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US	61/833,555 (CON)	
Filed on	11 June 2013 (11.06.2013)	
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- (71) Applicant: **NEW VAD, LLC** [US/US]; 131 Cheshire Lane, Suite 500, Minnetonka, MN 55305 (US).
- (72) Inventors: **WALL, Tim**; 16638 223rd Ave. NW, Big Lake, MN 55309 (US). **HOLSCHBACH, Roger**; 12700 Tippecanoe St. NE, Blaine, MN 55449 (US).
- (74) Agents: **EVANS, James, C.** et al.; Beck & Tysver, P.L.L.C., 2900 Thomas Ave. S., Suite 100, Minneapolis, MN 55416 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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[Continued on next page]

(54) Title: BIDIRECTIONAL TRANSCEIVERS USING OPPORTUNISTIC SEQUENCING

(57) Abstract: A bidirectional transceiver includes a media transmitter, a media receiver, a network transmitter, and a network receiver. Each of these components includes an interface to a respective differential wire pair of a cable. By coupling a pair of such transceivers, a media stream and network connectivity can be sent over the cable in either or both directions. Using an opportunistic scheduling method, each media stream can contain audio, video, and control information in uncompressed form. Power can be transferred over the cable so that a media device containing one transceiver can be powered by a media device containing the other transceiver.

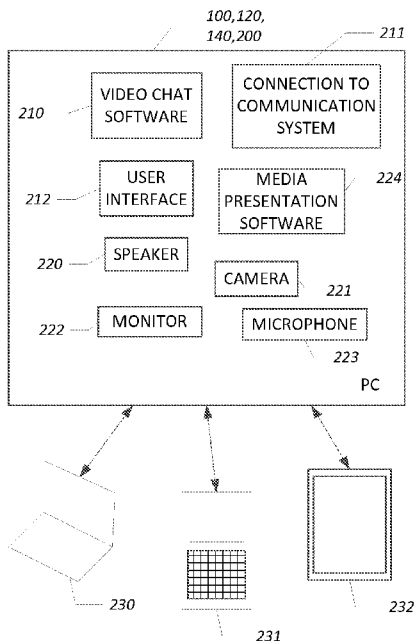


FIG. 2a

WO 2014/200628 A3

TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 14/36482

A. CLASSIFICATION OF SUBJECT MATTER
 IPC(8) - H04L 12/02 (2014.01) -
 CPC - H04L 65/1013
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 IPC(8): H04L 12/02 (2014.01); CPC: H04L 65/1013; USPC: 370/463

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 USPC: 370/464; IPC(8): H04L*; H04L65/10, H04L5/14, H04L 12/28, Y10S 370/902, H04L* (2014.01)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 PatBase (ALL); Google (Patents, Scholar, Web)
 Search Terms: Transceiver, receiver, bidirectional, Media, transmitter, Cable?, wire?, Interface, GUI, Wire, pair, Differential, Network, transmitter, Media, receiver, Network, first, Serdes, encoding, CAT, 5, 6, 7, Power, supply, Video, source?, Audio, Input, format*, logic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	US 2007/0143811 A1 (Powell) 21 June 2007 (21.06.2007), entire document, especially FIG. 1, para. [0019]	1-2, 5-9, 21 ----- 3, 4, 10, 11
Y --- A	US 2003/0196208 A1 (Jacobson) 16 October 2003 (16.10.2003), FIG. 1, para. [0042]-[0044], [0064]	1-2, 5-9, 21 ----- 10, 11
Y --- A	US 2004/0160971 A1 (Krause et al.) 19 August 2004 (19.08.2004), entire document, especially para. [0022], [0026]-[0027], [0029], [0030], [0034]	5-9, 12-20 ----- 10, 11
Y	US 5,550,589 A (Shiojiri et al.) 27 August 1996 (27.08.1996), abstract, col. 3, ln. 34-41, claim 1	12-20
A	US 5,579,336 A (Fitzgerald et al.) 26 November 1996 (26.11.1996), entire document, especially col 1, ln 8 - col 3, ln 65	1-21
A	US 2004/0041902 A1 (Washington) 04 March 2004 (04.03.2004), entire document, especially para [0045]-[0050]	1-21
A	US 2006/0209892 A1 (MacMullan et al.) 21 September 2006 (21.09.2006), entire document, especially para [0059]-[0084]	1-21
A	US 7,912,045 B2 (Page) 22 March 2011 (22.03.2011), entire document, especially abstract	1-21
A	US 5,253,249 A (Fitzgerald et al.) 12 October 1993 (12.10.1993), entire document	1-21

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 29 October 2014 (29.10.2014)	Date of mailing of the international search report 13 NOV 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 14/36482

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 14/36482

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-11 and 21 drawn to a system and corresponding method, comprising media receiver/transmitter or transceiver sets and at least three differential wire pairs of a cable.

Group II: Claims 12-15 drawn to a media transmitter apparatus, comprising: a video source interface and an audio source interface; logic that reformats a video stream, and logic that reformats an audio stream; packetizer logic, which creates packets from the first audio stream and the first video stream; input adaptive rate multiplexer logic; a cable interface; and transport logic, which encodes the first media stream into a second media stream.

Group III: Claims 16-20 drawn to a system, comprising: a media receiver apparatus, including a cable interface; transport logic, which receives a first media stream through the cable interface, and decodes the first media stream into a second media stream; output adaptive rate multiplexer logic, which removes packets from the second media stream; depacketizer logic; reclocker logic, which synchronizes the audio and video; and output formatter logic.

The inventions listed as Groups I through III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups II-III do not require media receiver/transmitter or transceiver sets and at least three differential wire pairs of a cable, as required by group I.

Groups I and III do not require a video and an audio source interface, logic for reformatting, packetizer logic; transport logic for encoding, as required by group II.

Group I-II do not require transport logic for decoding, output adaptive rate multiplexer logic, depacketizer logic, and reclocker logic, as required by group III.

The only feature shared by Groups I through III that would otherwise unify the groups, is the media transmitter/receiver having a cable interface. However, this shared technical feature does not represent a contribution over prior art, because the shared technical feature is anticipated by US 2003/0196208 A1 to Jacobson, entitled "Audio/video distribution system", published 16 October 2003 (16.10.2003), which teaches a media transmitter/receiver having a cable interface (abstract, FIG. 1, para. [0042]-[0044]). As the technical feature was known in the art at the time of the invention, this cannot be considered a special technical feature that would otherwise unify the groups.

Groups I through III therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.