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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MEGHASHREE KEDALAGUDDE, CHEN-HO CHIN, and
MUTHAIAH VENKATACHALAM

Appeal 2019-002546
Application 14/778,983
Technology Center 2400

Before MICHAEL J. STRAUSS, JEREMY J. CURCURI, and
JAMES B. ARPIN, *Administrative Patent Judges*.

CURCURI, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 26, 28–40, 43–47, and 50. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

¹ Appellant refers to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party-in-interest as Intel IP Corporation. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to “Diameter/Extensible Markup Language (XML) protocol conversion.” Spec. 1:9–10. Claim 26, reproduced below, is illustrative of the claimed subject matter:

26. A protocol converter (PC), comprising:

one or more communication interfaces to receive Extensible Markup Language (XML) data transmitted by an Application Function (AF) and to provide a Diameter Protocol (DP) message for transmission to a Policy and Charging Rules Function (PCRF), the PCRF disposed in a Diameter realm; and

conversion logic to convert the XML data into the DP message,

wherein the PC is to operate separately from the PCRF but within the Diameter realm in which the PCRF is disposed and an interface of the one or more communication interfaces is to provide the DP message for transmission to the PCRF through a diameter routing agent (DRA) that is communicatively coupled with the plurality of PCRFs including the PCRF.

REFERENCES

The Examiner relies upon the following references:

Name	Reference	Date
Brunner	US 5,771,275	Jun. 23, 1998
Maeng	US 2010/0284398 A1	Nov. 11, 2010
Yigang	US 2010/0299451 A1	Nov. 25, 2010
McCann	US 2011/0126277 A1	May 26, 2011
Yeung	US 2011/0202635 A1	Aug. 18, 2011
Gonzalez De Langarica (“Langarica”)	US 2013/0170386 A1	Jul. 4, 2013
Vihtari	US 2013/0322448 A1	Dec. 5, 2013

REJECTIONS

Claims 26 and 32 are rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung and Vihtari. Final Act. 4–7.

Claims 28, 29, and 33 are rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Vihtari, and McCann. *Id.* at 7–9.

Claim 30 is rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Vihtari, McCann, and Maeng. *Id.* at 10.

Claim 31 is rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Vihtari, and Brunner. *Id.* at 10–12.

Claims 34, 39, and 43 are rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung and Yigang. *Id.* at 12–14.

Claims 35, 37, 38, 45, and 50 are rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Yigang, and McCann. *Id.* at 15–18.

Claim 36 is rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Yigang, McCann, and Langarica. *Id.* at 18–19.

Claims 40 and 44 are rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Yigang, and Vihtari. *Id.* at 19–21.

Claim 46 is rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Yigang, McCann, and Vihtari. *Id.* at 21–22.

Claim 47 is rejected under 35 U.S.C. § 103 as obvious over the combined teachings of Yeung, Yigang, McCann, Vihtari, and Maeng. *Id.* at 22–23.

OPINION

Obviousness of Claims 26 and 32 over Yeung and Vihtari

The Examiner finds Yeung and Vihtari teach or suggest all of the limitations of claim 26. Final Act. 4–6; *see also* Ans. 4–6, Drawing Fig. 8. The Examiner finds Yeung teaches or suggests most limitations of claim 26. *See* Final Act. 4–5; *see also* Yeung, Fig. 2. The Examiner finds Vihtari teaches or suggests “an interface of the one or more communication interfaces is to provide the DP message for transmission to the PCRF through a diameter routing agent (DRA) that is communicatively coupled with the plurality of PCRFs including the PCRF” as recited in claim 26. Final Act. 5; *see also* Vihtari, Fig. 1. The Examiner reasons

it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to combine [] Yeung’s teachings of using Diameter format to allow easier changing of dynamic policing and charging rules for a user’s interaction with an application and Vihtari’s teaching of using spoofed message to enable backward compatib[ility].

Final Act. 6.

Appellant presents the following principal argument:

As can be seen from Figure 2 of Yeung, the API 40 is part of the PCRF 26. And, from Figure 1 of Vihtari, the DRA 142 is coupled with multiple PCRBs 144, 146. Combining these teachings of Yeung and Vihtari would not result in a PC as recited in claim 26. Rather, the combination would result in each of the PCRBs 144, 146 of Vihtari being configured with an API 40 of Yeung.

