, ¶141.

As detailed below in limitation [1.2], policies for the operator / network / subscriber / subscription, subscriber / subscription profile data and/or subscriber preferences stored in the MPR include *a first service plan component and a second service plan component*. EX-1003, ¶142.

> ***[1.2] the first service plan component comprising (1) information specifying a first traffic classification filter for filtering a traffic event in a network traffic inspection system, the traffic event being associated with the wireless end-user device and (2) a first network policy enforcement action that is triggered in a network policy enforcement system when the traffic event possesses a characteristic that matches the first traffic classification filter, and the second service plan component comprising (a) information specifying a second traffic classification filter for filtering the traffic event in the network traffic inspection system, and (b) a second network policy enforcement action that is triggered in the network policy enforcement system when the traffic event possesses a***

characteristic that matches the second traffic classification filter;

Poh discloses this limitation in the PCRF and PCEF actions that receive instructions to implement rules and enforce them, based on policies stored in the MPR. EX-1003, ¶¶145-159. This element basically recites having two rules with each rule having a specific condition (filter) and action that occurs when that rule's condition is met. EX-1003, ¶145.

As an initial matter, the '543 Patent does not describe what a "characteristic" is, but a POSA understood it is a condition that triggers a rule, e.g., QoS, roaming, etc. EX-1003, ¶147.

Poh provides several examples. For example, Poh's PCRF is a decision point function in the network layer for control and is able to alter the QoS of a communication from a subscriber based on subscriber entitlements, subscriber prohibitions, and/or subscriber and subscription profile data 122, 124. EX-1004 14:17-24. EX-1003, ¶148. This is an example of a first component comprising (1) identifying a required level of QoS for a specific client requesting wireless access, the traffic event being associated with the wireless end-user device (*information specifying a first traffic classification filter …*) and (2) altering QoS to the required level for the subscriber (*a first network policy enforcement action … triggered … when the traffic event possesses a characteristic that matches the first traffic classification filter*). EX-1003, ¶¶148-150.

Similarly, this passage shows a first component that specifies a particular characteristic (such as a usage threshold or subscriber entitlement for a particular service) and a resulting action when a filter specifying that characteristic is matched (such as the actions of differential charging or denying/allowing/restricting the particular service based on the subscriber plan or entitlements and/or the action of notifying the subscriber). "The PCRF 108 can also trigger messages and/or notifications to subscribers for events such as, for example, differential charges, or if the PCRF 108 is triggered to treat the subscriber differently than the subscriber's expected treatment. For example, the PCRF 108 can note that an enhanced charge rate, dropped IP flow, and/or QoS change will be invoked for a service or application." EX-1004, 14:25-35. See also EX-1004, 21:50-22:3 (identifying rules / conditions for actions such as differential charging or disabling applications); 8:57-63 (actions such as differential charging and notification); 11:44-52 (actions such as differential charging, gating control, notifications); claim 7 (listing different policies resulting in different actions); claim 3 (deny or allow access rule). EX-1003, ¶151.

In the context of Poh, "gating control" would include actions such as denying, allowing or restrict a particular service. EX-1004, 11:23-30; 3:33-42, 19:60-63; 20:37-54. EX-1003, ¶152.

Each of these rules / actions above can correspond to each of the first and second service plan components. EX-1003, ¶153.

Further, Poh's PCEF is an enforcement point function that can reside in gateway. The PCEF enforces subscriber level control and charging policies by the rules passed to the PCEF by the PCRF. The subscriber policies can include policies that are global to all subscribers and applied to one or more applications or services that are accessible to the operator's subscriber base. Global subscriber policies can be defined for each service or application. A global subscriber policy includes a service aware roaming control policy to prevent a subscriber from accessing operator-defined services or applications while roaming. EX-1004 12:23-39. This is an example of a second component comprising (1) identifying whether or not the wireless subscriber requesting wireless access is roaming (*information specifying a second traffic classification filter …*) and (2) preventing the wireless subscriber from accessing operator-defined services or applications while roaming (*a second network policy enforcement action … triggered … when the traffic event possesses a characteristic that matches the second traffic classification filter)*. EX-1003, ¶154.

Additionally, Poh teaches different operator policy types used for inspection and enforcement of traffic including gating control policies, data throttling policies, and packet inspection policies. EX-1004 11:57-60. Thus, Poh includes

different combinations of policies that include first and second components for inspecting traffic and triggering an enforcement action. EX-1004 21:53-61 (various "combinations" of different policies including roaming); 13:38-59. EX-1003, ¶155.

Even though Poh does not use the term "traffic classification filters," a POSA understood that Poh discloses traffic classification filters. EX-1003, ¶156 (citing EX-1001, 35:52-36:46). As discussed in the State of the Art section above, a POSA understood that it was known that policies are enforced by policy enforcement points, and these policy enforcement points receive rules that include matching (*i.e.*, filtering) criteria for identifying packets and data flows and enforcement actions to be applied upon matches. EX-1006 p. 253; EX-1010, §§ 4.1-4.3, 6.2.2, 6.3, 6.5; EX-1007 p. 13; EX-1008 p. 2978; EX-1003, ¶156. A POSA understood Poh's rules include a traffic classification filter because those rules includes (1) matching criteria (as described above), and (2) an enforcement action (as described above). EX-1003, ¶¶156-157.

If Patent Owner asserts that Poh does not expressly state that its rules include *traffic classification filters*, a POSA would be motivated to modify the teachings of Poh to include traffic classification filters as taught by Maes for the reasons discussed in the Motivation to Modify Teachings section (§VI.A.3), above. Maes describes that a policy rule is a "combination of a condition and actions to be

performed if the condition is true." EX-1005, [0024]. Maes further describes that policies are applied to traffic that has been inspected by a sniffer/inspection module if they match traffic criteria for application of the policy traffic classification filters. Thus, as described in the Motivation to Modify Teachings section, a POSA would be motivated to modify the teaching of Poh so that each policy or policy rule has (i) a "traffic classification filter" for filtering traffic events by a traffic inspection system and (ii) an enforcement action that is triggered in a network policy enforcement system. EX-1003, ¶158.

> ***[1.3] process the first service plan component and the second service plan component to create a network provisioning instruction set in accordance with a prioritization of the first traffic classification filter over the second traffic classification filter, the network provisioning instruction set comprising one or more traffic inspection provisioning instructions for the network traffic inspection system and one or more policy enforcement provisioning instructions for the network policy enforcement system, the network traffic inspection system and the network policy enforcement system implementing one or more policies applicable to the wireless end-user device;***

Poh discloses this element. EX-1003, ¶¶161-174. Effectively, this element recites two actions: (1) prioritizing the first filter over the second filter and (2) converting the rules to "instructions" for the network to implement. Poh's Policy Intelligence Rules System (PIRS) 126 (green) prioritizes rules. Poh's PCPS converts the rules to instructions. EX-1003, ¶161.