Appeal Br. 8; *see also* Reply Br. 2 (“[E]xtracting Yeung’s API 40 from the PCRF 26 and placing it in a distinct device that resides somewhere between [] Vihtari’s AF 160 and DRA 142, is simply not taught or suggested by the art.”).

We are not persuaded of reversible error in the Examiner’s findings. We concur with the Examiner’s conclusion of obviousness.

Figure 2 of Yeung depicts API 40 as a part of PCRF 26. Yeung, Fig. 2. Thus, on its face, Yeung does not describe “an interface . . . to provide the DP message for transmission to the PCRF *through a diameter routing agent (DRA)* that is communicatively coupled with the plurality of PCRFs including the PCRF” (claim 26 (emphasis added)) as recited in claim 26.

However, Figure 1 of Vihtari depicts a diameter routing agent (DRA). Vihtari, Fig. 1.

We determine a skilled artisan, in light of Vihtari’s teaching of a diameter routing agent (DRA), would have had reason to modify Yeung’s teachings to utilize a diameter routing agent (DRA) and, thereby, allow API 40 (protocol converter) to operate separately from a plurality of PCRFs. *See* Yeung Fig. 2, Vihtari Fig. 1. We do not agree that the combination would result in an API at each PCRF. *See* Appeal Br. 8, Reply Br. 2.

The Examiner has articulated a reason to combine the references that is rational with sufficient underpinnings to justify a legal conclusion of obviousness. *See* Final Act. 6 (“to enable backward compatib[ility]”).

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary

skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida* [v. *Ag Pro, Inc.*, 425 U.S. 273 (1976)] and *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57 (1969)] are illustrative—a court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

KSR Int'l Co. v. Teleflex, Inc., 550 U.S. 398, 417 (2007).

Vihtari's diameter routing agent (DRA) is readily-applicable to Yeung's PCRF because Yeung's API 40 includes diameter client 48. In short, modifying Yeung's teachings to utilize a diameter routing agent (DRA) and, thereby, allow API 40 (protocol converter) to operate separately from a plurality of PCRFs would have been a predictable use of prior art elements according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

Because Appellant has not demonstrated that the Examiner's proffered combination would have been “uniquely challenging or difficult for one of ordinary skill in the art,” we agree with the Examiner that the proposed modification would have been within the purview of the ordinarily skilled artisan. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418).

We, therefore, sustain the Examiner's rejection of claim 26. We also sustain the Examiner's rejection of claim 32, which is not separately argued with particularity.

Obviousness of Claims 28, 29, and 33 over Yeung, Vihtari, and McCann

Claim 28 further recites

wherein the XML data includes an Attribute Value Pair (AVP) element, and the AVP element includes an AVP-Parameters element including a first XML element representative of an AVP code, a second XML element representative of an AVP flag, and a third XML element representative of an AVP length.

The Examiner finds Yeung and McCann teach the further recited subject matter in claim 28. Final Act. 7–8 (citing Yeung ¶ 27, McCann ¶ 92); *see also* Ans. 7.

Appellant presents the following principal argument:

The Action relies on paragraph 92 of McCann for the above-quoted recitations of claim 28. However, this paragraph only describes that “Diameter information may include . . . an AVP parameter, an AVP code, an AVP flag, an AVP length . . .”

This is with respect to the Diameter message. There is no teaching that the XML data includes an AVP parameter, much less is there a teaching that XML data includes an AVP parameter with the elements specifically recited in claim 28.

Appeal Br. 9; *see also* Reply Br. 3.

We are not persuaded of reversible error in the Examiner’s findings. We concur with the Examiner’s conclusion of obviousness.

Yeung discloses “API 40 provides support for Diameter in XML template format . . . XML messages may be modified at step 64 above by adding or modifying AVPs.” Yeung ¶ 27. Thus, Yeung teaches “wherein the XML data includes an Attribute Value Pair (AVP) element,” as recited in claim 28. McCann discloses “an AVP parameter, an AVP code, an AVP flag, an AVP length.” McCann ¶ 92. We recognize that McCann is describing a Diameter message. However, the Examiner does not rely on

McCann alone for teaching the subject matter of claim 28; the Examiner relies on the combined teachings of Yeung and McCann.

We determine a skilled artisan, in light of McCann’s teaching of an AVP parameter, an AVP code, an AVP flag, and an AVP length, would have had reason to modify Yeung’s XML data to include an AVP parameters element, including an AVP code element, an AVP flag element, and an AVP length element. *See* Yeung ¶ 27, McCann ¶ 92. The Examiner has articulated a reason to combine the references that is rational and sufficient to support the combination. *See* Final Act. 8 (“to enforce security policies and rules to mitigate denial of service (DoS) attacks or other security issues”). In short, we determine the arrangement of XML elements recited in claim 28 would have been a predictable use of prior art elements according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417.

We, therefore, sustain the Examiner’s rejection of claim 28. We also sustain the Examiner’s rejection of claims 29 and 33, which are not separately argued with particularity.

Obviousness of Claim 30 over Yeung, Vihtari, McCann, and Maeng

Claim 30 further recites “wherein the AVP-Parameters element is included in the AVP element by a reference attribute in the XML schema.” The Examiner finds Maeng teaches the further recited subject matter in claim 30. Final Act. 10 (citing Maeng ¶ 92); *see also* Ans. 7–8 (“Maeng is brought in to remedy the deficiency of Yeung and McCann to teach the AVP parameters element by a reference attribute in the XML schema.”).

Appellant presents the following principal argument: “[The cited] portion of Maeng provides an XML structure of a media capability information element. While it does reference ‘AVP,’ it is not an Attribute

Value Pair - Parameters element.” Appeal Br. 9; *see also* Reply Br. 3 (“Without teaching an AVP parameter element, it is impossible for Maeng to describe including one by a reference attribute.”). We are persuaded the Examiner errs in rejecting claim 30.

Maeng discloses a MediacapabilityInfo element. *See* Maeng ¶ 92. We do not see a teaching of “a reference attribute in the XML schema,” as recited in claim 28, because the cited portion of Maeng describes an XML document, and does not describe an XML schema, which describes the structure of an XML document. *See* Maeng ¶ 92.

We, therefore, do not sustain the Examiner’s rejection of claim 30.

Obviousness of Claims 34, 39, and 43 over Yeung and Yigang

The Examiner finds Yeung and Yigang teach or suggest all of the limitations of claim 34. Final Act. 12–13; *see also* Ans. 6, Drawing Fig. 11. The Examiner finds Yeung teaches or suggests most limitations of claim 34. Final Act. 12–13; *see also* Yeung Fig. 2. The Examiner finds Yigang teaches or suggests “the computing device is configured to operate within a public land mobile network (PLMN) and outside of the Diameter realm,” as recited in claim 34. Final Act. 13 (citing Yigang ¶¶ 22–23). The Examiner reasons “it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to combine the teaching of Yeung and Yigang to enable Diameter servers to improve the effective traffic management.” Final Act. 13.

Appellant presents the following principal argument:

Paragraphs 22 and 23 of Yigang describe a media gateway (MGW) that “operates as an interface for bearer path transfer between the network 2 and other networks.” *Yigang*, paragraph 23. The undersigned can find [no] discussion that the MGW

operates within a PLMN but outside of a Diameter realm in which the PCRF operates. Furthermore, even if Yigang provided such a teaching, there is still no teaching or suggestion that a disposition of the MGW of Yigang instructs a similar disposition of the API of Yeung. In fact, as discussed above, there is no teaching or suggestion that the API of Yeung is even to be disposed separately from the PCRF itself. Providing a teaching of a completely different device, associated with completely different functions, being disposed separately from a PCRF is simply irrelevant.

Appeal Br. 11; *see also* Reply Br. 2 (“It appears that the Examiner is simply providing one device that is disposed outside of a particular Diameter realm.”).

We are not persuaded of reversible error in the Examiner’s findings. We concur with the Examiner’s conclusion of obviousness.

Figure 2 of Yeung depicts API 40 as a part of PCRF 26. Yeung, Fig. 2. Thus, on its face, Yeung does not describe “the computing device is configured to operate *within a public land mobile network (PLMN) and outside of the Diameter realm*” (claim 34 (emphasis added)), as recited in claim 34.