Poh's PIRS receives the policies and determines rules for the network to use in addressing subscriber requests (*process the first service plan component and the second service plan component to create a network provisioning instruction set*). EX-1004 18:59-61. Poh's PIRS analyzes the policies to determine how the network should handle the request for resources. Rules determination includes reconciliation of the policies, to determine which policies should be given precedence, and/or additional operations to determine how the network, application or service should be instructed to implement and/or enforce the determined policy (*create a network provisioning instruction set … with a prioritization of the first traffic classification filter over the second traffic classification filter*). EX-1004 20:26-35; EX-1003, ¶162.

The rules from Poh's PIRS are sent to Poh's PCPS to generate instructions for the PCRF, PCEF and/or ISGW to implement policy rule charging decisions, charging, and enforcement for the wireless subscriber (*the network provisioning instruction set comprising… traffic inspection provisioning instructions… and … policy enforcement provisioning instructions … implementing one or more policies applicable to the wireless end-user device*). EX-1004 16:28-34 (PCPS "receive[s] rules from the PIRS 126 and send[s] instructions to the PCRF, PCEF, and OCS … for policy rule charging decisions, charging, and enforcement purposes. The PCPS 128 can receive rules from the PIRS 126, generate instructions for the PCRF, other

elements in the network layer, and/or application servers, and send the instructions to the appropriate policy element"), EX-1004, 21:8-34, Figs. 3, 8; EX-1003, ¶163.

FIG. 7 schematically illustrates PIRS operation.

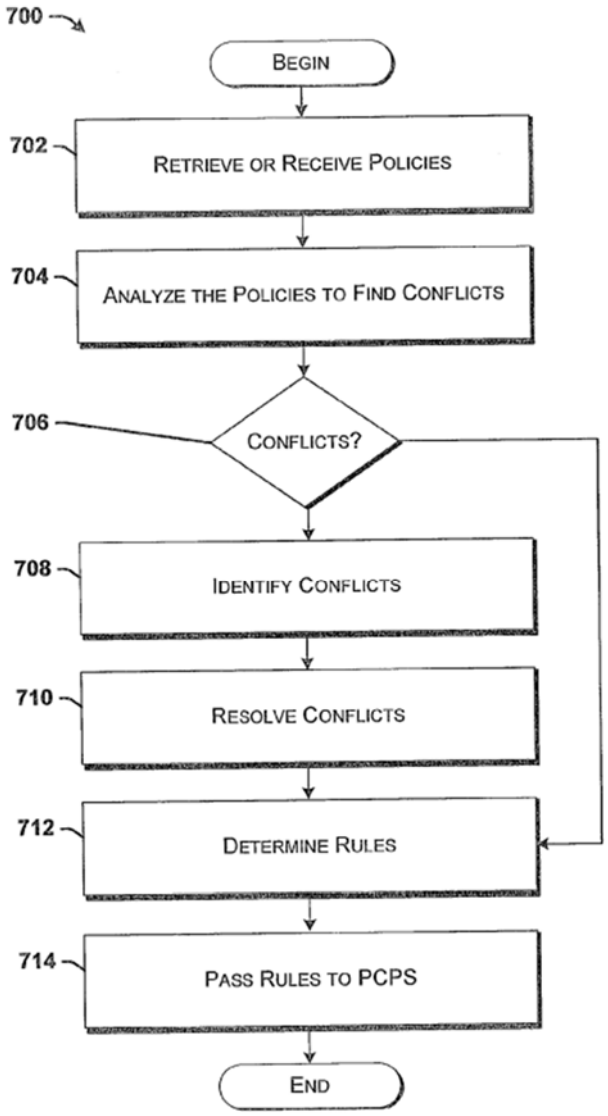


FIG. 7

EX-1004, Fig. 7.

In step 702, the PIRS retrieves and/or receives operator policies, global subscriber policies, subscriber profile data and/or subscription profile data from the

MPR. Events, such as the request of a network resource by a subscriber, can trigger sending of policies to the PIRS. EX-1004, 19:19-29; EX-1003, ¶¶164-166.

At steps 704-708, the PIRS analyzes policies to identify conflicts. For example, operator policies, global subscriber policies and/or subscriber policies may conflict with each other. Policy conflict identification includes identifying and tagging the conflicting policies and to perform more operations on the policies. EX-1004 19:30-48; EX-1003, ¶167.

At step 710, PIRS resolves conflicts based on criteria such as policy conflict resolution rules and/or a policy resolution application. For example, if a network operator may specific policies to deny services based on privacy, safety, and/or liability concerns. PIRS can be configured to address any requests for services addressed by the operator policy by giving the operator policy precedence in policy conflict resolution, thereby determining to deny the service, even if a subscriber/subscription policy, allows such services. EX-1004 19:49-64; EX-1003, ¶168.

Similarly, PIRS can be configured to give subscriber policies precedence over operator policies and/or global subscriber policies. EX-1004, 19:65-20:25. By way of example, a subscriber can decide to disable SMS for an account. One or more subscriber policies can be generated to reflect the subscriber's choice. The network operator can determine that it wants to grant SMS resources by default to

subscribers who request SMS resources. To implement this policy, the operator creates operator policies and/or global subscriber policies that grant SMS resources by default. PIRS can resolve conflicts by giving the subscriber's policies precedence over the operator policies and/or the global subscriber policies. For example, though an SMS resource may be granted by default to all subscribers, this particular subscriber can be denied the SMS resource to enforce the subscriber's policies 122, 124. Other conflict scenarios and resolution methods are possible and contemplated. EX-1004, 19:65-20:25; EX-1003, ¶169.

Thus, as detailed above, PIRS can be configured to resolve conflicts with operator policies by giving the operator policies precedence (*... a prioritization of the first traffic classification filter over the second traffic classification filter*). EX-1004 19:54-56; EX-1003, ¶170.

At step 712, PIRS determines rules based upon policies. PIRS analyzes policies to determine how the network should handle the resource request. Determination includes policy reconciliation, precedence, and/or additional operations to instruct implementation and/or enforcement of the determined policy. EX-1004 20:26-36; EX-1003, ¶171.

Furthermore, PIRS can determine a rule that reflects action needed to grant, restrict, and/or deny the requested resource. The determined rules reflect action determined by reconciling various policies or one or more policies that had no

conflicts. For example, if analysis of an operator policy reflected a network operator's desire to grant a network resource, and analysis of subscriber policies also resulted in granting of a network resource, PIRS generates a rule that reflects the desired action, i.e., to grant the requested network resource to the subscriber. The generated rules can describe the determined network action in response to the resource request. At step 714, the rule is passed to other network elements. EX-1004 20:37-53; EX-1003, ¶172.

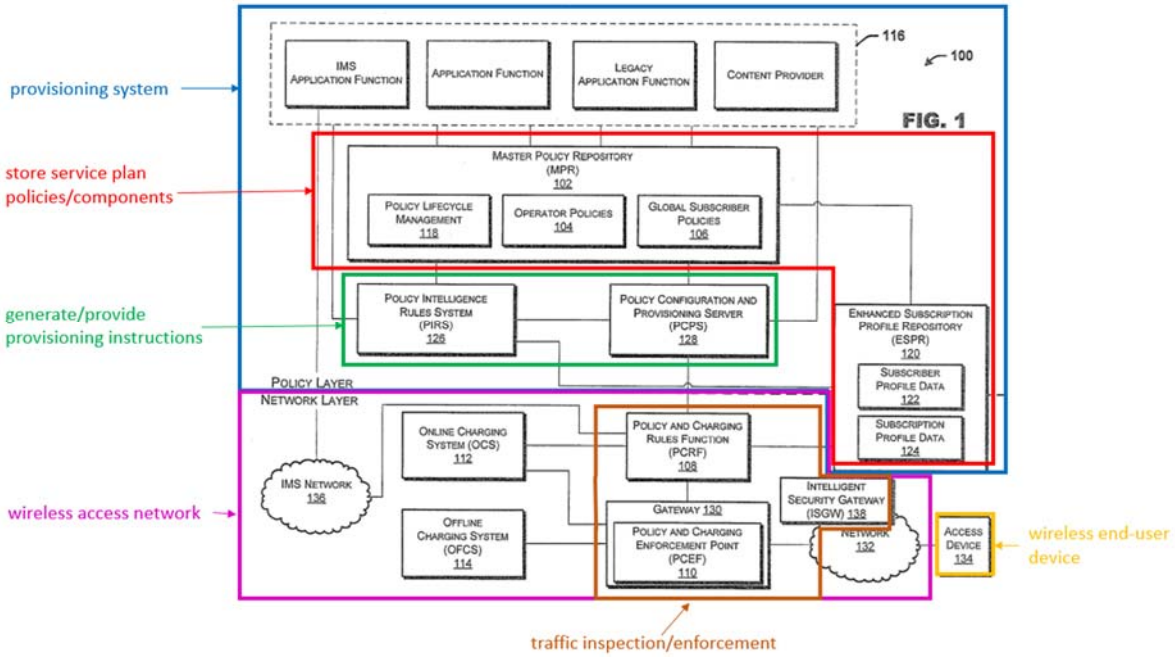
Poh's PCPS receives rules, generates instructions implementing those rules and provides those instructions to policy elements such as the PCRF and PCEF for implementation. EX-1004 14:4-16; 16:28-34, 18:41-44, 20:61-61:34; Fig. 8; EX-1003, ¶173.

If PO asserts that Poh's determining of rules giving precedence to traffic classification filter over another is not the claimed *prioritization*, a POSA would be motivated to modify the teachings of Poh to include prioritization of Poh's rules by their traffic classification filters as taught by Maes for the reasons described in the Motivation to Modify Teaching section. EX-1003, ¶174.

[1.4] provide the one or more traffic inspection provisioning instructions to the network traffic inspection system; and

As detailed in [1.3] Poh's PCPS (brown) is configured to receive rules created by the PIRS and provide the instructions to elements such as the PCRF, PCEF and/or ISGW, any one of which is or includes a network traffic inspection

system (*provide … traffic inspection provisioning instructions to the network traffic inspection system*). EX-1004 14:4-10; 16:28-31; EX-1003, ¶¶176-177.



[1.5] provide the one or more policy enforcement provisioning instructions to the network policy enforcement system.

As detailed in [1.3-1.4], Poh's PCRF, PCEF, and/or ISGW is or includes a network traffic inspection systems and is or includes a network policy enforcement system and receives provisioning instructions from the PIRS. Further, Poh contemplates multiple PCRFs, PCEFs and ISGWs. EX-1004 14:4-10; 16:28-34; EX-1003, ¶¶179-181.

In some embodiments, one of the PCRF, PCEF and ISGW operates as the network traffic inspection system and another of the PCRF, PCEF and ISGW operates as the network policy enforcement system. For example, the ISGW

implements security policies provisioned to it from the PCPS to monitor network traffic and recognize security threats. EX-1004, 11:57-64, 23:7-24:11, 24:31-38, FIG. 10. The ISGW sends information relating to security threats to a policy enforcement and/or access control enforcement point such as the PCRF. EX-1004, 23:17-20. More specifically, the ISGW analyzes security threats to determine an enforcement point for a security policy that addresses the recognized threat. The enforcement point can be the ISGW itself or an access control enforcement point such as the PCRF, the PCEF, or another network node. EX-1004, 24:39-50; EX-1003, ¶181.

<u>Claim 8</u>

> ***The network service plan provisioning system of claim 1, wherein at least one of the one or more policies is dependent on a network state.***

Poh's policies include being dependent on whether the device is roaming (*dependent upon a network state*):

> a global subscriber policy can be a service aware roaming control policy that can prevent a subscriber from accessing operator-defined services or applications while roaming.

EX-1004 12:28-31; FIG. 1, claim 7 (listing policies with different states. EX-1003, ¶¶231-233.

Further, Poh's subscriber profile data and subscription profile data include location information and service related roaming entitlements (*dependent upon a network state)*. EX-1004 12:61-64; 13:9-14, 18:45-60. EX-1003, ¶233.

Claim 9

> ***The network service plan provisioning system of claim 8, wherein the network state comprises a congestion state of the wireless access network, a network location, a type of the wireless access network, whether the wireless access network is a roaming network, a routing identifier associated with the wireless access network, or a combination of these.***

Poh discloses this limitation for the reasons for Claim 8 (*e.g.*, *roaming network, location*).

Further, Poh's policies may be based on quality of service (QoS) (*comprises a congestion state of the wireless access network*). EX-1004 18:26-44. Poh's disclosure is consistent with the disclosure of the '543 Patent that the congestion state includes the QoS class settings of packet error rate, jitter and delay settings, queue settings, and tag settings. EX-1001 38:28-35. Poh's policies may be related to "networks" which renders obvious a type of the network. EX-1004, 18:13-16, 13:47-55 (specific application policies for legacy networks). EX-1003, ¶¶235-236.

Claim 10

> ***The network service plan provisioning system of claim 9, wherein the congestion state is based on a time of day, a measure of network congestion, a measure of a delay, a measure of a jitter, a packet error rate, or a combination of these.***

Poh discloses this limitation for the reasons for Claim 9. A POSA understood that QoS class settings include packet error rate, jitter, delay settings and time window parameters. EX-1001 38:28-35. A POSA would recognize that "Standardized QoS characteristics" were known to include "packet delay budget" (delay settings) and "packet error loss rate" (packet error rate) as those concepts had been standardized long prior to the '543 Priority Date. EX-1010, Section 6.1.7.2. EX-1003, ¶238.

<u>Claim 15</u>

> ***The network service plan provisioning system of claim 1, wherein the one or more network elements are further configured to include in the network provisioning instruction set an instruction to assist in enforcing a classification-based charging policy, wherein the classification is selected from the group of classification categories consisting of: application, destination, network, time of day, congestion state, quality of service, content type, and a combination of two or more of the classification categories.***

As discussed for limitation [1.4] and [1.5], Poh's PIRS and PCPS generate instructions provided to the PCEF, PCRF and ISGW for enforcement. Poh's PCRF is a decision point function in the network layer for control, altering of Quality of Service (QoS), and providing dynamic or personalized charging rules at a subscriber level (*an instruction to assist in enforcing a classification-based charging policy*). Poh's classifications include roaming control, and based upon the subscriber entitlements, subscriber prohibitions, and/or subscriber and subscription

profile data, 124. EX-1004 14:17-24. Poh's "policy trigger" includes a "request for a network resource such as a … service, [or] a QoS." EX-1004, 18:30-32. EX-1003, ¶241. The subscriber profile data includes service related roaming entitlement (*an instruction to assist in enforcing a classification-based charging policy)*. EX-1004 13:9-15. EX-1003, ¶241. For example, the classification can include an "application" such as "SMS." EX-1004 20:9-25. Indeed, Poh gives a specific example of using two classifications. EX-1004 12:31-32. ("policy that can prevent a subscriber from accessing operator-defined applications (*applications*) while roaming (*network*)"). *See also* EX-1004 14:29-32 (*QoS / application*).

Thus, a POSA understood that Poh's PCPS can include provisioning instructions to assist in enforcing a classification-based charging policy using multiple of the claimed classifications. EX-1003, ¶242.

<u>Claim 21</u>

> ***The network service plan provisioning system of claim 1, wherein the one or more network elements are further configured to facilitate reuse of the first service plan component, the second service plan component, the first traffic classification filter, the second traffic classification filter, the first policy enforcement action, or the second policy enforcement action in a plurality of service plans by storing the first service plan component, the second service plan component, the first traffic classification filter, the second traffic classification filter, the first policy enforcement action, and the second policy enforcement action as one or more objects in a catalog.***

As described for Claim 1, MPR is the master policy repository storing the first service plan component, the second service plan component, the first traffic classification filter, the second traffic classification filter, the first policy enforcement action, and the second policy enforcement action. The MPR receives, retrieves, accesses, organizes, and/or manages operator policies and global subscriber policies. EX-1004 11:53-56. EX-1003, ¶¶244-248.

Poh does not provide explicit details of the MPR structure. However, the '543 Patent describes that its database model storing provisioning plans is "one of the more common models in use today" being data structures including "fields, records, files, objects, and any other applicable **known** or convenient structures for storing data." EX-1001 11:3-13. Thus, a POSA would be motivated to implement a data structure having the policies stored as objects in a catalog because it uses one of the most commonly "known" models in use at the time the '543 Patent was filed. Using a "catalog" is merely one of a limited number of design choices known to a POSA for which implementation of the profile data would be obvious. EX-1003, ¶245.

Further, Poh discloses that the subscription profile data, which can be stored in the MPR or retrieved from ESPR, can include:

> The subscription profile data can include **all available service plans** offered by an operator as defined, maintained, and updated, for example, by operator service offer management personnel. Service

> plans can include various categories, such as data rate plans for stand alone or integrated network cards for use in computer systems (e.g., laptop computers), **data rate plans with voice plan add-ons**, data rate plans **combined** with voice plans, international voice plans, international data plans, pooled plans, government plans, WiFi **add-on** plans, device-specific plans, push email plans, business plans, media bundles, global positioning system (GPS) plans, **any combination thereof**, and the like. Each service plan can have **normal** operation and **roaming** entitlements for domestic and international plans. Roaming entitlements enable the operator to provide flat rate service plans for international roaming as defined by thresholds, country, and roaming operator.

EX-1004 13:36-59. A POSA understood that this subscription profile data is a *catalog* containing the components recited in claim 21 as *objects* because such objects were a known implementation that allowed for ready access and retrieval of objects stored in computer data structures. EX-1003, ¶¶247-248.

<u>Claim 28</u>

> ***The network service plan provisioning system of claim 1, wherein the one or more network elements are further configured to obtain service plan parameters for multiple service plans, combine one or more service policies for the multiple service plans into one composite-plan policy set, and provision the network policy enforcement system to enforce the composite policies for the multiple service plans.***

Poh discloses composite policies for multiple service plans. For example, Poh discloses "add-on" and "combined" plans. EX-1004 13:36-59 (quoted above in claim 21 analysis). EX-1003, ¶250.

Moreover, as described for Claim 1, Poh describes how to evaluate multiple plans to develop enforcement rules, and the PIRS/PCPS generate provisioning instructions to implement the combined plans (*provision the network policy enforcement system to enforce the composite policies for the multiple service plans*). EX-1004 14:4-10; 16:28-31. EX-1003, ¶251.

Claim 42

> ***The network service plan provisioning system of claim 1, wherein the network policy enforcement system comprises a policy decision element.***

Poh's PCRF is part of the *network policy enforcement system*. *See* Claim 1. Poh's PCRF is a decision point function (*policy decision element*). EX-1004 14:17-24. Moreover, Poh's PCEF and ISGW execute network policy enforcement actions defined in policy enforcement provisioning instructions that are triggered by traffic matches and thus are, or include, a policy decision element. *See* [1.2], [1.3] and [1.5]. EX-1003, ¶253.

Claim 43

> ***The network service plan provisioning system of claim 1, wherein the network policy enforcement system or the network traffic inspection system comprises a gateway.***

Poh discloses this limitation for the reason discussed for Claim 1. Poh's PCEF is an enforcement point function that can reside in gateway 130 (*network policy enforcement system …comprises a gateway*). EX-1004 14:46-39; FIG. 1. Further Intelligent Security Gateway (ISGW) 138 is a gateway. EX-1004, 15:30-32, FIG. 1. EX-1003, ¶255.

Claim 45

> ***The network service plan provisioning system of claim 1, wherein at least a portion of the network policy enforcement system is in a network system communicatively coupled to the wireless end-user device over the wireless access network.***

As detailed in claim 1, Poh's PCEF and ISGW are part of a network system in communication with end user devices. EX-1004 14:46-39; 14:64-67; 23:8-11; FIG. 1. EX-1003, ¶257.

Claim 46

> ***The network service plan provisioning system of claim 1, wherein the network traffic inspection system or the network policy enforcement system comprises a programmable element.***

As detailed in claim 1, PCRF, PCEF and ISGW are (1) part of the enforcement system, and (2) programmable. EX-1004 3:36-39; 9:16-24; 22:50-23:6; FIG. 10. EX-1003, ¶259.

Claim 87

> ***The network service plan provisioning system of claim 1, wherein the one or more policies comprise a traffic control policy.***

Poh discloses this limitation for the reasons in Claims 1, 8 and 15. For example, Poh discloses a roaming policy (*a traffic control policy*).

Poh's disclosure is consistent with the '543 Patent disclosure describing a traffic control policy that permits or prevents roaming to another network. EX-1001 8:66-67. EX-1003, ¶¶261-262.

Claim 88

> ***The network service plan provisioning system of claim 87, wherein the control policy specifies to allow, block, throttle, delay, or defer the traffic event.***

Poh's policies' actions include those that restricts access, (*throttle*), deny access, (*block*), and an allow access (*allow*) to the requested service. EX-1004 5:20-24, 11:26-34, 12:23-33, 18:35-44, claim 3. EX-1003, ¶264.

Claim 89

> ***The network service plan provisioning system of claim 87, wherein the traffic control policy is based on a network state, a device state, a service-plan-usage state, or a combination of these.***

See claims 1, 8, 9 and 87, for example, where the network state is roaming or usage thresholds. EX-1003, ¶265.

Claim 96

> ***The network service plan provisioning system of claim 1, wherein the first service plan component or the second service plan component comprises a carrier component, a network protection component, an application component, a sponsored component, a subscriber-paid component, a marketing interceptor component, a***

parental control component, a bulk component, a post-bulk component, or an end-of-life component.

Poh discloses a variety of policies, including operating and subscriber policies, each of which can include a component in one or more categories recited in the claims:

> Operator policies can include native operator policies and/or shared operator policies (*a carrier component, a network protection component*), such as, but not limited to, gating control policies, data throttling policies, packet inspection policies (*a network protection component*), security policies (*a network protection component*), privacy policies, emergency policies, charging policies, application-specific policies (*an application component*), global application policies, service-specific policies, global service policies, content provider policies, legacy policies….

EX-1004 11:57-67. EX-1003, ¶¶268-269.

<u>Claim 98</u>

The network service plan provisioning system of claim 1, wherein the first service plan component or the second service plan component is associated with a service class.

Poh's subscriber policy-related data includes service entitlement, service prohibition, and other subscriber profile data (*service class*). For example, the subscriber policy related data includes rate plans, rate plan categories, service entitlement for rate plan or rate plan categories, pre-emption priorities for differential charging or treatment types, and service related roaming entitlement for

prepaid or postpaid payment types, as well as class of service (CoS) (all *service class*) entitlement for messaging, such as short message service (SMS) and multimedia message service (MMS) messaging, as well as other network services. EX-1004 13:9-27. EX-1003, ¶272.

Claim 99

> ***The network service plan provisioning system of claim 98, wherein the service class is paid, marketing intercept, carrier, network protection, sponsored, parental control, open access, bulk, post-bulk, or a combination of these.***

Poh discloses this limitation for the reasons in Claims 98, *e.g.*, different "payment types" such as prepaid or postpaid rate plans (*paid*). EX-1004 13:9-27. EX-1003, ¶274.

Claim 120

> ***The network service plan provisioning system of claim 1, wherein the one or more policies comprise a policy associated with a tethering function.***

Poh discloses this limitation. As an initial matter, the '543 Patent does not describe any tethering function. However, a POSA understood that tethering allows a device (*e.g.*, laptop computer) to use a separate device for network access. Poh discloses "Service plans can include various categories, such as data rate plans for **stand alone** or integrated network cards for use in computer systems (e.g., laptop computers), …, WiFi add-on plans." Poh's plans for a "stand alone … network card[]" discloses the claimed tethering function because the "stand alone

card" would be tethered to the laptop either through a connection such as USB or the disclosed "WiFi add-on plan" (*a policy associated with a tethering function*). EX-1004 14:65-15:7; 13:38-59. EX-1003, ¶275.

<u>Claim 121</u>

> ***The network service plan provisioning system of claim 1, wherein the one or more policies comprise a policy associated a web page, a domain, an application, a roaming network, an e-mail service, a networking service, a music download service, a video game service, a multimedia service, or a combination of these.***

Poh discloses several examples of the claimed policies such as policies associated with:

roaming networks (EX-1004 12:29-39; 13:50-59);

e-mail service (EX-1004 13:41-59);

applications (EX-1004 12:17-22; 14:47-55);

music download services (EX-1004 14:48-51);

multimedia services (EX-1004 14:51-55).

EX-1003, ¶276.

B. Challenge 2:

1. Burnett

Burnett teaches a system and method for allowing a wireless subscriber to dynamically update their service plan. Specifically, the system provides the subscriber with a notification via SMS and email that includes a service plan

update offer. In response to the update offer, the subscriber indicates whether it accepted or declined the offer. The system updates the service plan for the subscriber as applicable. EX-1012 1:64-2:12; 2:23-27; 2:28-46. EX-1003, ¶278.

2. Motivation To Combine Poh, Maes and Burnett.

A POSA would have been motivated to combine these references with a reasonable expectation of success. EX-1003, ¶¶279-281. Poh and Burnett: (1) have a same inventor (Lisuan Poh); (2) were filed by the same leading technology company (AT&T); (3) were filed within a few months of each other; and (4) describe overlapping implementations of the same technology (policy enforcement in a wireless network). Poh presents an overall description of the policy enforcement including subscribers managing their subscriptions. Burnett (with the same inventor) provides further details of how subscribers dynamically manage their subscriptions to add or enhance their services. Effectively, Poh and Burnett are two complementary pieces of an overall subscription management system. The proposed modification is that Poh's disclosure (including its existing subscriber management options) is augmented to include the specific disclosure of Burnett allowing for notification and dynamic modification of subscriber profiles. EX-1003, ¶279.

A POSA would be further motivated to make such modification because Poh discloses that it tracks usage by a subscriber and offers dynamic charging using

charging thresholds, and also provides notification to a subscriber related to an enhanced charged rate, and Burnett expressly discloses that it would be mutually beneficial to the subscriber and the service provider to offer to upgrade or downgrade a subscriber's service plan based upon subscriber history and subscriber usage data. EX-1004 14:20-35; EX-1012 1:42-45; 7:40-53. EX-1003, ¶280.

A POSA understood that it would be a simple software modification to present an option to a subscriber to accept or decline a subscription update offer using a wireless phone or computer and thus have a reasonable expectation of success. EX-1003, ¶281.

3. Detailed Application of Poh, Maes, and Burnett to the Challenged Claims

<u>Claim 16</u>

> ***The network service plan provisioning system of claim 1, wherein the one or more network elements are further configured to include in the network provisioning instruction set an instruction to assist in presenting a service buy page notification with an actionable response.***

As discussed for Claim 1, Poh's PIRS and PCPS generate provisioning instructions that are sent to PCRF and PCEF. Some instructions relate to charging the subscriber *to assist in presenting a service buy page notification with an actionable response*. For example, Poh's PCRF can trigger messages and/or notifications to subscribers for events such as, for example, differential charges, or if the PCRF is triggered to treat the subscriber differently than the subscriber's

expected treatment (*presenting a service buy page notification)*. Furthermore, Poh's PCRF can note that an enhanced charge rate, dropped IP flow, and/or QoS change will be invoked for a service or application. Upon such as determination, the PCRF, PCEF or OCF can trigger a notification to a subscriber relating to the change. EX-1004 14:25-35. EX-1003, ¶283.

Further, Poh's subscriber can change preferences for various rate plans frequently (*an actionable response*). EX-1004 21:65-22:3. Thus, a POSA understood that Poh's subscriber could change a rate plan in response to receiving a notification from the PCRF that an enhanced charge rate will be invoked. EX-1003 ¶284.

If PO asserts that Poh does not expressly state *presenting a service buy page notification with an actionable response,* a POSA understood that it would be obvious to modify Poh to include presenting an option to a subscriber to accept or decline a subscription update offer as taught Burnett (*presenting a service buy page notification with an actionable response*). EX-1012 2:39-46. Burnett's subscriber option includes presenting the option on the user's wireless-end user device such as a phone with a user feedback component software for accepting or declining offers. EX-1012, 3:63-65, 5:33-47, 7:54-8:24, 9:31-52. EX-1003 ¶285.

In this regard, the Poh/Burnett combination mirrors the '543 patent which describes a "notification policy structure" that notifies the user of policy

enforcement issues, such as thresholds, expirations, and block events. EX-1001, 13:37-14:3. The '543 system may present "notification actions" for the user to provide feedback or instructions such as buying or approving plan changes. EX-1001, 13:55-14:3. The '543 user may also use a "client dashboard" associated with computers connected to the network infrastructure to "buy" additional services. EX-1001, Fig. 9, 29:63-30:45. EX-1003 ¶286.

Thus, the combination discloses a portion of the policy enforcement system being present on the wireless user's device to allow user notifications of policy events and offer the user the option to provide feedback to the enforcement system such as through buying (or declining) offers. EX-1003, ¶287.

Claim 44

> ***The network service plan provisioning system of claim 1, wherein at least a portion of the network policy enforcement system is on the wireless end-user device.***

The combination discloses this limitation for same reasons as Claim 16. For example, a subscriber receives notifications regarding usage to enforce the subscriber's service plan, including an option to a subscriber to accept or decline a subscription update offer using the wireless end-user device.

The user notification/action/feedback system (both in the prior art and in the '543 patent) comprises a portion of the network policy enforcement system. For example, the '543 patent notification system allows for user "feedback" which

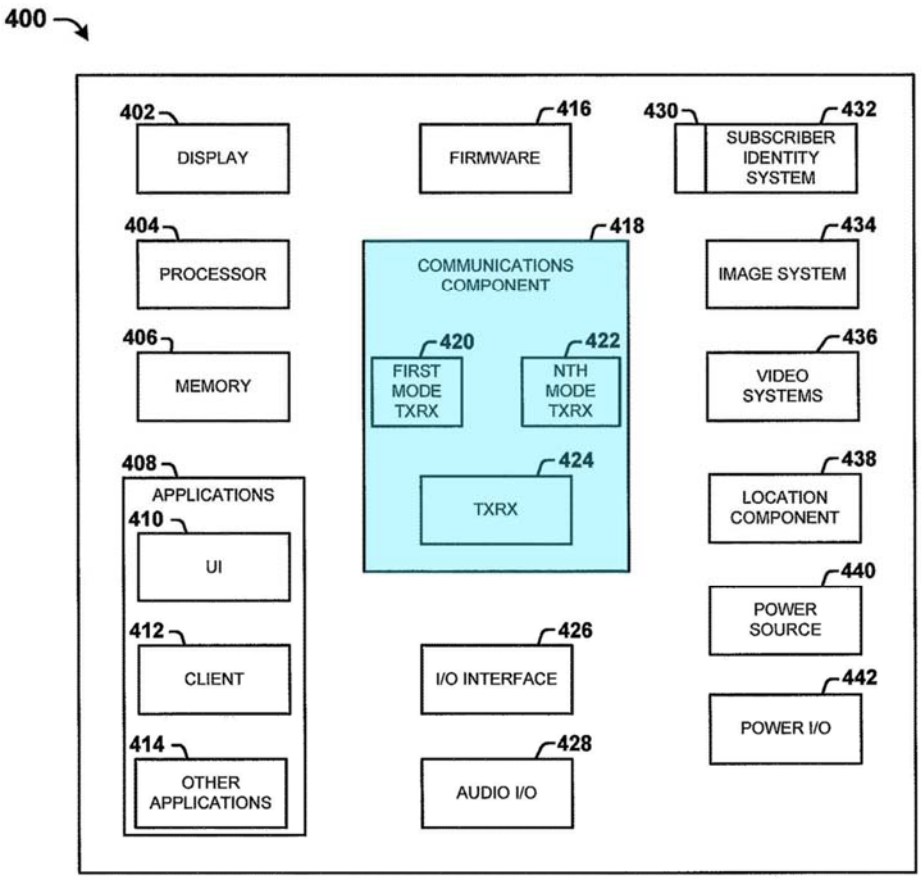
matches Burnett's "user feedback component software." EX-1001, 13:55-14:3; EX-1012, 9:31-52. That "subscriber feedback" is used by the "analytics engine" for policy enforcement. EX-1001, 11:55-12:3; 13:55-14:3; 21:49-22:12; 24:45-55; 34:4-15. Indeed, Challenged Claim 61 recites that the notification is related to policy enforcement. Thus, the Poh/Burnett system for notification and actions such as policy changes mirrors that of the '543 Patent. EX-1003, ¶¶288-289.

Thus, a POSA understood that the wireless end-user device is a portion of the network enforcement system because it receives notifications relating to the enforcement of the subscriber's service plan and provides the opportunity for the subscriber to change the service plan being enforced. EX-1003, ¶290.

Claim 47

> ***The network service plan provisioning system of claim 1, wherein the network policy enforcement system or the network traffic inspection system comprises a modem or an agent on the wireless end-user device.***

The combination discloses this limitation for the reasons in Claims 44 and 45. EX-1003, ¶¶291-293. Specifically, the combination discloses that end user device 134 can be a smart phone that uses various wireless access technologies to communicate with gateway 130. EX-1004 14:64-15:24, EX-1012, 3:62-67. EX-1003, ¶291. Burnett shows such a component:



EX-1012, Fig. 4, 9:53-10:15. Burnett's transceivers render obvious the claimed "modem." EX-1003, ¶292. Moreover, the claimed "agent" is rendered obvious by Burnett's "applications" (408) which include the "user feedback component software for accepting or declining update offers." EX-1012, 9:31-52. EX-1003, ¶292.

A POSA understood that the end user device would use a modem to communicate with the gateway using the wireless access technologies. EX-1003, ¶293; *see also* EX-1004 FIG. 10 (showing input/out 1004 through which ISGW 138 communicates); 22:50-53.

Claim 57

> ***The network service plan provisioning system of claim 1, wherein the network policy enforcement system comprises a notification element.***

Poh discloses several different notification functions. EX-1003, ¶¶294-299. For example, the PCRF (and/or PCEF) (*notification element*) includes a notification function that triggers messages and/or notifications to subscribers for events such as differential charges, or if the PCRF is triggered to treat the subscriber differently than the subscriber's expected treatment. EX-1004, 14:17-35. EX-1003, ¶295.

Poh further describes that the system is "further configured to trigger a notification to notify a subscriber that an action is to be taken. In some embodiments, the trigger is an online trigger. In some embodiments, the trigger is an offline trigger." EX-1004 8:61-65, 11:48-49, 14:25-35. A POSA understood that the purpose of sending a notification to a subscriber is to inform the subscriber of a change in how the subscriber was being treated and to afford the subscriber to an opportunity to change the subscriber preferences. EX-1003, ¶296. Poh describes that a subscriber can change preferences frequently, for example, disabling SMS. EX-1004 21:61-22:3. Another example is that the subscriber would be subject to an enhanced charge rate, which a POSA understood would be triggered by exceeding a specified threshold of resources, for accessing a service

not included in a service plan or accessing a higher priority service. A subscriber receiving the notification would have the opportunity to accept or deny the charges or change the current service plan. Any change in the subscriber policies would be reflected in new provisioning instructions. EX-1004, 14:25-35; EX-1003, ¶296.

Another notification function is that the ISGW (*notification element*) can send a notification of a security threat to network elements (*notification element*), and vice versa. EX-1004 9:22-28, 24:57-25:4. EX-1003, ¶297.

Burnett matches Poh in describing notifications sent from the "service personalization engine" to the "user feedback component software" on the mobile device. EX-1012, 5:24-47, 9:31-52, Figs. 1-5. EX-1003, ¶298.

Further, for the reasons in Claim 16, Poh as modified by Burnett, the PCRF/PCEF (*notification element*) provides a notification including a subscription offer update presenting an option to a subscriber to accept or decline a subscription update offer. EX-1003, ¶299.

Claim 58

> ***The network service plan provisioning system of claim 1, wherein the network policy enforcement system implements a notification function.***

The combination discloses this limitation for the reasons for Claim 57.

Claim 59

The network service plan provisioning system of claim 58, wherein the one or more network elements are further configured to:

obtain notification information, the notification information at least assisting to specify or identify a notification content, a notification trigger, or a notification offer; and

determine at least a portion of the policy enforcement provisioning instructions based on the notification information.

The combination discloses this limitation for the reasons for Claims 1, 16 and 57. The obtained *notification information* is any of Poh's received notifications such as the enhanced charge rate, dropped IP flow, and/or QoS change and the security threats (e.g., at the ISGW or other network element) and the *provisioning instructions* are triggered to provide the response (such as the QoS change, charge rate change or responding to the security threat to be blocked (*determine at least a portion of the policy enforcement provisioning instructions based on the notification information*). They also disclose providing *notification content* or a *notification offer* as discussed for Claim 16. EX-1004 14:25-35; EX-1003, ¶301.

<u>Claim 60</u>

The network service plan provisioning system of claim 1, wherein the one or more policies comprise a notification policy.

The combination discloses this limitation for the reasons for Claims 1, 16, and 57, where the MPR includes policies regarding notifying a subscriber that an

action is to be taken (*notification policies*), such as for differential charges, dropped IP flows or QoS changes. EX-1004 14:25-35; EX-1003, ¶302.

Claim 61

> ***The network service plan provisioning system of claim 60, wherein the one or more policy enforcement provisioning instructions assist in causing a notification to be delivered to a subscriber or to the wireless end-user device.***

The combination discloses this limitation for the reasons for Claims 1, 16, 57 and 60.

Claim 62

> ***The network service plan provisioning system of claim 61, wherein the notification comprises a selection option for providing feedback or instructions.***

The combination discloses this limitation for the reasons for Claims 1, 16, 57, 60 and 61, where the notification includes an enhanced charge rate and an opportunity to accept or deny it through subscriber plan changes. EX-1003, ¶304.

Claim 63

> ***The network service plan provisioning system of claim 61, wherein the notification indicates that a usage of a service plan has reached a particular percentage of a limit, or that a requested network activity has been capped because a policy limit has been reached.***

The combination discloses this limitation for the reasons in Claims 1, 16, 57, 60 and 61, where an enhanced charge rate is tied to exceeding a specified usage threshold of a service plan. EX-1004 14:17-35; EX-1003, ¶305.

Claim 64

> ***The network service plan provisioning system of claim 61, wherein the notification provides information about a service plan limit or an overage.***

The combination discloses this limitation for the reasons in Claim 63.

Claim 65

> ***The network service plan provisioning system of claim 61, wherein the notification provides information about an offer.***

The combination discloses this limitation for the reasons in Claims 1, 16 and 57, where the notification offers the subscriber the option to change the service plan. EX-1003, ¶307.

Claim 66

> ***The network service plan provisioning system of claim 65, wherein the offer is an offer to allow an overage, an offer for a new service plan, or an offer to block an ongoing usage.***

The combination discloses this limitation for the reasons in Claim 65.

Claim 68

> ***The network service plan provisioning system of claim 61, wherein the notification provides information about an activity of the wireless end-user device that has been blocked, or an activity of the wireless end-user device that is not allowed.***

The combination discloses this limitation for the reasons in Claim 57, where the notification is, for example, a dropped IP flow. EX-1004 14:25-35. EX-1003, ¶309.

Claim 69

> ***The network service plan provisioning system of claim 61, wherein the notification provides a message or an offer based on a current activity or a status of the wireless end-user device.***

The combination discloses this limitation for the reasons in Claims 1, 16, 57, 60 and 61. EX-1004, 14:17-35. EX-1003, ¶310.

Claim 70

> ***The network service plan provisioning system of claim 69, wherein the current activity or the status of the wireless end-user device is based on the traffic event.***

The combination discloses this limitation for the reasons in Claim 69.

Claim 71

> ***The network service plan provisioning system of claim 61, wherein the notification is an actionable notification enabling a user of the wireless end-user device to provide a response to the notification.***

The combination discloses this limitation for the reasons in Claims 1, 16, 57 and 60.

Claim 72

> ***The network service plan provisioning system of claim 71, wherein the response comprises a directive to dismiss the notification, a directive to cancel the notification, an***

acknowledgment of the notification, a request for information, or a request to make a purchase.

The combination discloses this limitation for the reasons in Claims 1, 16, 57, 60, 61 and 71.

Claim 80

The network service plan provisioning system of claim 61, wherein the notification comprises an upsell offer.

The combination discloses this limitation for the reasons in Claims 1, 16, 57 and 60.

Claim 85

The network service plan provisioning system of claim 61, wherein the notification comprises information about a purchase, a data usage, an application, an amount of data, a percentage, or a combination of these.

The combination discloses this limitation for the reasons in Claim 63.

Claim 86

The network service plan provisioning system of claim 61, wherein the notification comprises information to assist a subscriber in activating the wireless end-user device, selecting a service plan for the wireless end-user device, setting a preference, or a combination of these.

The combination discloses this limitation for the reasons in Claims 1, 16, 57 and 60.

VII. THE BOARD SHOULD NOT EXERCISE ITS DISCRETION AND DENY INSTITUTION

A. The Board Should Not Deny Institution Under 35 U.S.C. § 325

The examiner did not cite or apply Poh, Maes or Burnett (or any other prior art). Thus, the Board should not discretionarily deny institution under these circumstances.

B. The Board Should Not Deny Institution Under 35 U.S.C.§ 314(a)

The Board has discretion to deny institution under 35 U.S.C. § 314(a). Related to the Director's June 2022 interim guidance regarding application of the *Fintiv* factors[4], the Petition is particularly strong in the underlying merits. Thus, under the Interim Guidance, the Board should not deny institution.

Nevertheless, the Board's decision in *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (Dec. 1, 2020) instructs that a holistic view of the remaining *Fintiv* factors also weighs in favor of institution.

Factor 1 is neutral because no request for stay has been filed.

Under factor 2, trial date has been set for May 19, 2025. EX-1022. A Final Written Decision is expected in the present matter in November 2025. Considering

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[4] Interim Procedure For Discretionary Denials In AIA Post Grant Proceedings With Parallel District Court Litigation, PTO Director's Memorandum (June 21, 2022).

the uncertainties of litigation scheduling, particularly as here where multiple trials are scheduled for the same date, this factor weighs against discretionary denial.

Factor 3 favors institution. The co-pending litigation is in its early stages, and the investment in it has been minimal. The parties have not exchanged proposed claim terms or constructions, and will not complete claim construction briefing until September 2024. The Markman hearing is not until November 2024. Fact discovery is not set to close until December 2024, and expert discovery is not set to close until February 2025. *See PEAG LLC v. Varta Microbattery GMBH*, IPR2020-01214, Paper 8 at 17 (Jan. 6, 2021) (finding that since no claim construction hearing had yet been held and discovery was not completed, the little investment in the parallel proceeding weighed against discretionary denial). Thus, this factor weighs against discretionary denial.

Under factor 4, there will not be complete overlap in the issues raised in the IPR and the Related Litigation and this favors institution. PO asserted 71 claims from the '543 patent and *300+* claims from four patents in the Related Litigations (EX-1014) – an amount that far exceeds the number of claims that the district court will allow at trial. See https://txed.uscourts.gov/?q=model-order-focusing-patent-claims-and-prior-art-reduce-costs. (Model Order limiting patentees to a "Final Election of Asserted Claims, which shall identify no more than five asserted claims per patent … and no more than a total of 16 claims"). Thus, it is extremely unlikely

the district court addresses the validity of all 71 asserted claims of the ’543 challenged in this Petition and its companion Petition.

Under factor 5, Petitioners are defendants in the Related Litigations. This factor is neutral as it is “far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same.” *See Sand Revolution II LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 12-13 (PTAB June 16, 2020).

To the extent that the Board finds that factors 1-5 favor discretionary denial, under factor 6, other circumstances weigh in favor of institution. Here, the merits of the Petition are particularly strong and the claims did not receive any analysis during prosecution. For example, as detailed above, the Challenged Claims recite merely the use of well-known structural components to implement well-known policies to arrive at well-known outcomes. The Challenged Claims recite nothing that is novel or non-obvious—thus demonstrating that the Petition is particularly strong in the merits. This evidence, if unrebutted, shows that it is highly likely that the Petitioners would succeed in demonstrating the unpatentability of at least one claim.

When viewed holistically, the timing of the present Petition is reasonable, there has been relatively limited investment in the Related Litigation, and there is minimal overlap between the present IPR and the Related Litigation. Further,

coupling these *Fintiv* considerations with compelling evidence of unpatentability presented in the Petition, the efficiency and integrity of the IPR process is best served by instituting review.

VIII. Mandatory Notices Under 37 C.F.R. §42.8

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

The real party-in-interest in this Petition is Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Services Group Inc., T-Mobile USA, Inc., AT&T Services, Inc., AT&T Mobility LLC, and AT&T Corp.[5]

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[5] Out of an abundance of caution, Petitioners identify all current defendants in the below identified cases as potential real parties in interest only for the purpose of this proceeding and only to the extent that Patent Owner contends that these separate legal entities should be named real parties in interest in this IPR. Petitioners do so to avoid the potential expenditure of resources to resolve such a challenge. Petitioners also acknowledge that each petitioner has a number of affiliates. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this Petition or Petitioners' participation in any resulting IPR. Petitioners are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. § 315(e).

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

1. Judicial Matters

As of the filing date of this Petition and to the best knowledge of Petitioners, the '543 Patent is involved in the following litigations (the "Related Litigations"):

- *Headwater Research LLC v Verizon Communications Inc.*, *et al*, Case No. 2:23-cv-00352-JRG-RSP (EDTX);
- *Headwater Research LLC v AT&T Inc.*, *et al,* Case No. 2:23-cv-00398-JRG-RSP (EDTX);
- *Headwater Research LLC v T-Mobile US, Inc., et al*, Case No. 2:23-cv-00379-JRG-RSP (EDTX);

Administrative Matters:

As of the filing date of this Petition and to the best knowledge of Petitioners, the '543 Patent has not been subject to any Petitions for *inter partes* reviews.

2. Related Patents

See Exhibit 1013.

C. Lead/Back-up Counsel (37 C.F.R. § 42.8(b)(3)):

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D. Notice of Service Information (37 C.F.R. § 42.8(b)(4)):

Please direct all correspondence to lead and back-up counsel at the above addresses. Petitioners consent to electronic service at the email addresses above.

IX. Conclusion

Petitioners request the Board institute IPR and cancel all Challenged Claims as unpatentable.

Respectfully submitted,

BY: /Kevin P. Anderson/
Kevin P. Anderson
USPTO Reg. No. 43,471
Duane Morris LLP

Dated:

June 20, 2024

CERTIFICATION OF SERVICE ON PATENT OWNER

Pursuant to 37 C.F.R. §§ 42.6(e), 42.8(b)(4) and 42.105, the undersigned certifies that on the 20th of June, 2024, a complete and entire copy of this Petition for *Inter Partes* Review of U.S. Patent No. 8,924,543 and all supporting exhibits were served by electronic means by agreement with Patent Owner to:

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24 *et seq*., the undersigned certifies that this document complies with the type-volume limitations. This document contains 13,985 words as calculated by the "Word Count" feature of Microsoft Word 2010, the word processing program used to create it.

Dated: June 20, 2024

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