However, Figure 1 of Yigang depicts “the servers of the cluster 30 implement services related to telecommunications, and thus provides various hardware and/or software network elements including . . . media gateway (MGW).” Yigang ¶ 21. Yigang discloses “[t]he MGW operates as an interface for bearer path transfer between the network 2 and other networks (e.g., PSTN, not shown), and provides resources for *translation and encoding, transcoding, compression, packetizing, depacketizing, etc.* with respect to bearer path traffic.” Yigang ¶ 23 (emphasis added). Appellant does not direct our attention to nor do we ascertain a definition in the

Specification or elsewhere of the term “realm,” as recited by the disputed limitation. In the absence of any special meaning attributable to the term, we find Yigang’s Figure 1 further depicts server cluster 30 (realm) operating outside of a realm where clients 11–14 reside. *See* Yigang, Fig. 1; *see also In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (during examination of a patent application, pending claims are given their broadest reasonable construction consistent with the specification).

The Examiner has articulated a reason to combine the references that is rational. *See* Final Act. 6 (“to enable Diameter servers to improve the effective traffic management”). In short, we determine the arrangement of the computing device (protocol converter) operating within a public land mobile network (PLMN) and outside of the Diameter realm would have been a predictable use of prior art elements according to their established functions—an obvious improvement. *See KSR*, 550 U.S. at 417. We determine a skilled artisan, in light of Yigang’s teaching of a Diameter server cluster 30 implementing the media gateway (MGW) which provides translation (conversion) and operates outside of the Diameter realm where the Diameter clients 11–14 reside (*see* Yigang, Fig.1), would have had reason to modify Yeung to configure the computing device (protocol converter) “to operate within a public land mobile network (PLMN) and outside of the Diameter realm,” as recited in claim 34.

Furthermore, we note in passing and without reliance in arriving at our decision, making elements of a device (Yeung’s PCRF 26 including API 40) separable, in the absence of evidence to the contrary, has been held to be an obvious design choice and does not render an invention patentable.

See In re Larson, 340 F.2d 965, 968 (CCPA 1965); *In re Dulberg*, 289 F.2d 522, 523 (CCPA 1961); MPEP § 2144.04(V)(C).

We, therefore, sustain the Examiner's rejection of claim 34. We also sustain the Examiner's rejection of claims 39 and 43, which are not separately argued with particularity.

The Remaining Rejections

Appellant does not present arguments for the remaining grounds of rejection. We, therefore, sustain the Examiner's rejection of claim 31 as obvious over the combined teachings of Yeung, Vihtari, and Brunner; the Examiner's rejection of claims 35, 37, 38, 45, and 50 as obvious over the combined teachings of Yeung, Yigang, and McCann; the Examiner's rejection of claim 36 as obvious over the combined teachings of Yeung, Yigang, McCann, and Langarica; the Examiner's rejection of claims 40 and 44 as obvious over the combined teachings of Yeung, Yigang, and Vihtari; the Examiner's rejection of claim 46 as obvious over the combined teachings of Yeung, Yigang, McCann, and Vihtari; and the Examiner's rejection of claim 47 as obvious over the combined teachings of Yeung, Yigang, McCann, Vihtari, and Maeng.

CONCLUSION

The Examiner's decision to reject claims 26, 28–40, 43–47, and 50 is affirmed in part.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
26, 32	103	Yeung, Vihtari	26, 32	
28, 29, 33	103	Yeung, Vihtari, McCann	28, 29, 33	
30	103	Yeung, Vihtari, McCann, Maeng		30
31	103	Yeung, Vihtari, Brunner	31	
34, 39, 43	103	Yeung, Yigang	34, 39, 43	
35, 37, 38, 45, 50	103	Yeung, Yigang, McCann	35, 37, 38, 45, 50	
36	103	Yeung, Yigang, McCann, Langarica	36	
40, 44	103	Yeung, Yigang, Vihtari	40, 44	
46	103	Yeung, Yigang, McCann, Vihtari	46	
47	103	Yeung, Yigang, McCann, Vihtari, Maeng	47	
Overall Outcome			26, 28, 29, 31–40, 43–47, 50	30

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART