IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION

MAXELL, LTD., Plaintiff, v. SAMSUNG ELECTRONICS CO., LTD., and SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Civil Action No. 5:25-cv-00052-RWS

DEFENDANTS' P.R. 3-3 AND 3-4 INVALIDITY CONTENTIONS AND DISCLOSURES

TABLE OF CONTENTS

Page

I. PRELIMINARY MATTERS 2

A. Incorporation by Reference of Related Invalidity Contentions and Disclosures 3

B. Ongoing Investigation 4

II. DISCLOSURES PURSUANT TO P.R. 3-3 5

A. Disclosures Pursuant to P.R. 3-3(a) 5

1. Prior Art Patents and Published Patent Applications 5

a. ’088 Patent 5

b. ’650 Patent 6

c. ’417 Patent 6

d. ’198 Patent 6

e. ’091 Patent 7

f. ’645 Patent 8

g. ’950 Patent 8

h. ’228 Patent 9

i. ’646 Patent 10

j. ’681 Patent 11

2. Prior Art Non-Patent Publications 11

a. ’088 Patent 12

b. ’650 Patent 13

c. ’198 Patent 16

d. ’091 Patent 17

e. ’645 Patent 20

f. ’950 Patent 20

g. ’228 Patent 22

h. ’646 Patent 22

i. ’681 Patent 32

3. Items Offered for Sale or Publicly Used or Known 32

a. ’088 Patent 32

b. ’650 Patent 32

c. ’417 Patent 33

d. ’198 Patent 33
e. ’091 Patent 33
f. ’645 Patent 34
g. ’950 Patent 34
h. ’228 Patent 34
i. ’646 Patent 34
j. ’681 Patent 35
B. Disclosures Pursuant to P.R. 3-3(b) 35
1. Anticipation 36
a. ’088 Patent 37
b. ’650 Patent 37
c. ’198 Patent 37
d. ’091 Patent 38
e. ’645 Patent 38
f. ’228 Patent 39
g. ’646 Patent 39
h. ’681 Patent 39
2. Some Asserted Claims Are Not Entitled to the Claimed Priority Dates 40
a. ’091 Patent 40
b. ’650 Patent 41
3. Obviousness 52
a. Obviousness Combinations 57
b. Specific Motivations to Combine 68
C. Disclosures Pursuant to P.R. 3-3(c) 168
D. Disclosures Pursuant to P.R. 3-3(d) 171
1. Written Description and Enablement Under 35 U.S.C. § 112(1) (pre-AIA Patents-In-Suit) and/or 35 U.S.C. § 112(a) (AIA Patents-In-Suit) 172
a. ’088 Patent 173
b. ’650 Patent 173
c. ’417 Patent 175
d. ’198 Patent 175

Maxell, Ltd.
Ex. 2015
IPR2025-01313
3 of 191

e. ’091 Patent 176
f. ’645 Patent 180
g. ’228 Patent 180
h. ’681 Patent 182
III. DISCLOSURES PURSUANT TO P.R. 3-4 184

Maxell, Ltd.
Ex. 2015
IPR2025-01313
4 of 191

Pursuant to Rules 3-3 and 3-4 of the Patent Local Rules for the Eastern District of Texas and the Court's Docket Control Order (Docket No. 44), Defendants Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively referred to herein as "Samsung" or "Defendants"), submit the following Invalidity Contentions to Plaintiff Maxell, Ltd. ("Maxell").

The Invalidity Contentions address the following claims of U.S. Patent Nos. 11,026,088 (the "'088 patent"), 11,277,650 (the "'650 patent"), 7,577,417 (the "'417 patent"), 8,180,198 (the "'198 patent"), 11,812,091 (the "'091 patent"), 7,952,645 (the "'645 patent"), 8,471,950 (the "'950 patent"), 10,783,228 (the "'228 patent"), 10,812,646 (the "'646 patent") and 12,160,681 (the "'681 patent") (collectively, the "Patents-in-Suit"), which are alleged by Maxell to be infringed by Defendants in Maxell's Disclosure of Asserted Claims and Infringement Contentions ("Infringement Contentions"):

Asserted Patent No.	**Asserted Claims**
11,026,088	1, 14
11,277,650	1, 4
7,577,417	1-3, 7
8,180,198	1, 4
11,812,091	1-3, 6, 7, 10, 13-17, 20
7,952,645	1-8
8,471,950	1-5, 7, 8, 10, 12, 14
10,783,228	1-2, 4-9
10,812,646	1-8, 11
12,160,681	1-5, 7

Maxell's Infringement Contentions are deemed to be its final contentions pursuant to Patent Local Rule 3-6. Should the Court allow Maxell to later assert infringement of additional claims not asserted in Maxell's Infringement Contentions or additional infringement theories with respect to the Asserted Claims, Defendants reserve the right to supplement their Invalidity Contentions to assert invalidity of those additional claims and/or to assert invalidity based on the additional infringement theories. Defendants also reserve the right to supplement their Invalidity

Maxell, Ltd.
Ex. 2015
IPR2025-01313
5 of 191

Contentions in response to information learned in fact or expert discovery, including identification of additional prior art.

I. PRELIMINARY MATTERS

Defendants' Invalidity Contentions are based in whole or in part on their present understanding of the Asserted Claims and Maxell's Infringement Contentions, including the priority dates of each of the Patents-in-Suit as asserted by Maxell in its Infringement Contentions.

Defendants' Invalidity Contentions are responsive at least to the same level of specificity of Maxell's Infringement Contentions. Defendants' Invalidity Contentions may also take into account Maxell's apparent claim constructions, to the extent Maxell's constructions can be gleaned from its Infringement Contentions. Such apparent constructions may be inconsistent with the constructions that Defendants ultimately will proffer in this case. By including prior art that would anticipate or render obvious the Asserted Claims of the Patents-in-Suit based on Maxell's disclosed and apparent claim constructions, or based on any other particular claim construction, Defendants are not adopting Maxell's claim constructions, nor are Defendants admitting to the accuracy of any particular claim construction. The Court has established separate deadlines for the parties' proposed claim constructions, and Defendants will disclose their proposed constructions according to those deadlines. Solely for purpose of these Invalidity Contentions, Defendants may, if necessary, apply alternative, and even inconsistent, claim construction positions. Defendants reserve all rights to amend these Invalidity Contentions after the Court issues its claim construction ruling, or if the Court permits Maxell to amend its Infringement Contentions.

Defendants do not concede that Maxell's Infringement Contentions meet the specificity required under the Patent Rules, and Defendants provide these Invalidity Contentions without

Maxell, Ltd.
Ex. 2015
IPR2025-01313
6 of 191

waiving any right to receive from Maxell full and complete specific infringement contentions. Moreover, nothing in these disclosures admits in any way that any accused product, or any of Defendants' other products, infringes any of the Asserted Claims. Defendants have served, or are in the process of serving, subpoenas and/or letters rogatory on third parties in possession of information regarding prior art disclosed herein. Defendants reserve the right to supplement these contentions in view of any responsive documents, source code, or information produced by those third parties.

A. Incorporation by Reference of Related Invalidity Contentions and Disclosures

Defendants incorporate by reference all contentions, charts, prior art references, and other statements relating to any ground of invalidity identified by any potential or actual licensee to the Patents-in-Suit and by any party in any other past, present, and future litigation involving the Patents-in-Suit and patents related to the Patents-in-Suit, including, but not limited to, the litigation titled *Certain Smart Televisions*, Inv. No. 337-TA-1338 (U.S.I.T.C.), *Certain Mobile Electronic Devices*, Inv. No. 337-TA-1324 (U.S.I.T.C.), *Certain Mobile Electronic Devices*, Inv. No. 337-TA-1312 (U.S.I.T.C.), *VIZIO, Inc. v. Maxell Ltd.*, IPR2023-00316 (P.T.A.B.), *Motorola Mobility LLC v. Maxell, Ltd.*, IPR2022-001348 (P.T.A.B.), *Maxell, Ltd. v. Lenovo Group Ltd.*, No. 6-22-cv-00334 (W.D. Tex.), *BlackBerry Corp. v. Maxell Ltd.*, IPR2019-00089 (P.T.A.B.), *Maxell, Ltd. v. BlackBerry Corp.*, No. 1-17-cv-01446 (D. Del.), *Certain Smart Televisions*, 337-TA-1420 (U.S.I.T.C.), *Maxell Ltd. v. TCL Electronics Holdings Ltd.*, No. 5-25-cv-00067 (E.D. Tex.), *Motorola Mobility LLC v. Maxell Ltd.*, No. 1-22-cv-00256 (N.D. Ill.), *Maxell Ltd. v. Lenovo Group Ltd.*, No. 6-21-cv-01169 (W.D. Tex.). Defendants incorporate by reference all grounds of invalidity identified in any present or future reexamination, *inter partes* review, covered business method (CBM) patent review, or other post-issuance review of the Patents-in-

Maxell, Ltd.
Ex. 2015
IPR2025-01313
7 of 191

Suit, including but not limited to IPR2025-01307 through IPR2025-01316, filed by Samsung against the Patents-in-Suit. Defendants also incorporate by reference the production of documents associated with any grounds for invalidity for the Patents-in-Suit identified in this paragraph. Defendants also incorporate any grounds of invalidity known to Maxell or any affiliated party whether or not disclosed.

Defendants have requested that Maxell produce all such contentions, prior art, and related documents and communications, including from every case involving the Patents-in-Suit, as soon as they are served on, or become known to, Maxell. Defendants also requested that Maxell produce all prior art to the Patents-in-Suit of which it is aware.

B. Ongoing Investigation

Defendants' discovery and investigation in connection with this lawsuit is continuing. These Invalidity Contentions are based on information obtained to date. Among other things, discovery is still underway, witnesses remain to be deposed, and the Court has not yet construed the terms of the Asserted Claims. Accordingly, Defendants' Invalidity Contentions are subject to modification, amendment, or supplementation in accordance with the Court's Docket Control Order, the Local and Patent Rules of the Eastern District of Texas, and/or the Federal Rules of Civil Procedure as this action progresses and additional information is obtained.

Defendants reserve the right to challenge the priority date of the Asserted Patents, as well as the right to assert invalidity under 35 U.S.C. §§ 102(f) or (g) subject to further discovery and investigation including identification of evidence that may be relevant to an invalidity defense under the sections above.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
8 of 191

II. DISCLOSURES PURSUANT TO P.R. 3-3

A. Disclosures Pursuant to P.R. 3-3(a)

Defendants identify the following prior art to the Patents-in-Suit. Defendants contend that the prior art disclosed below generally relate to the subject matter of the respective Patents-in-Suit for which they are cited, and collectively they are all relevant at least as background art to each of the respective Patents-in-Suit. Defendants expressly reserve the right to at least use and rely on any of the prior art cited herein to establish or otherwise support Defendants' contentions as to what was known in the state of the art during the pertinent time frame for each of the asserted patents.

1. Prior Art Patents and Published Patent Applications

The following prior art patents and published patent applications invalidate the Asserted Claims and/or provide background regarding the state of the art at the time of the alleged invention:

a. '088 Patent

U.S. Patent No. 11,026,088			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent App. Pub. No. 2019/0053149 ("Iwami")	US	Feb. 14, 2019
2	U.S. Patent App. Pub. No. 2007/0005788 ("Kim")	US	Jan. 4, 2007
3	U.S. Patent App. Pub. No. 2013/0147900 ("Weiser")	US	June 13, 2013
4	U.S. Patent App. Pub. No. 2015/0007302 ("Kato")	US	Jan. 1, 2015
5	U.S. Patent No. 9,323,713 ("Liansky")	US	Apr. 26, 2016
6	U.S. Patent No. 6,636,499 ("Dowling")	US	Oct. 21, 2003
7	U.S. Patent App. Pub. No. 2014/0240445 ("Jaynes")	US	Aug. 28, 2014
8	U.S. Patent App. Pub. No. 2005/0036509 ("Acharya")	US	Feb. 17, 2005
9	U.S. Patent App. Pub. No. 2014/0233443 ("Kumar")	US	Aug. 21, 2014
10	U.S. Patent App. Pub. No. 2014/0189807 ("Cahill")	US	July 3, 2014
11	U.S. Patent No. 9,529,344 ("Hagins '344")	US	Dec. 27, 2016
12	U.S. Patent No. 9,462,041 ("Hagins '041")	US	Oct. 4, 2016
13	U.S. Patent No. 9,246,921 ("Vlaminck '921")	US	Jan. 26, 2016
14	U.S. Patent No. 9,531,559 ("Vlaminck '559")	US	Dec. 27, 2016
15	U.S. Patent No. 10,386,807 ("Hagins '807")	US	Aug. 20, 2019

Maxell, Ltd.
Ex. 2015
IPR2025-01313
9 of 191

U.S. Patent No. 11,026,088			
No.	**Number**	**Origin**	**Date of Issue or Publication**
16	U.S. Patent No. 2012/0320874 (“Li”)	US	Dec. 20, 2012

b. ’650 Patent

U.S. Patent No. 11,277,650			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	PCT Patent App. Pub. No. WO 2005/0094080 (“Shindo”)	PCT	October 6, 2005
2	JP 2003-208375 (“Sasaki”)	JP	July 25, 2003
3	U.S. Patent App. Pub. No. 2004/0010687 (“Futa”)	US	January 15, 2004
4	U.S. Patent No. 5,619,250 (“McClellan”)	US	April 8, 1997
5	U.S. Patent App. Pub. No. 2004/0231003 (“Cooper”)	US	Nov. 18, 2004
6	U.S. Patent App. Pub. No. 2007/0093275 (“Bloebaum”)	US	April 26, 2007
7	U.S. Patent App. Pub. No. 2005/0110909 (“Staunton”)	US	May 26, 2005
8	U.S. Patent App. Pub. No. 2005/0097595 (“Lipsanen”)	US	May 5, 2005
9	U.S. Patent App. Pub. No. 2008/0077965 (“Kamimaki”)	US	Mar. 27, 2008
10	U.S. Patent No. 9,529,344 (“Hagins ’344”)	US	Dec. 27, 2016
11	U.S. Patent No. 9,462,041 (“Hagins ’041”)	US	Oct. 4, 2016
12	U.S. Patent No. 9,246,921 (“Vlaminck ’921”)	US	Jan. 26, 2016
13	U.S. Patent No. 9,531,559 (“Vlaminck ’559”)	US	Dec. 27, 2016
14	U.S. Patent No. 10,386,807 (“Hagins ’807”)	US	Aug. 20, 2019
15	U.S. Patent No. 2012/0320874 (“Li”)	US	Dec. 20, 2012

c. ’417 Patent

U.S. Patent No. 7,577,417			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 5,303,171 (“Belt”)	US	Apr. 12, 1994
2	U.S. Patent No. 6,223,293 (“Foster”)	US	Apr. 24, 2001
3	U.S. Patent No. 5,630,148 (“Norris”)	US	May 13, 1997
4	U.S. Patent No. 6,094,565 (“Alberth”)	US	July 25, 2000
5	U.S. Patent No. 5,909,585 (“Shinmiya”)	US	June 1, 1999

d. ’198 Patent

U.S. Patent No. 8,180,198			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 7,822,233 (“Nagaoka”)	US	10/26/2010
2	U.S. Patent No. 6,721,489 (“Benyamin”)	US	04/13/2004
3	U.S. Patent No. 8,024,757 (“Nara”)	US	09/20/2011
4	U.S. Patent Pub. No. 2003/0099460 (“Imada”)	US	05/29/2003

U.S. Patent No. 8,180,198			
No.	**Number**	**Origin**	**Date of Issue or Publication**
5	U.S. Patent Pub. No. 2001/0026287 (“Watanabe”)	US	10/04/2001
6	U.S. Patent No. 6,953,886 (“Looney”)	US	10/11/2005
7	U.S. Patent No. 7,624,337 (“Sull”)	US	11/24/2009
8	U.S. Patent Pub. No. 2005/0160458 (“Baumgartner”)	US	07/21/2005
9	U.S. Patent No. 7,275,063 (“Horn”)	US	09/25/2007
10	U.S. Patent Pub. No. 2006/0026636 (“Stark”)	US	02/02/2006
11	U.S. Patent Pub. No. 2004/0125705 (“Tsukahara”)	US	07/01/2004
12	U.S. Patent No. 7,779,097 (“Lamkin”)	US	08/17/2010
13	U.S. Patent Pub. No. 2001/0056434 (“Kaplan”)	US	12/27/2001
14	U.S. Patent No. 6,987,221 (“Platt”)	US	01/17/2006
15	U.S. Patent 7,461,099 (“Sharpe”)	US	12/02/2008

e. ’091 Patent

U.S. Patent No. 8,180,091			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent App. Pub. No. 2003/0079224 (Komar)	US	Apr. 24, 2003
2	U.S. Patent App. Pub. No. 2005/0184968 (Uchida)	US	Aug. 25, 2005
3	U.S. Patent No. 8,321,894 (Yoshida)	US	Nov. 27, 2012
4	U.S. Patent App. Pub. No. 2005/0015803 (Macrae)	US	Jan. 20, 2005
5	U.S. Patent No. 6,292,226 (Yamanaka)	US	Sep. 18, 2001
6	U.S. Patent No. 7,487,529 (Orlick)	US	Feb. 3, 2009
7	U.S. Patent App. Pub. No. 2004/0068740 (Fukuda)	US	Apr. 8, 2004
8	U.S. Patent No. 7,293,276 (Phillips)	US	Nov. 6, 2007
9	U.S. Patent App. Pub. No. 2005/0188408 (Wallis)	US	Aug. 25, 2005
10	U.S. Patent App. Pub. No. 2012/0087637 (Logan)	US	Apr. 12, 2012
11	U.S. Patent App. Pub. No. 2004/0154040 (Ellis)	US	Aug. 5, 2004
12	U.S. Patent No. 8,773,360 (Uchida)	US	July 8, 2014
13	U.S. Patent App. Pub. No. 2002/0174430 (Ellis ’430)	US	Nov. 21, 2002
14	U.S. Patent No. 7,667,123 (Phillips ’123)	US	Feb. 23, 2010
15	U.S. Patent App. Pub. No. 2005/0097600 (de Heer)	US	May 5, 2005
16	U.S. Patent No. 6,628,302 (White)	US	Sept. 30, 2003
17	U.S. Patent No. 7,546,537 (Crawford)	US	Jun. 9, 2009
18	U.S. Patent No. 6,378,130 (Adams)	US	Apr. 23, 2002
19	U.S. Patent No. 8,181,205 (Russ)	US	May 15, 2012
20	U.S. Patent No. 7,318,196 (Crow)	US	Jan. 8, 2008
21	U.S. Patent No. 5,594,509 (Florin)	US	Jan. 14, 1997
22	JP Patent App. No. 2005-73022 (Tamaru)	JP	Mar. 17, 2005
23	U.S. Patent No. 8,112,711 (Ackley)	US	Feb. 7, 2012
24	U.S. Patent No. 7,930,721 (Hernes)	US	Apr. 19, 2011
25	U.S. Patent No. 7,321,716 (Vallone)	US	Jan. 22, 2008

U.S. Patent No. 8,180,091			
No.	**Number**	**Origin**	**Date of Issue or Publication**
26	U.S. Patent No. 7,073,189 (McElhatten)	US	Jul. 4, 2006
27	U.S. Patent No. 7,536,647 (Walker)	US	May 19, 2009
28	U.S. Patent No. 6,804,825 (White)	US	Oct. 12, 2004
29	U.S. Patent No. 8,151,210 (Nezu)	US	Apr. 3, 2012
30	U.S. Patent No. 8,601,514 (Kellum)	US	Dec. 3, 2013
31	U.S. Patent No. 8,418,202 (Ahmad-Taylor)	US	Apr. 9, 2013
32	U.S. Patent No. 8,516,520 (Look)	US	Aug. 20, 2013
33	U.S. Patent App. Pub. No. 2005/024645 (Kavanagh)	US	Nov. 3, 2005
34	JP Patent App. No. 2001-298678 (Tanaka)	JP	Nov. 26, 2011
35	JP Patent App. No. 2001-223652 (Yamaguchi)	JP	Aug. 17, 2001
36	JP Patent App. No. 2004-265397 (Yoshimoto)	JP	Sept. 24, 2004
37	KR Patent App. No. 2005-048514	KR	May 24, 2005
38	European Patent No. 1 507 435 (Sakao)	EP	Feb. 16, 2005
39	U.S. Patent App. Pub. No. 2002/054028 (Uchida)	US	May 9, 2005
40	KR Patent App. No. 2002-008034	KR	Jan. 29, 2002
41	U.S. Patent No. 6,469,633 (Wachter)	US	Nov. 22, 2002
42	JP Patent No. H10-294907 (Hoshino)	JP	Nov. 4, 1998
43	U.S. Patent No. 5,956,025 (Goulden)	US	Sept. 21, 1999
44	JP Patent No. H07-336778 (Kitayama)	JP	Dec. 22, 1995
45	JP Patent App. No. 2004-194259 (Enomoto)	JP	July 8, 2004
46	JP Patent App. No. 2000-029833 (Kameyama)	JP	Jan. 28, 2000
47	JP Patent App. No. 2003-333574 (Ito)	JP	Nov. 21, 2003

f. ’645 Patent

U.S. Patent No. 7,952,645			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 5,808,697 (“Fujimura”)	US	Sept. 15, 1998
2	U.S. Patent App. Pub. No. 2004/0156545 (“Kim”)	US	Aug. 12, 2004

g. ’950 Patent

U.S. Patent No. 8,471,950			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 6,088,137 to Tomizawa	US	July 11, 2000
2	U.S. Patent No. 6,704,448 to Hasegawa	US	March 9, 2004
3	U.S. Patent No. 7,683,964 to Okuno	US	March 23, 2010
4	U.S. Patent No. 8,537,269 to Kwon et al.	US	Sept. 17, 2013
5	U.S. Patent App. Pub. No. 2003/0059117 to Iwasa et al.	US	March 27, 2003
6	U.S. Patent App. Pub. No. 2005/0271295 to Tabata et al.	US	Dec. 8, 2005

U.S. Patent No. 8,471,950			
No.	**Number**	**Origin**	**Date of Issue or Publication**
7	U.S. Patent App. Pub. No. 2006/0274936 to Ohkubo et al.	US	Dec. 7, 2006
8	U.S. Patent App. Pub. No. 2007/0291999 to Ito et al.	US	Dec. 20, 2007
9	U.S. Patent App. Pub. No. 2008/0170248 to Kang et al.	US	July 17, 2008
10	U.S. Patent App. Pub. No. 2009/0040336 to IRIE	US	Feb. 12, 2009
11	U.S. Patent App. Pub. No. 2009/0169101 to Mitarai et al.	US	July 2, 2009
12	U.S. Patent No. 5,093,716 to Kondo et al.	US	March 3, 1992
13	U.S. Patent No. 5,488,429 to Kojima et al.	US	Jan. 30, 1996
14	U.S. Patent No. 6,067,114 Omata et al.	US	May 23, 2000
15	U.S. Patent No. 6,332,041 to Yoshida	US	Dec. 18, 2001
16	U.S. Patent No. 8,023,701 to Hu	US	Sept. 20, 2011
17	U.S. Patent No. 8,237,850 to Tsujino et al.	US	Aug. 7, 2012
18	U.S. Patent App. Pub. No. 2004/0071352 to Mizoguchi et al.	US	April 15, 2004
19	U.S. Patent App. Pub. No. 2004/0252223 to Masuno et al.	US	Dec. 16, 2004
20	U.S. Patent App. Pub. No. 2005/0099515 to Tsuruoka	US	May 12, 2005
21	U.S. Patent App. Pub. No. 2005/0123211 to Wong et al.	US	June 9, 2005
22	U.S. Patent App. Pub. No. 2007/0047941 to Iwane et al.	US	March 1, 2007
23	U.S. Patent App. Pub. No. 2007/0109660 to Hayashi	US	May 17, 2007
24	U.S. Patent App. Pub. No. 2007/0286588 to Hatano et al.	US	Dec. 13, 2007
25	U.S. Patent App. Pub. No. 2008/0267452 to KONDO et al.	US	Oct. 30, 2008
26	U.S. Patent No. 6,456,328 to Okada	US	Sept. 24, 2002
27	U.S. Patent No. 6,587,593 to Matsuoka et al.	US	July 1, 2003
28	U.S. Patent No. 6,674,905 to Matsugu et al.	US	Jan. 6, 2004
29	U.S. Patent No. 7,224,397 to Sasaki	US	May 29, 2007
30	U.S. Patent No. 7,605,859 to Mihara	US	Oct. 20, 2009
31	U.S. Patent No. 7,792,357 to Kang	US	Sept. 7, 2010
32	U.S. Patent No. 7,920,202 to Park et al.	US	April 5, 2011
33	U.S. Patent App. Pub. No. 2006/0093212 to Steinberg et al.	US	May 4, 2006
34	U.S. Patent App. Pub. No. 2007/0103744 to CHIBA	US	May 10, 2007
35	U.S. Patent App. Pub. No. 2007/0189758 to Iwasaki	US	Aug. 16, 2007
36	JP Patent App. Pub. No. 2007-25559A to Shui	JP	Feb. 1, 2007

h. ’228 Patent

U.S. Patent No. 10,783,228			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 8,099,109 (“Altman”)	US	Jan. 17, 2012
2	U.S. Patent No. 8,976,965 (“Aminzade”)	US	Mar. 10, 2015
3	U.S. Patent App. Pub. No. 2008/0133336 to Altman	US	Jun. 5, 2008
4	U.S. Patent App. Pub. No. 2013/0115872 (“Huang”)	US	May 9, 2013

U.S. Patent No. 10,783,228			
No.	**Number**	**Origin**	**Date of Issue or Publication**
5	U.S. Patent App. Pub. No. 2013/0308838 (“Westerman”)	US	Nov. 21, 2013
6	U.S. Patent App. Pub. No. 2014/0343371 (“Sowers”)	US	Nov. 20, 2014
7	U.S. Patent App. Pub. No. 2015/0039880 to Aminzade	US	Feb. 5, 2015
8	U.S. Patent App. Pub. No. 2015/0347711 (“Soli”)	US	Dec. 3, 2015
9	U.S. Patent App. Pub. No. 2016/0037346 to Boettcher	US	Feb. 4, 2016
10	PCT Patent App. Pub. No. WO 2014/143843 (“Boettcher”)	PCT	Sept. 18, 2014

i. ’646 Patent

U.S. Patent No. 10,812,646			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	U.S. Patent No. 8,020,780 to Schultz	US	Nov. 30, 2007
2	U.S. Patent No. 8,902,182 to Rydenhag	US	Feb. 24, 2012
3	U.S. Patent No. 9,454,251 (“Guihot ’251”)	US	Jun. 26, 2013
4	U.S. Patent No. 9,509,822 to Kim	US	Feb. 17, 2014
5	U.S. Patent No. 9,521,247 (“Bandyopadhyay ’247”)	US	Jul. 23, 2014
6	U.S. Patent No. 9,563,347 (“Yano ’347”)	US	Mar. 26, 2013
7	U.S. Patent No. 9,736,217 (“Esaka ’217”)	US	May 19, 2014
8	U.S. Patent No. 9,769,512 (“Yu ’512”)	US	Nov. 8, 2012
9	U.S. Patent No. 10,375,343 (“Sharif-Ahmadi ’343”)	US	Apr. 2, 2013
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11	U.S. Patent App. Pub. No. 2010/0159995 to Stallings	US	Dec. 19, 2008
12	U.S. Patent App. Pub. No. 2011/0138444 to Kang	US	Dec. 3, 2010
13	U.S. Patent App. Pub. No. 2011/0163972 to Anzures	US	May 28, 2010
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U.S. Patent No. 10,812,646			
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47	U.S. Patent No. 11,157,507 to Lim	US	May 21, 2013
48	U.S. Patent No. 9,921,737 to Seo	US	Sept. 18, 2012
49	U.S. Patent No. 11,706,476 to Kim	US	Mar. 21, 2014
50	U.S. Patent No. 12,184,922 to Kim	US	Mar. 21, 2014

j. ’681 Patent

U.S. Patent No. 12,160,681			
No.	**Number**	**Origin**	**Date of Issue or Publication**
1	PCT Patent App. Pub. No. 2009/0322948 (“Funabiki”)	US	Dec. 31, 2009
2	PCT Patent App. Pub. No. 2007/0242062 (“Guo”)	US	Oct. 18, 2007
3	PCT Patent App. Pub. No. 2007/0222779 (“Fastert”)	US	Sept. 27, 2007
4	PCT Patent App. Pub. No. WO2005/057881 (“Anderson”)	PCT	June 23, 2005

2. Prior Art Non-Patent Publications

The following prior art non-patent publications invalidate the Asserted Claims and/or provide background regarding the state of the art at the time of the alleged invention:

a. ’088 Patent

U.S. Patent No. 11,026,088			
No.	**Title**	**Author**	**Date of Publication**
1	Jeff Hagins Demos SmartThings at LeWeb Paris 2012 https://www.youtube.com/watch?v=ZDMqWD_2Okg	LeWeb	Dec. 4, 2012
2	Hello, Smart Home - Part 1 https://www.youtube.com/watch?v=SrKA-3pQz94	SmartThings	Dec. 5, 2013
3	Hello, Smart Home - Part 2 https://www.youtube.com/watch?v=9qKA9JDxaaw	SmartThings	Feb. 5, 2014
4	SmartThings Demo at the Washington Post https://www.youtube.com/watch?v=Nihg7-R7ZJM	SmartThings	Mar. 25, 2014
5	A Product Tour of the New SmartThings Android App and Experience https://www.youtube.com/watch?v=gvlv7UKwdGQ	SmartThings	Mar. 19, 2014
6	Wouldn't it be smart if... you could sense a leak before it got out of hand? https://www.youtube.com/watch?v=gyhTiEid5pA	SmartThings	Jan. 27, 2014
7	Wouldn't it be smart if... cabinets, closets or containers could let you know when they're open? https://www.youtube.com/watch?v=NNpxlzK8jAU	SmartThings	Jan. 27, 2014
8	Demo: SmartSense Motion https://www.youtube.com/watch?v=lhS_CCGmedc	SmartThings	Apr. 3, 2013
9	How to Set Up TCP (Connect) in SmartThings Labs https://www.youtube.com/watch?v=Wh-ErQECFLQ	SmartThings	Apr. 10, 2014
10	Harmony Smart Control User Manual	Logitech	2013
11	Harmony Ultimate User Manual	Logitech	November 14, 2013
12	ZigBee™ Alliance, ZigBee Specification, Version 1.0	ZigBee Alliance	December 14, 2004
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U.S. Patent No. 11,026,088			
No.	**Title**	**Author**	**Date of Publication**
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16	*IEEE 802.11n-2009—Amendment 5: Enhancements for Higher Throughput*. IEEE-SA. 29 October 2009. doi:10.1109/IEEESTD.2009.5307322. ISBN: 978-0-7381-6046-7.	IEEE Standards Association	October 29, 2009

b. ’650 Patent

U.S. Patent No. 11,277,650			
No.	**Title**	**Author**	**Date of Publication**
1	Sega Outrun2 Owner’s Manual	Sega	November 2003
2	SynchronEyes Owner’s Manual	SMART Technologies	May 2006
3	ZigBee™ Alliance, ZigBee Specification, Version 1.0	ZigBee Alliance	December 14, 2004
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U.S. Patent No. 11,277,650			
No.	**Title**	**Author**	**Date of Publication**
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8	Game Boy Advance Instruction Booklet. Redmond, WA: Nintendo of America Inc., Printed in USA	Nintendo of America Inc.	2001
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U.S. Patent No. 11,277,650			
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16	Apple WWDC 2013 Keynote - iOS 7 (full length) [HD] https://www.youtube.com/watch?v=l8uiGTOE8S4	Štěpán Janků	June 11, 2013
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22	Gigaset 8825 User Manual	Siemens	2008
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U.S. Patent No. 11,277,650			
No.	**Title**	**Author**	**Date of Publication**
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c. ’198 Patent

U.S. Patent No. 8,180,198			
No.	**Title**	**Author**	**Date of Publication**
1	"Visualization methods for personal photo collections: browsing and searching in the PhotoFinder", In IEEE International Conference on Multimedia and Expo.. Vol. 3, pp. 1539 -1542 vol.3. - https://ieeexplore.ieee.org/document/871061	Kang H and Shneiderman B	2000
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3	Paul Resnick and Hal R. Varian. 1997. Recommender systems. Commun. ACM 40, 3 (March 1997), 56–58. https://doi.org/10.1145/245108.245121	Paul Resnick and Hal R. Varian	1997
4	Yagawa et al, The Digital Alburn: A Personal File-tainment System, 1996	Yagawa	1996
5	Shneiderman and Kang, Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos, 2000	Kang H and Shneiderman B	2000
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d. ’091 Patent

U.S. Patent No. 11,812,091			
No.	**Title**	**Author**	**Date of Publication**
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2	Personalized Digital Television	Ardissono, et al.	2004
3	ReplayTV 5500 User’s Guide	ReplayTV	2003
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19	Time Warner to Shutter ITV Effort	Pelline	May 1, 1997
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21	Philips AOLTV Internet TV	Philips	2000
22	User Manual AOLTV	Philips	May 19, 1999
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No.	**Title**	**Author**	**Date of Publication**
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31	DirectTV HD DVR User's Guide	TiVo Inc.	1999
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e. ’645 Patent[1]

U.S. Patent No. 7,952,645			
No.	**Title**	**Author**	**Date of Publication**
1	“Image Quality Improvement IC (DNIe4)”	Samsung	N/A
2	“Samsung Electronics aims to sell 3 million LCD TVs this year”	Money Today	May 2005
3	“Samsung Ranked World’s Top TV Supplier”	Money Today	Aug. 2005
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f. ’950 Patent

U.S. Patent No. 8,471,950			
No.	**Title**	**Author**	**Date of Publication**
1	EOS 7 etc. Service Manual	Canon	2000
2	Camedia E-20 Reference Manual	Olympus	2001
3	Digital Camera Dimage RD 3000 Camera Instruction Manual	Minolta	1999

[1] Samsung also relies on certain non-patent publications, identified in its claim chart exhibits, to show the public use, sale, and availability of certain prior art products.

U.S. Patent No. 8,471,950			
No.	**Title**	**Author**	**Date of Publication**
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5	Dimage Z20 Instruction Manual	Konica Minolta	2004
6	The Nikon Guide to Digital Photography with the COOLPIX S9 Digital Camera	Nikon	2006
7	Digital Camera COOLPIX S51c User's Manual	Nikon	2007
8	D1H User's Manual	Nikon	2004
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10	Nikon Scan 4 Reference Manual	Nikon	
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12	Camedia E-20 Reference Manual	Olympus	2001
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14	Digital Camera E-330 Advanced Manual	Olympus	2006
15	Advanced Manual Digital Camera IR-300	Olympus	2005
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18	Automatic Image Quality Improvement for Videoconferencing	Shi, Yu, Li, and Li	2004
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g. ’228 Patent[2]

U.S. Patent No. 10,783,228			
No.	**Title**	**Author**	**Date of Publication**
1	“Samsung Galaxy S5 4G LTE Smartphone User Manual”	Samsung	Apr. 2014
2	“User Guide; Samsung Galaxy S5”	Samsung	Apr. 2014
3	“Samsung Galaxy S5 4G LTE Smartphone User Manual”	Samsung	Apr. 2014
4	“Samsung Galaxy S5 User Guide”	Samsung	Apr. 2014
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6	“CNET How To - Set up the fingerprint scanner on the Galaxy S5”	CNET	Apr. 2014
7	“Galaxy S5 Fingerprint Scanner: Setup”	Droid Life	Apr. 2014
8	“Samsung Galaxy S5 | How To: Set up the S Health App”	Samsung	Apr. 2014
9	“How to use S Health on the Galaxy S 5”	TalkAndroid	Apr. 2014
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11	“Samsung Galaxy S5 S Health and Heart Rate Monitor Hands-on - uSwitch.com”	Uswitch Tech	Feb. 2014
12	“User Manual,” SM-R380	Samsung	May 2014
13	“Samsung Gear 2 & Gear 2 Neo: Unboxing & Review”	DetroitBORG	Apr. 2014

h. ’646 Patent

U.S. Patent No. 10,812,646			
No.	**Title**	**Author**	**Date of Publication**
1	Samsung Galaxy Note Pro 12.2 LTE, available at https://www.gsmarena.com/samsung_galaxy_note_pro_12_2_lte-5945.php	GSMArena	March 2014
2	Samsung Galaxy Note Pro User Manual	Samsung	2014
3	Samsung Galaxy Note Pro 12.2 inch using CHROMECAST, available at https://www.youtube.com/watch?v=IISvaZoba9Q	korguenkomodo	April 12, 2014

[2] Samsung also relies on certain non-patent publications, identified in its claim chart exhibits, to show the public use, sale, and availability of certain prior art products.

Maxell, Ltd.
Ex. 2015
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26 of 191

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12	Nexus 7 2nd Generation Teardown, available at https://www.ifixit.com/Teardown/Nexus+7+2nd+Generation+Teardown/16072	iFixit	July 26, 2013
13	Android KitKat, available at https://developer.android.com/about/versions/kitkat	Android Developers	N/A
14	Android 4.4 APIs, available at https://developer.android.com/about/versions/kitkat/android-4.4	Android Developers	N/A
15	RemoteControlClient, available at https://developer.android.com/reference/android/media/RemoteControlClient	Android Developers	N/A
16	RemoteController.OnClientUpdateListener, available at	Android Developers	N/A

U.S. Patent No. 10,812,646			
No.	**Title**	**Author**	**Date of Publication**
	https://developer.android.com/reference/android/media/RemoteController.OnClientUpdateListener		
17	Google Chromecast: Unboxing & Review, available at https://www.youtube.com/watch?v=JesYStHpW7I	DetroitBORG	August 2, 2013
18	Chromecast: How to cast using Netflix, available at https://www.youtube.com/watch?v=Gb2pFqXAbWs	Google Chrome	August 29, 2013
19	Chromecast: How to cast using Google Play Music, available at https://www.youtube.com/watch?v=J2V0ITFzon4	Google Chrome	November 27, 2013
20	Chromecast: How to cast using Google Play Movies, available at https://www.youtube.com/watch?v=rqRkJBAUa0Y	Google Chrome	August 29, 2013
21	How To Setup Google Chromecast, available at https://www.youtube.com/watch?v=pRUqnOADwMQ	BWOne	July 27, 2013
22	Android Central 144: Android 4.3, Chromecast and the new Nexus 7, available at https://www.youtube.com/watch?v=F851JD758yo	Android Central	July 24, 2013
23	Galaxy S4 Teardown, available at https://www.ifixit.com/Teardown/Samsung+Galaxy+S4+Teardown/13947	iFixit	April 27, 2013
24	What You May Not Know About GALAXY S4 Innovative Technology, available at https://news.samsung.com/global/what-you-may-not-know-about-galaxy-s4-innovative-techonology	Samsung	April 10, 2013
25	Samsung Galaxy S4 User Manual, available at https://www.att.com/support_static_files/manuals/Samsung_GalaxyS4.pdf?msockid=19c5b6a70ee9690d2393a0da0f1968b0	Samsung	2013
26	How to Update Samsung Galaxy S4 GT-I9505 with KitKat 4.4.2 XXUFNAI Firmware – Guide, available at https://androidadvices.com/update-samsung-	Android Advices	January 12, 2014

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27	Android 4.4 upgrade list: Is your device getting KitKat?, available at https://www.computerworld.com/article/1490266/android-4-4-upgrade-list-is-your-device-getting-kitkat.html	ComputerWorld	December 4, 2013
28	Apple iPhone 4S: Thoroughly Reviewed, available at https://web.archive.org/web/20131213222403/http:/www.anandtech.com/show/4971/apple-iphone-4s-review-att-verizon/9	AnandTech	October 31, 2011
29	iPhone 4S Teardown, available at https://www.ifixit.com/Teardown/iPhone+4S+Teardown/6610	iFixit	October 4, 2011
30	The all-new Apple TV, available at https://web.archive.org/web/20100929012828mp_/http:/www.apple.com/appletv/	Apple	September 29, 2010
31	The iPhone 4S: Faster, More Capable, And You Can Talk To It, available at https://web.archive.org/web/20111224061620mp_/http:/techcrunch.com/2011/10/11/iphone-4s-review/	TechCrunch	October 11, 2011
32	iPhone 4S, available at https://web.archive.org/web/20111231212512mp_/http:/www.apple.com/iphone/	Apple	December 31, 2011
33	iPhone 4S First Weekend Sales Top Four Million, available at https://web.archive.org/web/20111231220013mp_/http:/www.apple.com/pr/library/2011/10/17iPhone-4S-First-Weekend-Sales-Top-Four-Million.html	Apple	December 31, 2011
34	iPhone 4S Pre-Orders Top One Million in First 24 Hours, available at https://web.archive.org/web/20111231215954mp_/http:/www.apple.com/pr/library/2011/10/10iPhone-4S-Pre-Orders-Top-One-Million-in-First-24-Hours.html	Apple	December 31, 2011
35	iPhone User Guide, for iOS 6 Software, available at https://cdsassets.apple.com/live/6GJYWVAV/user/ma1658_iphone_ios6_user_guide.pdf	Apple	N/A

U.S. Patent No. 10,812,646			
No.	**Title**	**Author**	**Date of Publication**
36	iPhone User Guide for iOS 5.1 Software, available at https://cdsassets.apple.com/live/6GJYWVAV/user/ma1622_iphone_ios5_user_guide.pdf	Apple	N/A
37	iPhone 4S – Technical Specifications, available at https://support.apple.com/en-us/112004	Apple	N/A
38	Apple Community Post: iphone 4 will not connec to wifi network, available at https://discussions.apple.com/thread/3483096?sortBy=rank	N/A	November 11, 2011
39	Apple Communicty Post: Does iOS 6.1.1 support WPA2-Enterprise?, available at https://discussions.apple.com/thread/4811145?sortBy=rank	N/A	February 15, 2013
40	Buy the HTC One, available at https://web.archive.org/web/20131210102144/http://www.htc.com/us/go/buy-now-htc-one/	HTC	December 10, 2013
41	HTC One Teardown, available at https://www.ifixit.com/Teardown/HTC+One+Teardown/13494	iFixit	March 25, 2013
42	Your HTC One User Guide, available at https://files.customersaas.com/files/HTC_One_User_manual.pdf	HTC	2013
43	Qualcomm Snapdragon 600 Processors, available at https://www.qualcomm.com/content/dam/qcomm-martech/dm-assets/documents/snapdragon-600-processor-product-brief.pdf	Qualcomm	2013
44	HTC One Teardown, available at https://www.techinsights.com/blog/htc-one-teardown	Tech Insights	March 28, 2013
45	HTC One, available at https://www.gsmarena.com/htc_one-5313.php	GSM Arena	N/A
46	*AppLens and LaunchTile: Two Designs for One-Handed Thumb Use on Small Devices*, PROCEEDINGS OF THE SIGCHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS, available at https://doi.org/10.1145/1054972.1055001.	A. Karlson	2005

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48	HANDBOOK OF RESEARCH ON USER INTERFACE DESIGN AND EVALUATION FOR MOBILE TECHNOLOGY, "Understanding One Handed Use of Mobile Devices"	A. Karlson	2007
49	SCH-I600 SERIES USER GUIDE	Samsung Telecommunications America, Inc.	2003
50	UNIVERSAL PRINCIPLES OF DESIGN, ISBN 978-1-59253-587-3	William Lidwell	2003
51	DESIGNING THE USER INTERFACE: STRATEGIES FOR EFFECTIVE HUMAN-COMPUTER INTERACTION, ISBN 0-201-69497-2	Ben Shneiderman,	1998
52	What's new in the featured Android 4.4 KitKat?, available at https://handbook.jp/blog/2014/03/18/a-new-feature-offered-on-android4-4-kitkat-of-interest/	Handbook	Mar. 18, 2014
53	"Android 4.4 KitKat" announced, works even on low-cost smartphones with 512MB of memory, available at https://news.mynavi.jp/article/20131101-a031/	Yoichi Yamashita	Nov. 1, 2013
54	Android 4.4 KitKat lock screen verified, lock screen widgets can be turned on/off (updated), available at https://www.datacider.com/52728.php		Nov. 5, 2013
55	Android 4.4 KitKat Hidden Features!, available at https://www.youtube.com/watch?v=Tupx_N0SBuU	TechSmartt	Nov. 4, 2013
56	Chromecast: How to cast using Hulu Plus, available at https://www.youtube.com/watch?v=ckUdYddMAyQ	Google Chrome	Nov. 27, 2013
57	CheapCast, a free app that turns your Android device into Chromecast, is released, available at https://news.livedoor.com/article/detail/7952019/? _clicked=speciallink_float	Engadget Japan	Aug. 14, 2013
58	How to connect to WiFi on a HTC One, available at	How to Smartphone	Mar. 11, 2014

U.S. Patent No. 10,812,646			
No.	**Title**	**Author**	**Date of Publication**
	https://www.youtube.com/watch?v=c-Wm_VeRHVQ		
59	Samsung Galaxy SIII Teardown, available at https://www.ifixit.com/Teardown/Samsung+Galaxy+S+III+Teardown/9391	iFixit	May 29, 2012
60	AT&T SGH-I747 Galaxy SIII User Manual, available at https://downloadcenter.samsung.com/content/UM/202101/20210101045744723/ATT_SGH-I747_Galaxy_SIII_English_User_Manual_KK_NE4_F1.pdf	Samsung	2013
61	Samsung Galaxy S5 Manual, available at https://www.att.com/support_static_files/manuals/Samsung_Galaxy_S5.pdf?msockid=27bb7cfd7dad64fc14046a717cca651e	Samsung	2014
62	Google Chromecast Review!, available at https://www.youtube.com/watch?v=TK4u6wm-HIk	Marques Brownlee	Jul. 29, 2013
63	Chromecast Galaxy S3 Test, available at https://www.youtube.com/watch?v=MUkCdC4_si4	바른생활	Sept. 22, 2013
64	Samsung I9300 Galaxy S III, available at https://www.gsmarena.com/samsung_i9300_galaxy_s_iii-4238.php	GSM Arena	N/A
65	Samsung Galaxy S III: Unboxing and Review, available at https://www.youtube.com/watch?v=Af586Mz5zUQ	DetroitBORG	Jun. 8, 2012
66	Google's Chromecast Sells Out Hours After Being Unveiled, available at https://www.usnews.com/news/articles/2013/07/25/googles-chromecast-sells-out-hours-after-being-unveiled	Greg Otto	July 25, 2013
67	Google Chromecast (2013): Announcement and Review, available at https://www.youtube.com/watch?v=RUpgq8DohHA	CTNtechnologynews	Jul. 26, 2013
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69	Samsung Galaxy S4 Review, available at https://www.androidcentral.com/samsung-galaxy-s4-review	Alex Dobie	Apr. 24, 2013

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71	Samsung Galaxy SIII review: The phone that would be king, available at https://www.cnet.com/tech/mobile/samsung-galaxy-s-iii-review-the-phone-that-would-be-king/	Jessica Dolcourt	Jun. 19, 2012
72	Samsung Galaxy S III: specs, software, and everything else you need to know, available at https://www.theverge.com/2012/5/3/2996780/samsung-galaxy-s-iii-specs-software-pricing	The Verge	Oct. 25, 2012
73	Samsung Galaxy S3 Specs, available at https://www.androidauthority.com/samsung-galaxy-s3-specs-2-81906/	Bogdan Petrovan	May 3, 2012
74	Samsung Galaxy S3 Review, available at https://www.androidcentral.com/samsung-galaxy-s-iii-review	Alex Dobie	Jun. 4, 2012
75	Samsung Unveils Galaxy S5 to Focus On What Matters Most to Consumers, available at https://news.samsung.com/global/samsung-unveils-galaxy-s5-to-focus-on-what-matters-most-to-consumers	Samsung	Feb. 25, 2014
76	Samsung Galaxy Note Pro 12.2 Review, available at https://www.techradar.com/reviews/pc-mac/tablets/samsung-galaxy-note-pro-12-2-1210001/review	Jon Mundy	Mar. 5, 2014
77	Samsung Galaxy Note Pro 12.2 Review, available at https://www.t3.com/reviews/samsung-galaxy-note-pro-review	Max Parker	Feb. 21, 2014
78	Review: HTC One (M7), available at https://newatlas.com/htc-one-review/27386/	Will Shanklin	May 6, 2013
79	HTC One review, available at https://www.theverge.com/2013/3/11/4086390/htc-one-review	The Verge	Mar. 11, 2013
80	HTC One M7 review: An Android Superhero!, available at https://www.nextpit.com/reviews/htc-one-test-the-new-android-superhero	Loie Favre	Mar. 25, 2013

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81	HTC One (M7) review, available at https://www.techradar.com/reviews/phones/mobile-phones/htc-one-m7-1137132/review	Alex Roth	Aug. 28, 2013
82	Google Nexus 7 (summer 2013) review: the best Android tablet gets even better, available at https://www.cnet.com/reviews/google-nexus-7-review/	Eric Franklin	Jul. 25, 2013
83	Google Nexus 7 (2013) review, available at https://www.laptopmag.com/reviews/tablets/google-nexus-7-2013	Michael Prospero	Jul. 25, 2013
84	2nd-gen Google Nexus 7 2013 Review, available at https://www.yugatech.com/personal-computing/2nd-gen-google-nexus-7-2013-review/	Abe Olandres	Aug. 20, 2013
85	ASUS Google Nexus 7 (2013) review: The magnificent seven, available at https://www.gsmarena.com/asus_google_nexus_7_2_2013-review-964.php	GSM Arena	Aug. 9, 2013
86	Google Nexus 7 (2013) review, available at https://web.archive.org/web/20130802035007/https:/www.androidcentral.com/google-nexus-7-2013-review	Andrew Martonik	Jul. 30, 2013
87	Apple TV, available at https://web.archive.org/web/20101227163933/http:/store.apple.com/us/browse/home/shop_ipod/family/apple_tv?mco=MTM3NTM1Nzk	Apple	Accessed Dec. 27, 2010
88	iOS 4.2 Software Update, available at https://web.archive.org/web/20110105105147/http:/www.apple.com/ios/	Apple	Accessed Jan. 5, 2011
89	Apple TV 2nd Gen Setup Guide, available at https://cdsassets.apple.com/live/6GJYWVAV/user/ma1555_apple_tv_2nd_gen_setup_guide.pdf	Apple	2011
90	Apple TV, available at https://cdsassets.apple.com/live/6GJYWVAV/information/ma1556_apple_tv_2nd_gen_important_product_info.pdf	Apple	2011
91	Apple TV (2nd Generation) – Technical Specifications, available at https://support.apple.com/en-us/112428	Apple	N/A
92	Review: Apple's second generation Apple TV (2010), available at	Neil Hughes	Oct. 4, 2010

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No.	**Title**	**Author**	**Date of Publication**
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93	Google letting developers in on the Chromecast action with Google Cast SDK, available at https://www.engadget.com/2013-07-24-google-chromecast-sdk-developers.html	Steve Dent	Jul. 24, 2013
94	Google's Chromecast a brilliant play for the living room – especially with a $35 price tag, available at https://www.forbes.com/sites/jasonevangelho/2013/07/24/googles-chromecast-a-brilliant-play-for-the-living-room-especially-with-35-price-tag/	Jason Evangelho	Jul. 24, 2013
95	Google Chromecast review: can you make your dumb TV a smart one for just $35?, available at https://www.engadget.com/2013-07-29-google-chromecast-review.html	Michael Gorman	Jul. 29, 2013
96	Review: Google Chromecast, available at https://techcrunch.com/2013/07/28/review-google-chromecast/	Greg Kumparak	Jul. 28, 2013
97	Google Chromecast review, available at https://www.theverge.com/2013/7/29/4566718/google-chromecast-review	Nllay Patel	Jul. 29, 2013
98	Google Launches the $35 Chromecast Streaming Device To Bring Chrome To The Living Rom, available at https://techcrunch.com/2013/07/24/google-chromecast/	Matt Burns	Jul. 24, 2013
99	Google's Chromecast No Longer Comes with Free Netflix Because Demand Got Too Nuts, available at https://techcrunch.com/2013/07/25/chromecast-no-longer-comes-with-free-netflix-because-demand-got-too-nuts/	Greg Kumparak	Jul. 25, 2013
100	Netflix and YouTube's DIAL promises to be an open alternative to AirPlay, available at https://www.engadget.com/2013-01-24-netflix-youtube-dial.html	Nicole Lee	Jan. 24, 2013

i. ’681 Patent

U.S. Patent No. 12,160,681			
No.	**Title**	**Author**	**Date of Publication**
1	VESA E-DDC Standard (“EDDC”)	VESA	Dec. 26, 2007
2	ECMA Standard (“ECMA”)	ECMA	December 2008

3. Items Offered for Sale or Publicly Used or Known

The following products and systems offered for sale or publicly used or known invalidate the Asserted Claims. The identification of any prior art system or product includes any version or model of that product:

a. ’088 Patent

Prior Art Products and Systems – U.S. Patent No. 11,026,088
• SmartThings system available prior to August 29, 2014 (SmartThings Hub, SmartSense Open/Close, SmartSense Multi, SmartSense Motion, SmartSense Presence, SmartThings App; *see also* US Patents 9,246,291; 9,462,041; 9,529,344; 9,531,559; 10,386,807) (“SmartThings 2014 system”) • Nintendo DS with Download Play system • Quake III Arena system • Logitech Harmony systems available prior to August 29, 2014 (Harmony Smart Control, Harmony Ultimate) (“Logitech Harmony system”) • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

b. ’650 Patent

Prior Art Products and Systems – U.S. Patent No. 11,277,650
• Microsoft Media Center PC and extenders system • Nintendo DS with Download Play system • Nintendo DS with PictoChat system • Nintendo GameBoy Advance system • SmartThings 2014 system • Sega Outrun2 • SMART Technologies SynchronEyes system • Panasonic KX-TG4000B system • Siemens Gigaset 8825 system • Samsung Quick Share system • Apple AirDrop system • Quake III Arena system

Maxell, Ltd.
Ex. 2015
IPR2025-01313
36 of 191

• Google Gmail System • Napster • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

c. ’417 Patent

Prior Art Products and Systems – U.S. Patent No. 7,577,417
• Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

d. ’198 Patent

Prior Art Products and Systems – U.S. Patent No. 8,180,198
• ThumbsPlus • Photofinder • PhotoMesa • Picasa • iPhoto 2 • iView MediaPro • MusicMatch • Snapfish • Shutterfly • PhotoBucket • Adobe Photoshop Album • Netflix website from 2004 • ACDSee.com • Canon ZoomBrowser EX 2.2 • Flickr • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

e. ’091 Patent

Prior Art Products and Systems – U.S. Patent No. 11,812,091
• TiVo • ReplayTV • Time Warner Full Service Network • Comcast VoD/DVR • AOL TV • Microsoft Web TV • RealPlayer • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

f. ’645 Patent

Prior Art Products and Systems – U.S. Patent No. 7,952,645
• Samsung Digital Natural Image engine (“DNIe”) chip/chipset, as described by the documents cited in Exhibit 645-1. • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

g. ’950 Patent

Prior Art Products and Systems – U.S. Patent No. 8,471,950
• Aptina MT9D111 • Aptina MT9T111 • Aptina MT9V022 • Canon EOS • Minolta Dimage RD 3000 • Minolta Dimage Z20 • Nikon Coolpix L11/L10 • Nikon Coolpix S9 • Nikon Coolpix S51c • Nikon D1H • Nikon Scan 4 • Olympus Camedia E-20 • Olympus E-500 • Olympus IR-300 • Olympus E-330 • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

h. ’228 Patent

Prior Art Products and Systems – U.S. Patent No. 10,783,228
• Samsung Galaxy S5, including model no. SM-G900, as described by the documents cited in Exhibit 228-4. • Samsung Gear 2, including model nos. SM-R380 and SM-R381, as described by the documents cited in Exhibit 228-5. • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

i. ’646 Patent

Prior Art Products and Systems – U.S. Patent No. 10,812,646
• Apple iPhone 4S smartphone, running iOS and AirPlay to display local video (“iPhone 4S”)

• HTC One (M7) smartphone, running Android and the YouTube and/or Netflix application to display video on an external device via Google Chromecast ("HTC One") • Google Nexus 7 tablet, running Android and the YouTube application to display video on an external device via Google Chromecast ("Nexus 7") • Samsung Galaxy Note Pro 12.2 tablet, running Android and the YouTube application to display video on an external device via Google Chromecast ("Galaxy Note Pro") • Samsung Galaxy S5 smartphone, running Android and the YouTube application to display video on an external device via Google Chromecast ("Galaxy S5") • Samsung Galaxy S4 smartphone, running Android and the YouTube application to display video on an external device via Google Chromecast ("Galaxy S4") • Samsung Galaxy S3 smartphone, running Android and the YouTube application to display video on an external device via Google Chromecast ("Galaxy S3") • Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

j. '681 Patent

Prior Art Products and Systems – U.S. Patent No. 12,160,681
• Discovery is ongoing, and Defendants will identify additional products and systems as they become available.

Defendants continue to investigate the identities of the individuals or entities involved in the first sale, offer for sale, or public use of the prior art systems listed above and the precise dates that these systems were first sold, offered for sale, or were publicly used, and Defendants will produce additional documents, products and systems relating to the invalidity of the Asserted Claims by those items as they become available.

B. Disclosures Pursuant to P.R. 3-3(b)

With respect to P. R. 3-3(b), Exhibits 088-1 through 088-15; Exhibits 650-1 through 650-27; Exhibits 417-1 through 417-5; Exhibits 198-1 through 198-15; Exhibits 091-1 through 091-13; Exhibits 645-1 through 645-3; Exhibits 950-1 through 950-11; Exhibits 228-1 through 228-9; Exhibits 646-1 through 646-14; and Exhibits 681-1 through 681-5 specifically identify prior art that anticipates or renders obvious each Asserted Claim of Patents-in-Suit. In addition to the references specifically identified in the Exhibits, Defendants also reserve the right to rely on any

of the patents or publications deriving from applications in the respective claimed priority chains of the Patents-in-Suit, the references cited on the face of the Patents-in-Suit and related patents, the admitted prior art references in the specifications of the Patents-in-Suit and related patents, the prosecution history of the Patents-in-Suit and related patents, the references cited in any USPTO (including PTAB) proceedings related to the Patents-in-Suit or related patents, any references known to Maxell or any affiliated party and the references cited in any invalidity contentions that have been or will be submitted in any action or proceedings involving the Patents-in-Suit or related patents. Defendants may also rely on expert testimony and any additional prior art located or developed during the course of discovery. Further, Defendants may rely on any of the prior art references in these Invalidity Contentions to demonstrate a motivation to combine. Defendants may also rely on expert testimony to demonstrate a motivation to combine.

Defendants may also rely on: (i) foreign counterparts of U.S. patents identified in these invalidity contentions; (ii) U.S. counterparts of foreign patents and foreign patent applications identified in these invalidity contentions; and (iii) U.S. and foreign patents and patent applications corresponding to articles and publications identified in these Invalidity Contentions. Moreover, Defendants reserve the right to rely on uncited portions of the identified prior art, rely on other references (irrespective of whether such references themselves qualify as prior art) to show the state of the art, and/or to rely on expert testimony to provide context to, or aid in, understanding the cited portions of the identified prior art.

1. Anticipation

Defendants contend that the elements of the Asserted Claims of the Patents-In-Suit listed below are disclosed in and taught by the prior art references as set forth in the Exhibits:

Maxell, Ltd.
Ex. 2015
IPR2025-01313
40 of 191

a. ’088 Patent

Reference	Asserted ’088 Patent Claims Anticipated
SmartThings 2014 System	1, 14
Nintendo DS	1, 14
Quake III Arena	1, 14
Logitech Harmony system	1, 14

b. ’650 Patent

Reference	Asserted ’650 Patent Claims Anticipated
Microsoft Media Center PC and extenders system	1, 4
Nintendo DS Download Play system	1, 4
Nintendo DS PictoChat system	1, 4
Nintendo Game Boy Advance multiplayer system	1, 4
Quake III Arena system	1, 4
Sega Outrun2 system	1, 4
SMART Technologies SynchronEyes system	1, 4
SmartThings system available prior to August 29, 2014	1, 4
Panasonic KX-TG4000B multi-handset system	1, 4
Siemens Gigaset 8825 system	1, 4
Samsung Quick Share system	1, 4
Apple AirDrop system	1, 4
Google Gmail System	1, 4
Napster	1, 4

c. ’198 Patent

Reference	Asserted ’198 Patent Claims Anticipated
Nagaoka	1, 4
Watanabe	1, 4
Looney	1, 4
Kaplan	1, 4

Maxell, Ltd.
Ex. 2015
IPR2025-01313
41 of 191

Platt	1, 4
Horn	1, 4
Sull	1, 4
Lamkin	1, 4
Baumgartner	1, 4
Benyamin	1, 4
Tsukahara	1, 4
Stark	1, 4
ThumbsPlus	1, 4
Netflix Website	1, 4
PhotoFinder	1, 4
PhotoMesa	1, 4

d. ’091 Patent

Reference	Asserted ’091 Patent Claims Anticipated
TiVo System	1-3, 6, 7, 10, 13-17, 20
ReplayTV System	1-3, 6, 7, 10, 13-17, 20
Time Warner Full Service Network System	1-3, 6, 7, 10, 13-17, 20
Comcast VoD/DVR System	1-3, 6, 7, 10, 13-17, 20
AOL TV System	1, 3, 6, 7, 10, 13-17, 20
Microsoft Web TV System	1-3, 6, 7, 10, 13-17, 20
RealPlayer	1, 3, 6, 7, 10, 13-17, 20

e. ’645 Patent

Reference	Asserted ’645 Patent Claims Anticipated
Kim	1-8
Fujimura	1-8
DNIe	1-8

f. ’228 Patent

Reference	Asserted ’228 Patent Claims Anticipated
Aminzade	1-2, 4-9
Galaxy S5	1-2, 4-9
Gear 2	1-2, 4-9

g. ’646 Patent

Reference	Asserted ’646 Patent Claims Anticipated
iPhone 4S	1-7, 8, 11
HTC One	1-7, 8, 11
Nexus 7	1-4, 6-7, 8, 11
Galaxy Note Pro	1-3, 6-7, 8, 11
Galaxy S5	1-4, 6-7, 8, 11
Galaxy S4	1-4, 6-7, 8, 11
Galaxy S3	1-4, 6-7, 8, 11

h. ’681 Patent

Reference	Asserted ’681 Patent Claims Anticipated
US 2009/0322948 (“Funabiki”)	1-2, 7
US 2007/0242062 (“Guo”)	1-3, 7
WO2005/057881 (“Anderson”)	1-2, 7
US 11,611,718	1-5, 7

Defendants contend that each item of prior art identified above and/or in the accompanying charts anticipates one or more Asserted Claims of the Patents-in-Suit, either expressly, implicitly, or inherently as understood by a person having ordinary skill in the art. In some instances, Defendants treat certain prior art as anticipatory where certain elements are inherently present in light of the apparent claim constructions applied in Maxell’s Infringement Contentions. In addition, Defendants treat certain prior art as multi-reference anticipatory art when one prior art reference proves a second contains an “enabled disclosure,” when one prior

Maxell, Ltd.
Ex. 2015
IPR2025-01313
43 of 191

art reference explains the meaning of terms used in the second, or when one prior art reference shows that a characteristic not disclosed in the second is inherent. Defendants currently take no position as to whether the preamble of any asserted claim is limiting, and expressly reserve all rights to take any position with respect to such preambles for purposes of claim construction, invalidity, inequitable conduct, non-infringement, or otherwise. To the extent that any claim identified above is found not to be anticipated by a corresponding reference, such claim would have been obvious over that reference.

2. Some Asserted Claims Are Not Entitled to the Claimed Priority Dates

Some of the Asserted Claims of the Asserted Patents are not entitled to priority to some or all of the earlier applications listed on their respective front covers because those applications do not comply with the requirements of 35 U.S.C. § 112 for the full scope of those Asserted Claims as explained in more detail below.

a. ’091 Patent

The ’091 patent Asserted Claims are not entitled to the asserted August 30, 2005 filing date of Japanese Patent Application No. 2005-248476 (“JP ’476 App.”) for at least two reasons. First, “time related information” recited in independent claims 1 and 14 is not disclosed by the JP ’476 App. The only possible support for this limitation is the “expiration date” discussed in the JP ’476 App. at ¶ [0027]. This “expiration date” disclosure is significantly narrower than the definition of “time related information” in the ’091 patent Asserted Claims because the “expiration date” is limited to some period of time after which interactive content such as “news” and “weather forecasts” (the only two examples provided) are no longer current/“fresh information.” JP ’476 App. at ¶ [0027].

Second, as evidenced by Maxell’s infringement contentions, the Asserted Claims attempt to broaden the scope of a linear operation panel to include both linear and interactive operation

Maxell, Ltd.
Ex. 2015
IPR2025-01313
44 of 191

buttons. Similarly, the Asserted Claims attempt to broaden the scope of an interactive operation panel to include both interactive and linear operation buttons. There is no disclosure in the JP ’476 App. of a linear operation panel including interactive operation buttons or an interactive operation panel including linear operation buttons. To the contrary, the JP ’476 App. is critical of prior art displays in which both linear and interactive operation keys are displayed simultaneously, stating “in order to accommodate all functions, a large number of remote control keys are necessary, leading to the problems that users require a significant amount of time to learn the operation methods and that the operability is poor.” JP ’476 App. ¶ [0002].

b. ’650 Patent

The ’650 patent is not entitled to a priority date earlier than its filing date because its claims are not supported by any of the priority applications.

U.S. Application Serial No. 16/855,012, which issued as the ’650 patent, included as-filed claim 1, which recites:

> 1. A contents receiving system comprising:
> a content receiver; and
> a portable terminal storing ID information with which its user can be distinguished from other users of other portable terminals,
> the content receiver including:
> a receiving unit capable of receiving **content and subsidiary content** from at least one of a broadcast wave and a network;
> an output unit capable of outputting, as audio video content, a video and/or audio of **the content** received by the receiving unit;
> a transmission unit capable of transmitting **the subsidiary content** to the portable terminal, the transmission unit enabling information on a payment transaction corresponding to an ID information of the portable terminal to be transmitted to the portable terminal individually,
> the portable terminal including:
> a second transmission unit capable of receiving **the subsidiary content** and the information on the payment transaction transmitted from the transmission unit of the content receiver; and
> a processing unit for performing a processing regarding the payment transaction of **the content** by use of the information on the payment transaction received at the second transmission unit.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
45 of 191

On July 20, 2020, Patent Owner filed a preliminary amendment cancelling claim 1 and adding a new independent claim 2, which recites:

> A contents reproducing system comprising:
> a main equipment; and
> a plurality of subsidiary equipments,
> wherein the main equipment includes:
> a storage storing the content;
> a first display displaying the content; and
> a first controller controlling transmission/reception with the subsidiary equipments, the first controller storing device specific ID information of the plurality of the subsidiary equipments, and storing a plurality of information for identifying the content to be transmitted to the subsidiary equipments in association with the device specific ID information; and
> wherein the plurality of subsidiary equipments include:
> a second display displaying the content; and
> a second controller controlling transmission/reception with the main equipment, the second controller storing device specific ID information for identifying the subsidiary equipment and transmitting the device specific ID information to the main equipment when connecting to the main equipment, and
> wherein, the main equipment determines whether or not it is possible to connect to the subsidiary equipment storing the device specific ID information, and transmits the content stored in the storage to the subsidiary equipment which can be connected, based on the information for identifying the content associated with the device specific ID information of the subsidiary equipment, then the subsidiary equipment reproduces the received content on the second display.

The amendment significantly broadened the claim scope by removing "content" and "subsidiary content" and substituting the generic term "contents." By so doing, the amendment removed any distinction between content displayed at the main terminal and content displayed at the subsidiary terminals. This broadens the claims to encompass a system in which the identical content and only the identical content is displayed at the main terminal and all of the subsidiary terminals. This change fundamentally altered and broadened the scope of the claims of the '650 patent from a system that delivers personalized content to subsidiary terminals to broadly encompass a simple content distribution system that provides and displays the same content at the main terminal and all subsidiary terminals, a concept that is described nowhere in the '650 patent. The '650 patent ultimately issued with this broadened language:

Maxell, Ltd.
Ex. 2015
IPR2025-01313
46 of 191

> a main terminal…wherein the main terminal comprises: a storage storing **<u>the contents</u>**; a first display displaying **<u>the contents</u>**; … the plurality of subsidiary terminals comprise: a second display displaying **<u>the content</u>**… wherein, the main terminal…transmits **<u>the content</u>** stored in the storage to the subsidiary terminal which can be connected, based on the association information then the subsidiary terminal reproduces **<u>the received content</u>** on the second display.

For at least the reasons set forth below, the specification fails to provide support for this broadening amendment.

i. No Support for the Transmission of Generic "Content"

The specification of the '650 patent consistently distinguishes between "main content" and "subsidiary content." *E.g.*, '650 patent at 1:61-67:

> Therefore, it is desirable that an information receiving terminal unit used in the home, such as a television receiver, be capable of providing main content to be shared among the family members, and also be capable of providing subsidiary content in response to each family member's taste to allow viewing of the subsidiary content on an individual basis.

See also, e.g., 2:3-7; 2:57-62 ("In FIG. 1, through broadband Internet 104, a main content receiving display unit 100, which is a main receiving terminal unit, receives a stream delivered from a content delivery unit 103, and then displays main content. Here, it is assumed that the main content is multiplexed with subsidiary content to form a stream."); 3:17-24 ("On the other hand, each of subsidiary content control receivers A 101, B 102, which are subsidiary receiving terminal units, is devised to receive desired subsidiary content from the main content receiving display unit 100, and then to display the subsidiary content on the display unit, the desired subsidiary content being selected from among streams received by the main content receiving display unit 100."). While the '650 patent discloses that "main content" can *also* be transmitted to the requesting subsidiary device, the 650 patent makes clear that "subsidiary content" accompanies the "main content." '650 patent, 7:35-54.

The prosecution history of the ’650 patent’s family further supports this position. Each application in the priority chain requires the receipt and storage of both main content and subsidiary content by the main terminal and the transmission of at least the subsidiary content to the requesting subsidiary terminal. *See, e.g.*, ’049 patent, claim 1 (“a first receiving unit that is capable of receiving, from a broadcast wave or a network, a stream into which main content and subsidiary content are multiplexed… a second receiving and transmitting unit that is capable of receiving the subsidiary content transmitted from the transmission unit of the main receiving terminal unit”), ’747 patent , claim 1 (“a first receiving terminal configured to receive, from a broadcast wave or a network, a stream into which main content and subsidiary content are multiplexed; a separator configured to separate the received stream into the main content and the subsidiary content; a separator for separating the received stream into the main content and the subsidiary content… a second receiving terminal configured to receive the subsidiary content transmitted from the transmission terminal of the main receiving terminal”), ’076 application, as filed claim 1 (“a receiving unit capable of receiving content and subsidiary content from at least one of a broadcast wave and a network…a transmission unit capable of transmitting the subsidiary content to the portable terminal”), ’417 application, as filed claim 1 (“a receiving unit capable of receiving content and subsidiary content from at least one of a broadcast wave and a network…a transmission unit capable of transmitting the subsidiary content to the portable terminal”), ’841 application, as filed claim 1 (“a receiving unit capable of receiving content and subsidiary content from at least one of a broadcast wave and a network…a transmission unit capable of transmitting the subsidiary content to the portable terminal”).

The first time Patent Owner changed the claim language to omit any distinction between main content and subsidiary content was in the preliminary amendment filed during examination

Maxell, Ltd.
Ex. 2015
IPR2025-01313
48 of 191

of the ’650 patent. This language was not pending at any point during examination of any of the parent applications to the ’650 patent.

Moreover, the ’650 patent’s claim language eliminates any requirement that the subsidiary content be related to the main terminal, thereby further broadening the types of content that can be transmitted to the subsidiary terminal. This interpretation is inconsistent with the specification, which provides no support for such breadth. Instead, the specification makes clear that “subsidiary content” is not the same as the main content and is additional content related to the main content. For example:

> In addition, it may also be so devised that the subsidiary content, which has been recorded to the HDD, is transmitted to the subsidiary content control receiver in question through the request information input/transmission control unit 313 and the radio interface unit (main) 320. Moreover, the main content recorded to the HDD 315 may also be transmitted to the subsidiary content control receiver in question in like manner. In this case, the medium processing/display control unit 304 may convert a format of the main content into a format that conforms to a display format of the subsidiary content control receiver in question, before the main content is transmitted.

’650 patent, 7:35-46.

Still further, the ’650 patent claims have been broadened to encompass any contents, including those that can originate at the main terminal. This is contrary to both the specification and the as-filed limitations of the ’049 patent, which indicate that the content originates from a stream received “from a broadcast wave or a network.” *See, e.g.,* ’049 patent, As-Filed Specification (“a first receiving unit that is capable of receiving, from a broadcast wave or a network, a stream into which main content and subsidiary content are multiplexed”); ’650 patent at 2:57-60. There is no disclosure anywhere in the ’650 patent of the “main terminal” creating any content, whether main content or subsidiary content.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
49 of 191

Therefore, for the reasons provided above, the ’650 patent’s use of generic “contents” in the claims broadens the scope of the claims beyond what is supported in the originally filed specification and its parent applications. As such, the ’650 patent is entitled to a priority date no earlier than its filing date of April 22, 2020.

ii. No Support for “Content Information for Identifying Each of the Contents”

Separate from the “contents” limitation, the ’650 patent is also not entitled to a priority date earlier than its filing date because the limitation “content information for identifying each of the contents” is unsupported by the specification or any claim set in any prior application to which the ’650 patent claims priority.

The ’650 patent consistently describes content information as “subsidiary content” and only “subsidiary content.” For example:

> In addition, the subsidiary content may also be content information obtained by down-converting the main content (for example, by converting from the HD (High Definition) resolution into the SD (Standard Definition) resolution), and/or content information obtained by transforming an encoding method of the main content (for example, by transforming from the MPEG-2 (Motion Picture Expert Group) to the MPEG-4). In this case, the content information is subjected to copyright protection in response to characteristics of the content information. Moreover, if each of the subsidiary content control receivers A 101, B 102 has a browser function of browsing Internet sites, the subsidiary content information may also be home page data (address information, and URL (Uniform Resource Locator)) on Internet and metadata.

’650 patent, 3:33-47.

> For example, the main content receiving display unit 100 acquires the display resolution, information about content-image format processing functions such as H.264 and MPEG-4, and information about audio processing functions such as AAC or MP3. Then, the main content receiving display unit 100 converts a format of the main content into that of the subsidiary content corresponding to terminal information of a target that is either the subsidiary content control receiver 101 A or 101 B. Accordingly, it becomes possible not only to provide desired content information, but also to provide content corresponding to each of the subsidiary content control receivers 101 A, 101 B.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
50 of 191

’650 patent, 4:61-5:9.

> Here, the request information input/transmission control unit 313 performs encoding control so that the subsidiary content is compressed and encoded by the medium processing/display control unit 304. Then, the content information obtained by compressing and encoding the subsidiary content is packeted into communication packets, the subsidiary content having been extracted as a result of the separation of the received stream by the medium processing/display control unit 304 in response to the request information.

’650 patent, 6:30-38.

> Portable equipment such as a portable video game machine may also be used as the subsidiary content control receiver so long as the portable equipment has a network function, and also has a function of transmitting/receiving control information and content information to/from the main content receiving display unit 100.

’650 patent, 8:18-24.

> The “Program guide” is the above-described electronic program guide (EPG). For example, a program guide whose format is similar to that of television program listings appearing in newspaper pages is displayed. The “Supplementary audio” is, for example, audio in other languages, such as second audio. For example, if Japanese is used as main audio, audio in English or Chinese is used as the supplementary audio. The “Subtitles” is subtitle data that is provided in synchronization with audio of the main content. The “Data broadcast” is, for example, data described in BML (Broadcast Markup Language). The “Data broadcast” is used to provide, for example, news, market information such as stock prices, weather forecast, and advertisement information such as commodities. In addition, the “Related information” is, for example, information relating to main content. For example, if the main content is a drama, the “Related information” includes the director and cast of the drama, and web page information (URL) of the drama. Further, if the main content is a commercial, the “Related information” includes information relating to a commodity introduced in the commercial. More specifically, the “Related information” includes, for example, a price of the commodity, the scheduled sale day, a manufacturer of the commodity, and web page information (URL) of the manufacturer. In the case of broadband content, a broadband communication path is utilized. Accordingly, in addition to the delivery of the same content information, it is also possible to deliver commercial information that suits users age group, and user's taste. Thus, besides main commercials provided by main sponsors, it is also possible to provide each of the subsidiary content control receivers A 101, B 102 with commercial information corresponding to a user who possesses a terminal unit.

’650 patent, 8:50-9:15.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
51 of 191

> The subsidiary content control receiver A 102 transmits an acquisition request 605 to acquire the automobile information 602, which accompanies broadcast wave video content information 600, to the main content receiving display unit 100 together with ID information.

’650 patent, 13:15-19.

> On the other hand, the subsidiary content control receiver B 102 transmits an acquisition request 606 to acquire information relating to BGM (Back Ground Music) of an automobile commercial to the main content receiving display unit 100 together with ID information. The main content receiving display unit 100 analyzes the received data, and thereby judges that the received data includes a request to acquire commercial song information accompanying the automobile commercial content 601. After that, the main content receiving display unit 100 extracts the commercial song information 603 from the video content information 600 received from the broadcast wave, and then transmits the commercial song information 603 to the subsidiary content control receiver B 102 together with the ID information of the subsidiary content control receiver B 102. The subsidiary content control receiver B 102 accesses the information providing server 610 on the basis of the URL information to acquire, from the information providing server 610, information including a title of a desired commercial song (BGM), an artist name, and an album name so that the acquired information is displayed. If the subsidiary content control receiver B 102 is a portable telephone, it is also possible to acquire the information by accessing the information providing server 610 through the portable telephone network.

’650 patent, 13:39-63.

> As a result, even if the family members are viewing automobile commercial content information, it is possible to acquire the automobile information and the commercial song information on an individual basis. Therefore, it becomes possible to provide a new CM viewing environment that could not be achieved by the conventional technologies. Moreover, by sharing a television set located in a living room among the family members, and by possessing each subsidiary content control receiver by each family member, it becomes possible to enjoy a digital life style that differs from the conventional ones, the digital life style in question being based on not only the main content information but also the subsidiary content information corresponding to user's taste.

’650 patent, 13:64-14:10.

In other words, it is clear that the “content information” does not identify “the contents” stored in the memory of the main terminal, but instead refers to the information requested by the subsidiary terminal and transmitted to the subsidiary terminal in the form of subsidiary content.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
52 of 191

This is further supported by Figure 8 of the ’650 patent, which allegedly shows a table corresponding to the claimed “association information.” In this context, the “content information” is the subsidiary content listed in the requested information column. The “EPG data” does not identify contents stored at the main terminal, but is instead a “kind of subsidiary content” requested by the subsidiary terminal. ’650 patent.

iii. No Support for “association information…the association information defines that one of the contents identified by the content information is associated with one of the device specific ID information”

Separate to the “contents” limitations and the “content information” limitations, the ’650 patent is also not entitled to a priority date earlier than its filing date because the limitation “association information” is unsupported by the specification and fails to provide support in any claim set of its parent applications.

The specification does not describe a separate piece of information referred to as “association information.” Instead, the association information is merely the association that exists between the requested subsidiary content and the terminal ID that requested the subsidiary content.

The earlier applications in the family acknowledge this distinction as none of the filings recite the limitation “association information,” instead opting for the phrase “associated with.” *See* ’049 patent, claim 1 (“the unique ID information associated with the subsidiary receiving terminal and the user ID containing in the request”), claim 1 (“the main receiving terminal unit transmits personalized subsidiary content including URL information that is linked to the main content in association with the specific unique ID information and user ID”), ’747 patent, claim 1 (“said each subsidiary receiving terminal acquires information from a website on a basis of URL

Maxell, Ltd.
Ex. 2015
IPR2025-01313
53 of 191

information in association with the unique ID information and an identifier associated with a specific user”).

Therefore, it is clear that the ’650 patent’s specification does not support independent “association information” that “defines that one of the contents identified by the content information is associated with one of the device specific ID information.” Instead, the ’650 patent only provides support for the notion that subsidiary content or content information is associated with a device ID.

iv. No Support for Reception and Display of Content at Subsidiary Terminals Temporally and Spatially Remote From Display of Content at Main Terminal

The ‘650 patent discloses that content is received and displayed at the subsidiary terminals while content is being displayed on the main terminal, and that the subsidiary terminals are located such that the users of the subsidiary terminals can view the content on the subsidiary terminals while also viewing the content displayed on the main terminal. For example, the ’650 patent discusses at 2:16-22 family viewing movie at main terminal/large screen TV while family members have subsidiary terminals for viewing subsidiary content “while family members view the main content.” See also ’650 patent, 2:64-3:3 (discussing main content “viewed in common by family members”). The ’650 patent also discloses that the subsidiary content is multiplexed with the main content, thus indicating that the main content and the content viewed at the subsidiary terminals is received and displayed at the same time. *See e.g.,* ’650 patent, 2:3-7, 2:45-64. Other passages of the ’650 patent specification that indicate that subsidiary content is displayed at the same time as the main content and that the subsidiary terminals are located such that the users of those terminals can also view the main content include, without limitation, 11:11-15 and 14:33-37. In contrast to these disclosures in the ’650 specification, there is no disclosure of a subsidiary terminal that receives and displays content at times other than the

Maxell, Ltd.
Ex. 2015
IPR2025-01313
54 of 191

content at the main terminal being received and displayed, and/or that is located such that the user of the subsidiary terminal cannot also view the content at the main terminal. However, the claims of the ’650 patent include no temporal or spatial limitations that preclude a subsidiary terminal from receiving and displaying content at times other than when the content at the main terminal is being received and displayed, or that preclude the subsidiary terminal from being located such that the user of the subsidiary terminal cannot also view the content at the main terminal. The absence of such temporal and spatial limitations from the ’650 patent claims (particularly in view of the absence of any restrictions on the types of content at the main terminal and subsidiary terminals) result in those claims reading on generic content distribution systems that are nowhere described in the ‘650 patent specification.

v. No Support for Main Terminals That Include Remote Servers

The ’650 patent discloses terminals that themselves perform all functions required of them. There is no disclosure anywhere in the ’650 patent specification of any “terminal” that includes a remotely-located server that acts as an extension of, or acts on behalf of, that terminal. For example, the ’650 patent discloses a main content receiving display unit 100 that is connected to a separate content delivery unit 103 as shown in Fig. 3. Nowhere is there any description of device 103 acting on behalf of, or as an extension of, device 100. The same is true with respect to the server 610 of Fig. 6. Neither the server 610 or the content delivery unit 103 transmits information to a subsidiary terminal as an extension of, or on behalf of, a main terminal 100; instead, the main terminal 100 itself transmits the content to the subsidiary terminals. If Maxell’s infringement allegations are correct that scope of a “main terminal” in the asserted claims can include remotely located and separately addressable devices that act as an extension

of, or on behalf of, the main terminal, then there is no written description support for the full scope of the asserted claims in the ’650 patent specification.

In sum, the claims of the ’650 patent are not supported by the written description of any of the Priority Applications. As such, the ’650 patent is not entitled to a priority date earlier than its filing date.

3. Obviousness

Under 35 U.S.C. § 103, a patent is invalid if the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. 35 U.S.C. § 103(a).

In general, a claimed invention is unpatentable if the differences between it and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” 35 U.S.C. § 103(a); *Graham v. John Deere Co.*, 383 U.S. 1, 13-14 (1966). The ultimate determination of whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including: “scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness.” *Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 877 (Fed. Cir. 1993); *see also Graham*, 383 U.S. at 17-18.[3]

KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007) (“*KSR*”) reaffirmed *Graham*, holding that a claimed invention can be obvious even if there is no teaching, suggestion, or motivation (the “TSM test”) for combining the prior art to produce that invention. In determining

[3] Here, no objective evidence of non-obviousness has been offered by Plaintiff. Defendants reserve the right to supplement their contentions to respond to any such evidence should Plaintiff raise them in the future.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
56 of 191

whether a claim is obvious, "[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *Id*. at 418. In *KSR*, the Supreme Court unanimously rejected the TSM test long used by the United States Court of Appeals for the Federal Circuit to determine when references can be combined to find a claim obvious under § 103(a). In its place, the Court directed the immediate application of a broad, flexible analysis in determining the patentability/validity of claimed subject matter when tested against the statutory mandate that claims be non-obvious. *Id*. at 415.

To be nonobvious, an improvement must be "more than the predictable use of prior art elements according to their established functions." *Id*. at 417. "The proper question [for a court to ask is] whether a [person] of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to upgrading" the disclosure of one prior art reference with that of another. *Id*. at 424. "Common sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle." *Id*. at 420. The person of ordinary skill in the art should not be limited to looking at prior art designed to solve the same problem nor to approaching that art from the perspective of solving the problem the patentee claimed to have been solving. *Id*. at 419-20.

Any suggested obviousness combinations set forth herein are in the alternative to Defendants' anticipation contentions and are not to be construed to suggest that any reference included in any combination is not anticipatory in its own right. In particular, Defendants are

currently unaware of the extent to which Maxell will contend that certain limitations of the Asserted Claims are not disclosed in the art identified by Defendants as anticipatory. To the extent that an issue arises with respect to any such claim limitation, Defendants reserve the right to identify other references and combinations, which may make obvious the addition of the allegedly missing limitation to the disclosed system or method.

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *See In re Keller*, 642 F.2d 413 (CCPA 1981). The obviousness combinations set forth in the Exhibits are not premised on a bodily incorporation theory, but instead are premised on combining the disclosures of features and functions from one reference with those of the other references cited in the Exhibits.

The rationale to combine or modify prior art references is significantly stronger when the references seek to solve the same problem, come from the same field, and correspond well. *In re Inland Steel Co*., 265 F.3d 1354, 1362 (Fed. Cir. 2001). The Federal Circuit has allowed two references to be combined as invalidating art under similar circumstances, namely "[the prior art] focus[es] on the same problem that the … patent addresses: enhancing [the flexibility of stents]. Moreover, both [prior art references] come from the same field …. Finally, the solutions to the identified problems found in the two references correspond well." *Id*. at 1364 (concerning patents and prior art relating to improving the magnetic and electrical properties of steel). Motivation to combine any of the prior art references discussed herein is found, explicitly or implicitly, in one or more of the following:

1. a person of ordinary skill in the art's own knowledge or common sense;
2. the prior art references themselves;
3. the subject matter acknowledged as prior art in the patent in suit;
4. the interrelated teachings of multiple prior art references identified herein;
5. the nature of the problem to be purported solved by the patent in suit and the existence of similar improvements in similar applications;
6. design incentives and other market forces, including the advantages of creating a superior and more desirable product and the effects of demands known to the design community or present in the marketplace;
7. the ability to implement the alleged invention as a predictable variation of the prior art;
8. combining prior art elements according to known methods to yield predictable results;
9. improvements in similar devices;
10. applying a known technique to a known device (method or product) ready for improvement to yield predictable results;
11. any needs or problems known in the field and purportedly addressed by the patent in suit—i.e., "obvious to try";
12. the number of identified, predictable solutions to the problem(s) purportedly addressed by the patent in suit;
13. the simple substitution of one known element for another to obtain predictable results; and
14. some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

Defendants provide the following legal background regarding obviousness combinations. No showing of a specific motivation to combine prior art is required to combine the references disclosed above and in the attached charts, as each combination of art would have yielded expected results and at most would simply represent a known alternative to one of skill in the art. *See Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1058 (Fed. Cir. 2016); *Intercontinental*

Great Brands LLC v. Kellogg N. Am. Co., 869 F.3d 1336, 1344 (Fed. Cir. 2017); *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1739-40 (2007) (rejecting the Federal Circuit's "rigid" application of the teaching, suggestion, or motivation to combine test, and instead applying an "expansive and flexible" approach). Indeed, the Supreme Court held that a POSITA is "a person of ordinary creativity, not an automaton" and "in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple patents together like pieces of a puzzle." *KSR*, 127 S.Ct. at 1742. In addition, to the extent one reference is incorporated into another reference, it thereby forms part of the incorporating reference, and is not a separate reference to combine. Nevertheless, in addition to the information contained in this section and elsewhere in these contentions, including the claim charts attached as Exhibits hereto, Defendants hereby identify motivations and reasons to combine.

One of ordinary skill in the art would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons. One of ordinary skill in the art would have combined particular features of systems and methods disclosed in certain of the prior art references with other prior art references that do not expressly disclose such particular features because, *e.g.*, (i) the teachings of the references are interrelated and cite each other, (ii) it would have been simple substitution of particular features in one reference into the system or network of another reference, (iii) the nature of the problem alleged by the patent in suit made such combinations apparent and a matter of common sense, (iv) design incentives and other market forces would have made the advantages of such combinations clear, (v) such combinations would have been predictable variations of the prior art, (vi) such combinations would have yielded predictable results, (vii) it would have been obvious to try such combinations, and (viii)

such combinations would be within a finite number of identified, predictable solutions to the problem alleged by the patent in suit.

a. Obviousness Combinations

In addition to the information contained in this section and elsewhere in these contentions, including the claim charts attached as Exhibits hereto, Defendants hereby identify the following example combinations of prior art which invalidate the Asserted Claims under § 103.

i. ’088 Patent

U.S. Patent No. 11,026,088		
Combination(s)	**1**	**14**
Iwami + Kim	x	x
Jaynes + Acharya	x	x
SmartThings 2014 + Hagins ’344	x	x
SmartThings 2014 + Hagins ’041	x	x
SmartThings 2014 + Vlaminck ’921	x	x
SmartThings 2014 + Vlaminck ’559	x	x
SmartThings 2014 + Hagins ’807	x	x
SmartThings 2014 + ZigBee Specification (rev 20)	x	x
SmartThings 2014 + Z-Wave Protocol	x	x
SmartThings 2014 + IEEE Std. 802.11n	x	x

ii. ’650 Patent

U.S. Patent No. 11,277,650		
Combination(s)	**1**	**4**
Shindo	x	x
Shindo + Z-Wave Protocol	x	x
Shindo + IEEE Std. 802.15.4	x	x
Shindo + Zigbee Specification	x	x
Sasaki	x	x
Sasaki + Z-Wave Protocol	x	x
Sasaki + IEEE Std. 802.15.4	x	x
Sasaki + Zigbee Specification	x	x
Futa + McClellan	x	x
Futa + McClellan + Z-Wave Protocol	x	x

U.S. Patent No. 11,277,650		
Combination(s)	**1**	**4**
Futa + McClellan + IEEE Std. 802.15.4	x	x
Futa + McClellan + Zigbee Specification	x	x
Futa + McClellan + Cooper	x	x
Futa + McClellan + Cooper + Z-Wave Protocol	x	x
Futa + McClellan + Cooper + IEEE Std. 802.15.4	x	x
Futa + McClellan + Cooper + Zigbee Specification	x	x
Sugimoto + Shindo	x	x
Sugimoto + Shindo + Z-Wave Protocol	x	x
Sugimoto + Shindo + IEEE Std. 802.15.4	x	x
Sugimoto + Shindo + Zigbee Specification	x	x
Sugimoto + Sasaki	x	x
Sugimoto + Sasaki + Z-Wave Protocol	x	x
Sugimoto + Sasaki + IEEE Std. 802.15.4	x	x
Sugimoto + Sasaki + Zigbee Specification	x	x
Sugimoto + Futa	x	x
Sugimoto + Futa + Z-Wave Protocol	x	x
Sugimoto + Futa + IEEE Std. 802.15.4	x	x
Sugimoto + Futa + Zigbee Specification	x	x
Sugimoto + Futa + McClellan	x	x
Sugimoto + Futa + McClellan + Z-Wave Protocol	x	x
Sugimoto + Futa + McClellan + IEEE Std. 802.15.4	x	x
Sugimoto + Futa + McClellan + Zigbee Specification	x	x
Sugimoto + Futa + McClellan + Cooper	x	x
Sugimoto + Futa + McClellan + Cooper + Z-Wave Protocol	x	x
Sugimoto + Futa + McClellan + Cooper + IEEE Std. 802.15.4	x	x
Sugimoto + Futa + McClellan + Cooper + Zigbee Specification	x	x
Staunton + Shindo	x	x
Staunton + Shindo + Z-Wave Protocol	x	x
Staunton + Shindo + IEEE Std. 802.15.4	x	x
Staunton + Shindo + Zigbee Specification	x	x
Staunton + Sasaki	x	x
Staunton + Sasaki + Z-Wave Protocol	x	x
Staunton + Sasaki + IEEE Std. 802.15.4	x	x
Staunton + Sasaki + Zigbee Specification	x	x
Staunton + Futa	x	x
Staunton + Futa + Z-Wave Protocol	x	x
Staunton + Futa + IEEE Std. 802.15.4	x	x
Staunton + Futa + Zigbee Specification	x	x
Staunton + Lipsanen	x	x
Staunton + Lipsanen + Z-Wave Protocol	x	x
Staunton + Lipsanen + IEEE Std. 802.15.4	x	x
Staunton + Lipsanen + Zigbee Specification	x	x

U.S. Patent No. 11,277,650		
Combination(s)	**1**	**4**
Bloebaum	x	x
Bloebaum + Z-Wave Protocol	x	x
Bloebaum + IEEE Std. 802.15.4	x	x
Bloebaum + Zigbee Specification	x	x
Bloebaum + Lipsanen	x	x
Bloebaum + Lipsanen + Z-Wave Protocol	x	x
Bloebaum + Lipsanen + IEEE Std. 802.15.4	x	x
Bloebaum + Lipsanen + Zigbee Specification	x	x
Bloebaum + Shindo	x	x
Bloebaum + Shindo + Z-Wave Protocol	x	x
Bloebaum + Shindo + IEEE Std. 802.15.4	x	x
Bloebaum + Shindo + Zigbee Specification	x	x
Bloebaum + Sasaki	x	x
Bloebaum + Sasaki + Z-Wave Protocol	x	x
Bloebaum + Sasaki + IEEE Std. 802.15.4	x	x
Bloebaum + Sasaki + Zigbee Specification	x	x
Bloebaum + Futa	x	x
Bloebaum + Futa + Z-Wave Protocol	x	x
Bloebaum + Futa + IEEE Std. 802.15.4	x	x
Bloebaum + Futa + Zigbee Specification	x	x
Kamimaki + Shindo	x	x
Kamimaki + Sasaki	x	x
SynchronEyes	x	x
SynchronEyes+ Z-Wave Protocol	x	x
SynchronEyes + IEEE Std. 802.15.4	x	x
SynchronEyes + Zigbee Specification	x	x
Sega OutRun2	x	x
Sega OutRun2+ Z-Wave Protocol	x	x
Sega OutRun2 + IEEE Std. 802.15.4	x	x
Sega OutRun2 + Zigbee Specification	x	x
Samsung Quick Share system + IEEE Std. 802.11n	x	x
Quake III Arena system + IEEE Std. 802.11n	x	x
Apple AirDrop system + IEEE Std. 802.11n	x	X
Microsoft Media Center PC and extenders system	x	x
Nintendo DS Download Play system	x	x
Nintendo DS PictoChat system	x	x
Nintendo Game Boy Advance multiplayer system	x	x
Quake III Arena system	x	x
SmartThings system available prior to August 29, 2014	x	x
Panasonic KX-TG4000B multi-handset system	x	x
Siemens Gigaset 8825 system	x	x
Samsung Quick Share system	x	x

U.S. Patent No. 11,277,650		
Combination(s)	**1**	**4**
Apple AirDrop system	x	x
Google Gmail System	x	x
Napster	x	x

iii. ’417 Patent

U.S. Patent No. 7,577,417				
Combination(s)	**1**	**2**	**3**	**7**
Belt + Foster + Norris	x	x		x
Belt + Foster + Norris + Alberth	x	x	x	x
Alberth + Shinmiya	x		x	x

iv. ’198 Patent

U.S. Patent No. 8,180,198		
Combination(s)	**1**	**4**
ThumbsPlus in combination with Nagaoka	X	X
Netflix Website in combination with Nagaoka	X	X
ThumbsPlus in combination with Netflix Website	X	X
PhotoFinder in combination with Nagaoka	X	X
PhotoFinder in combination with Netflix Website	X	X
PhotoFinder in combination with Netflix Website, ThumbsPlus	X	X
PhotoFinder in combination with PhotoMesa	X	X
PhotoFinder in combination with ThumbsPlus	X	X
PhotoFinder in combination with ThumbsPlus and Nagaoka	X	X
PhotoFinder in combination with ThumbsPlus, iPhoto 2, iView MediaPro, and MusicMatch, Netflix Website	X	X
PhotoFinder in combination Watanabe	X	X
PhotoFinder in combination with Nagaoka and Watanabe	X	X
ThumbsPlus in combination with Nagaoka and Watanabe	X	X
PhotoFinder in combination with AdobePhotoshop Album	X	X
PhotoFinder in combination with PhotoBucket	X	X
ThumbsPlus in combination with PhotoBucket	X	X
Netflix Website in combination with PhotoBucket	X	X

v. ’091 Patent

U.S. Patent No. 11,812,091												
Combination(s)	**1**	**2**	**3**	**6**	**7**	**10**	**13**	**14**	**15**	**16**	**17**	**20**
Phillips, Wallis	x		x	x	x		x	x	x		x	x
Phillips, Wallis, Logan	x		x	x	x		x	x	x		x	x
Phillips-Wallis combinations, Uchida	x	x	x	x	x	x	x	x	x	x	x	x
Phillips, Wallis, Ellis ’040	x		x	x	x		x	x	x		x	x
Phillips, Wallis, Logan, Ellis ’040	x		x	x	x		x	x	x		x	x
Ellis ’430, Wallis	x		x	x	x			x	x	x	x	
Ellis ’430, Wallis, Uchida	x	x	x	x	x	x	x	x	x	x	x	x
TiVo System in view of the knowledge of a person of ordinary skill in the art	x		x	x	x	x	x	x	x	x	x	x
Replay TV System in view of the knowledge of a person of ordinary skill in the art	x	x	x	x	x	x	x	x	x	x	x	x
Time Warner Full Service Network System in view of the knowledge of a person of ordinary skill in the art	x	x	x	x	x	x	x	x	x	x	x	x
Comcast VoD/DVR System in view of the knowledge of a person of ordinary skill in the art	x	x	x	x	x	x	x	x	x	x	x	x
AOL TV System in view of the knowledge of a person of ordinary skill in the art	x		x	x	x	x	x	x	x	x	x	x
Microsoft Web TV System in view of the knowledge of a person of ordinary skill in the art	x	x	x	x	x	x	x	x	x	x	x	x
RealPlayer System in view of the knowledge of a person of ordinary skill in the art	x		x	x	x	x	x	x	x	x	x	x
Each System art listed above in view of every other system art listed above	x	x	x	x	x	x	x	x	x	x	x	x

vi. ’645 Patent

U.S. Patent No. 7,952,645								
Combination(s)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Kim + DNIe	X	X	X	X	X	X	X	X
Kim + Fujimura	X	X	X	X	X	X	X	X
Fujimura + DNIe	X	X	X	X	X	X	X	X
Kim + Fujimura + DNIe	X	X	X	X	X	X	X	X

vii. ’950 Patent

U.S. Patent No. 8,471,950										
Combination(s)	**1**	**2**	**3**	**4**	**5**	**7**	**8**	**10**	**12**	**14**
Tsujino + Iwasaki	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shi 2004	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Shi 2004	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Shi 2004	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shi 2004 + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shi 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Shi 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Shi 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X

U.S. Patent No. 8,471,950										
Combination(s)	**1**	**2**	**3**	**4**	**5**	**7**	**8**	**10**	**12**	**14**
Tsujino + Iwasaki + Shi 2004 + Aptina + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Shi 2004 + Aptina + Yu 2004 + Nourani-Vatani 2007	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Aptina + Olympus	X	X	X	X	X	X	X	X	X	X
Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Aptina + Olympus + Canon + Nikon	X	X	X	X	X	X	X	X	X	X
Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Yu 2004 + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina	X	X	X	X	X	X	X	X	X	
Shi 2004 + Yu 2004 + Nourani-Vatani 2007 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Aptina	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Aptina	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Tsujino + Shui + Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Iwasaki + Shui + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Tsujino + Iwasaki + Shui + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Aptina + Olympus	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Aptina + Olympus + Canon	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Aptina + Olympus + Canon + Nikon	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Aptina + Olympus + Canon + Nikon + Minolta	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Tsujino + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Iwasaki + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Shui + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Tsujino + Iwasaki + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Tsujino + Shui + Aptina	X	X	X	X	X	X	X	X	X	X

U.S. Patent No. 8,471,950										
Combination(s)	**1**	**2**	**3**	**4**	**5**	**7**	**8**	**10**	**12**	**14**
Shi 2004 + Iwasaki + Shui + Aptina	X	X	X	X	X	X	X	X	X	X
Shi 2004 + Tsujino + Iwasaki + Shui + Aptina	X	X	X	X	X	X	X	X	X	X

viii. ’228 Patent

U.S. Patent No. 10,783,228								
Combination(s)	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**
Aminzade + Soli	X	X	X	X	X	X		
Aminzade + Sowers	X	X	X	X	X	X		
Aminzade + Soli + Altman	X	X	X	X	X	X	X	X
Aminzade + Sowers + Altman	X	X	X	X	X	X	X	X
Aminzade + Soli + Huang	X	X	X	X	X	X	X	X
Aminzade + Sowers + Huang	X	X	X	X	X	X	X	X
Boettcher + Soli	X	X	X	X	X	X		
Boettcher + Sowers	X	X	X	X	X	X		
Boettcher + Soli + Altman	X	X	X	X	X	X	X	X
Boettcher + Sowers + Altman	X	X	X	X	X	X	X	X
Boettcher + Soli + Huang	X	X	X	X	X	X	X	X
Boettcher + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Aminzade + Soli	X	X	X	X	X	X		
Samsung Gear 2 + Aminzade + Sowers	X	X	X	X	X	X		
Samsung Gear 2 + Aminzade + Soli + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Aminzade + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Aminzade + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Aminzade + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Boettcher + Soli	X	X	X	X	X	X		
Samsung Gear 2 + Boettcher + Sowers	X	X	X	X	X	X		
Samsung Gear 2 + Boettcher + Soli + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Boettcher + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Boettcher + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Boettcher + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Soli	X	X	X	X	X	X		
Samsung Galaxy S5 + Aminzade + Sowers	X	X	X	X	X	X		
Samsung Galaxy S5 + Aminzade + Soli + Altman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Soli	X	X	X	X	X	X		
Samsung Galaxy S5 + Boettcher + Sowers	X	X	X	X	X	X		
Samsung Galaxy S5 + Boettcher + Soli + Altman	X	X	X	X	X	X	X	X

U.S. Patent No. 10,783,228								
Combination(s)	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**
Samsung Galaxy S5 + Boettcher + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Sowers	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Soli	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers + Altman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli + Huang	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers + Huang	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Soli + Westerman	X	X	X	X	X	X		
Samsung Galaxy S5 + Aminzade + Sowers + Westerman	X	X	X	X	X	X		
Samsung Galaxy S5 + Aminzade + Soli + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Sowers + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Soli + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Aminzade + Sowers + Huang + Westerman	X	X	X	X	X	X	X	X

U.S. Patent No. 10,783,228								
Combination(s)	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**
Samsung Galaxy S5 + Boettcher + Soli + Westerman	X	X	X	X	X	X		
Samsung Galaxy S5 + Boettcher + Sowers + Westerman	X	X	X	X	X	X		
Samsung Galaxy S5 + Boettcher + Soli + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Sowers + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Soli + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Galaxy S5 + Boettcher + Sowers + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Sowers + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Soli + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Westerman + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli + Westerman	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers + Westerman	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Soli + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Aminzade + Sowers + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli + Westerman	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers + Westerman	X	X	X	X	X	X		
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli + Altman + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers + Altman + Westerman	X	X	X	X	X	X	X	X

U.S. Patent No. 10,783,228								
Combination(s)	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Soli + Huang + Westerman	X	X	X	X	X	X	X	X
Samsung Gear 2 + Samsung Galaxy S5 + Boettcher + Sowers + Huang + Westerman	X	X	X	X	X	X	X	X

ix. ’646 Patent

U.S. Patent No. 10,812,646									
Combination(s)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**11**
Esaka ’217 + Guihot ’251	X	X	X				X		
Esaka ’217 + Guihot ’251 + Bandyopadhyay ’247	X	X	X	X	X	X	X		
Esaka ’217 + Guihot ’251 + Sharif-Ahmadi ’343	X	X	X				X	X	X
iPhone 4S + Son + Yano	X	X	X	X	X	X	X		
iPhone 4S + Yu	X	X	X				X	X	X
HTC One + Son + Yano	X	X	X	X	X	X	X		
HTC One + Yu	X	X	X				X	X	X
Nexus 7 + Son + Yano	X	X	X	X	X	X	X		
Nexus 7 + Yu	X	X	X				X	X	X
Galaxy Note Pro + Son + Yano	X	X	X	X	X	X	X		
Galaxy Note Pro + Yu	X	X	X				X	X	X
Galaxy S5 + Son + Yano	X	X	X	X	X	X	X		
Galaxy S5 + Yu	X	X	X				X	X	X
Galaxy S5 Sport + Son + Yano	X	X	X	X	X	X	X		
Galaxy S5 Sport + Yu	X	X	X				X	X	X
Galaxy S4 + Son + Yano	X	X	X	X	X	X	X		
Galaxy S4 + Yu	X	X	X				X	X	X
Galaxy S3 + Son + Yano	X	X	X	X	X	X	X		
Galaxy S3 + Yu	X	X	X				X	X	X

x. ’681 Patent

U.S. Patent No. 12,160,681						
Combination(s)	**1**	**2**	**3**	**4**	**5**	**7**
Funabiki + Guo			x			
E-DDC Standard + Fastert	x	x		x	x	x
Anderson + Guo			x			
Anderson + E-DDC				x	x	
E-DDC Standard + ECMA Standard	x	x		x	x	x

b. Specific Motivations to Combine

In addition to the information contained in this section and elsewhere in these contentions, including the claim charts attached as Exhibits hereto, Defendants hereby identify these additional combinations, motivations and reasons to combine.

i. ’088 Patent

One of ordinary skill in the art would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

A POSITA would have found it obvious, and would have been capable of modifying and motivated to modify, Iwami’s communication system, and individual elements thereof and/or actions performed by those elements, by the teachings of Kim and/or the knowledge of a POSITA. Both references are analogous art from the same field of endeavor and are reasonably pertinent to some of the particular problems to which Iwami and Kim are directed, including problems relating to media transmission and display in a network environment.

More specifically, the second embodiment of Iwami is a communication system where information processing devices can send image data to an information processing device connected to a display device that displays the image data. A control device manages connections between information processing devices. The control device can send information to an information processing device that causes the information processing device to change the size and/or position of images from information processing devices. Similarly, Kim describes a multicast streaming service where a media server sends media data to one or more media renderers that display the media data. A control point manages connections between the media server and media renderers that display the media data, including sending commands to start and/or stop video play and/or transmission.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
72 of 191

Iwami generally teaches that the connections between information processing devices are formed, maintained, and/or terminated according to permission from the control device. Kim describes specific systems, messages, and signal sequences by which the control point can grant and/or revoke permission for connections between the media server sends media data to one or more media renderers.

Iwami demonstrates the desirability of permission for connection control, but arguably does not clearly describe a technical process for permissions-based connection management. A POSITA would have been motivated to implement elements of the Kim permission technique as one mechanism by which the control device of Iwami can manage connections between information processing devices and/or to implement commands and/or messaging of the type discussed by Kim as one mechanism by which the control device of Iwami can control display operations of an information processing device. The decision to do so would have simply involved combining known prior art elements (i.e., the communication system elements of Iwami) according to known methods (i.e., the messaging described by Kim) to yield predictable results (i.e., a communication system whose elements can communicate with one another, or not, based on permission or lack thereof and exchange command messages with one another). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because Kim supplies a complete description of a technique for granting and revoking connection permission and display operation control that is compatible with the communication system of Iwami, and because implementing Kim's message-based techniques in Iwami's system would involve no more than ordinary skill.

A POSITA would have found it obvious, and would have been capable of modifying and motivated to modify, Jaynes's system, and individual elements thereof and/or actions performed

Maxell, Ltd.
Ex. 2015
IPR2025-01313
73 of 191

by those elements, by the teachings of Acharya and/or the knowledge of a POSITA. Both references are analogous art from the same field of endeavor and are reasonably pertinent to some of the particular problems to which Jaynes and Acharya are directed, including problems relating to media transmission and display in a network environment.

More specifically, Jaynes describes a system where multiple clients can control a shared display device, even describing how one client can manipulate data originating from another client. Jaynes generally teaches how the connections between clients and the shared display device are formed and how clients can operate individually and/or simultaneously to control what is displayed by the shared display device and how it is displayed. Similarly, Acharya describes how individual computing devices connecting to a shared display can interact with one another and/or with the shared display, including, for example, a moderated multi-user mode where one device can manage connections by other devices, including granting or terminating connection permissions.

Jaynes generally teaches that the connections between information processing devices are formed and maintained and how control can be shared among devices. Acharya describes specific moderation and/or permission techniques enabling one device to grant connection permissions to another and/or terminate connection permissions of another.

Jaynes describes how multiple clients can control the shared display device, even describing how one client can manipulate data originating from another client, but arguably does not clearly describe how to manage multiple client connections to determine which client has priority in controlling the shared display device and/or determining which clients are allowed to connect to the shared display device. A POSITA would have been motivated to implement elements of the Acharya moderation and/or permission technique as one mechanism by which

Maxell, Ltd.
Ex. 2015
IPR2025-01313
74 of 191

the system of Jaynes can manage connections and interactions among clients and the shared display device. The decision to do so would have simply involved combining known prior art elements (i.e., the system elements of Jaynes) according to known methods (i.e., the control mode(s) described by Acharya) to yield predictable results (i.e., a communication system whose elements can communicate with one another, or not, based on permission or lack thereof). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because Acharya supplies a complete description of a technique for granting and revoking connection permission that is compatible with the system of Jaynes, and because implementing Acharya's permissions techniques in Jaynes's system would involve no more than ordinary skill.

ii. '650 Patent

One of ordinary skill in the art would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

A POSITA would have been motivated to modify the teachings of Futa based on the teachings of McClellan because Futa discloses components – broadcast receiving device 10 and data-communication controlling device 40 – that function as a main terminal and McClellan discloses a main terminal in the form a multi-media computer otherwise referred to as a set-top box. *See* McClellan, 1:64-66 ("computer/decoders for the interactive television systems have become known as set top boxes"), 2:46-58. It was well-known in the art, as of the alleged date of the invention of the '650 patent, that set-top boxes function as general purpose computers with the extra functionality of a TV tuner. *See, e.g.,* Cooper, ¶11 ("Set-top box essentially has the same basic components as the general purpose computer illustrated in FIG. 1, except that it also includes a TV tuner for receiving broadcast and/or cable TV signals"). From this, a POSITA

Maxell, Ltd.
Ex. 2015
IPR2025-01313
75 of 191

would have been motivated by the teachings of McClellan to incorporate Futa's broadcast receiving device 10 and data-communication controlling device 40 into a television because Futa's broadcast receiving device and data-communication controlling device 40 collectively function as a set top box as known in the art. *See* Futa, ¶53 ("broadcast receiving device 10 functions as a server"), ¶¶277-280, ¶56 ("receiving unit 101 includes an antenna, and receives, via the antenna, a digital broadcast wave that is broadcasted from the broadcast device 60 via the broadcast satellite 80"), FIG. 2. Such a combination involves the simple application/use of well-known components (i.e., broadcast receiving device 10, data-communication controlling device 40) into a television system (i.e., McClellan's television system) to obtain predictable results (i.e., providing consumers with a television system that includes an integrated set top box). A POSITA would have had a reasonable expectation of success in making the proposed combination given the teachings of Futa and McClellan, as guided by Cooper. Such a combination would have required minimal modifications to Futa, and thus would have been well within the skillset of a POSITA. The proposed combination would not have required undue experimentation and would have yielded predictable results.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify, Sugimoto's system, and individual elements thereof and/or actions performed by those elements, by the teachings of one or more of Shindo, Sasaki, Futa, McClellan, and/or Cooper. Each of Shindo, Sasaki, Futa, McClellan, and Cooper are analogous art from the same field of endeavor as the '650 patent and themselves and are reasonably pertinent to some of the particular problems to which Sugimoto is directed, including problems related to media transmission and display in a network environment.

More specifically, Sugimoto describes a networked bookmarking system that enables a user to stop playback of stored content on one device and resume from the same position on another device. Shindo discloses a contents reproducing system whereby content displayed on a first display device can be reproduced and viewed on a second display device. *See* Shindo, ¶19 ("FIG. 1 is a block diagram showing the overall configuration of a linked display system…composed of an accumulation display device as a main display device, and mobile information terminals A and B as sub-display devices that receive program content from the accumulation display device"). Sasaki discloses a system whereby a main device in the form of a PC home server provides secondary devices in the form of mobile information terminals with content. *See* Sasaki, ¶138 ("When it is determined in step S322 that a distribution start request has been received, the CPU 101 reads the content segment data from the distribution data memory 111 and transmits it to the PDA2 via the communication module"). Futa discloses a content distributing system that distributes content to users through a television or personal computer. *See* Futa, ¶49 ("FIG. 1 shows the construction of the content distributing," which includes "broadcast receiving device 10, a TV (television) 20, a PC (personal computer) 30, a data-communication controlling device 40, a table updating server 50, and a broadcast device 60"). McClellan discloses an interactive television system that includes a set-top box incorporated inside a television. *See* McClellan, 1:26-27 ("set top boxes for use in an interactive television system"). Cooper discloses an interactive television system whereby users can remotely notify other users about what they are viewing on their televisions. *See* Cooper, abstract. In other words, each reference discloses an interactive content delivery system whereby content, such as television content, movie content, streaming content, or content related to

Maxell, Ltd.
Ex. 2015
IPR2025-01313
77 of 191

television content, movie content, and streaming content, is delivered from one device to another.

Sugimoto generally describes how users can interact with the main television system in a manner that allows for the playback of content from a bookmarked position on a secondary device that is not the main television content. Each of Shindo, Sasaki, and Futa discloses the ability to deliver the content to the secondary device from the main television instead of going through an intermediary server system. A POSITA would have been motivated to implement the device-to-device communication techniques of Shindo, Sasaki, and Futa into Sugimoto's system to allow for direct device-to-device communication between Sugimoto's television system and the user devices. The decision to do so would have simply involved combining known prior art elements (i.e., the system elements of Sugimoto) according to known methods (i.e., the direct communication methods described by Shindo, Sasaki, and Futa) to yield predictable results (i.e., a communication system whereby a subsidiary display device can request the playback of content directly from the main display device). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because such direct communication would involve no more than ordinary skill.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify, any of Shindo's, Sasaki's, Futa's, Sugimoto's, Staunton's, Bloebaum's, or SynchronEyes's systems, and individual elements thereof and/or actions performed by those elements, by the teachings of one or more of Z-Wave Protocol, IEEE Std. 802.15.4, or Zigbee Specification. Each of Z-Wave Protocol, IEEE Std. 802.15.4, and Zigbee Specification are analogous art from the same field of endeavor as the '650 patent and themselves and are reasonably pertinent to some of the particular problems to which Shindo,

Maxell, Ltd.
Ex. 2015
IPR2025-01313
78 of 191

Sasaki, Futa, Sugimoto, Staunton, Bloebaum, SynchronEyes are directed, including problems related to wireless transmission of content.

Z-Wave Protocol generally describes the Z-wave Radio Frequency Protocol used to communicate between nodes in a Z-wave System. *See* Z-Wave Protocol Overview, 5. The Z-Wave protocol involves identifiers associated with each node in a Z-wave network that are stored on each respective device and used for the transmission of messages among nodes to a Z-wave network. *See* Z-Wave Protocol Overview, 6-9, 12-13, 16. IEEE Std. 802.15.4 generally describes the 802.15.4 standard that defines the protocol and interconnection of devices via radio communication in a personal area network (PAN). IEEE Std. 802.15.4, 4. The IEEE Std. 802.15.4 discloses that each device to a PAN has a unique address stored on each respective device used for directly communicating with other nodes in the PAN. IEEE Std. 802.15.4, 14. ZigBee Specification generally describes the ZigBee communication standard. *See* ZigBee Specification, 17. ZigBee specification discloses that each device to a ZigBee network has a unique address stored on each respective device and used for the transmission of messages among nodes to the ZigBee network. *See* ZigBee Specification, 30-35, 88-98, 176-181, 195, 211-217. Each of Shindo, Futa, Sugimoto, Staunton, Bloebaum, and SynchronEyes discloses a computing environment whereby the communication among devices is wireless. *See* Shindo, FIG. 2 (showing "Network" facilitating communication among stand alone display device 1 and mobile information terminals A-B), Sasaki, ¶41 ("the PC home server device 1 and the PDA 2 are connected by a LAN (Local Area Network) within the home. The LAN can of course be configured as a wired LAN, but in this embodiment, as described later, a communication module such as Bluetooth (registered trademark) is used to configure a wireless LAN"), Futa, ¶258 ("the present invention also includes the construction where each device belonging to the home

Maxell, Ltd.
Ex. 2015
IPR2025-01313
79 of 191

network communicates with one another via a wireless LAN), Sugimoto, FIG. 2 (showing client 1 and client 61 communicating with wireless LAN), Staunton, ¶47 ("Transmission: The XML description of the requested information is transmitted wirelessly to the remote device. This can be achieved by using any number of existing wireless protocols known in the technical field of the invention. For example, Bluetooth, IEEE 802.11 or HomeRF"), Bloebaum, ¶23 ("The secondary device transceiver 225 is a shorter range wireless transport protocol such as Bluetooth™, 802.11x, WiFi, Ultrawide Band (wireless USB), or the like."), SynchronEyes, 10 (showing communication via 802.11 a/b/g access points).

In other words, each of Z-Wave Protocol, IEEE Std. 802.15.4, and ZigBee Specification discloses an exemplary protocol for wireless transmitting information in a local area network. Each of Shindo, Sasaki, Futa, Sugimoto, Staunton, Bloebaum, SynchronEyes discloses a computing environment for the purposes of transmitting content wirelessly in a local area network. A POSITA would have been motivated to implement the protocols in Z-Wave Protocol, IEEE Std. 802.15.4, and/or ZigBee Specification, including the device identifiers, into the systems of Shindo, Sasaki, Futa, Sugimoto, Staunton, Bloebaum, SynchronEyes. The decision to do so would have simply involved combining known prior art elements (i.e., known protocols – Z-Wave, 802.15.4, ZigBee) according to known methods (i.e., implementation in wireless computing environments) to yield predictable results (i.e., transmission of content in accordance with a specific protocol). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because such change in protocol would involve no more than ordinary skill.A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify, Kamimaki and individual elements thereof and/or actions performed by those elements, by the teachings of one or more of Shindo or Sasaki. Each

of Shindo and Sasaki are analogous art from the same field of endeavor as the ’650 patent and themselves and are reasonably pertinent to some of the particular problems to which Kamimaki is directed, including problems related to wireless transmission of content.

Kamimaki generally describes a wireless communication network, whereby a main terminal sends content to subsidiary terminals. *See* Kamimaki, Abstract (“A contents receiving system uses a digital broadcast wave or a broadband network to enable a user to suitably view main content, and provide a user with subsidiary content information desired by the user.”) Shindo and Sasaki generally describe wireless communication systems whereby a main terminal sends content to subsidiary terminals. *See* Shindo, ¶19 (“FIG. 1 is a block diagram showing the overall configuration of a linked display system…composed of an accumulation display device as a main display device, and mobile information terminals A and B as sub-display devices that receive program content from the accumulation display device”). Sasaki discloses a system whereby a main device in the form of a PC home server provides secondary devices in the form of mobile information terminals with content. *See* Sasaki, ¶138 (“When it is determined in step S322 that a distribution start request has been received, the CPU 101 reads the content segment data from the distribution data memory 111 and transmits it to the PDA2 via the communication module”). A POSITA would have been motivated to implement the content sharing techniques in Shindo and Sasaki, into the system of Kamimaki. The decision to do so would have simply involved combining known prior art elements (i.e., sending a type of content) according to known methods (i.e., implementation in wireless computing environments) to yield predictable results (i.e., transmission of a specific type of content in wireless networks). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because such change in the type of content would involve no more than ordinary skill.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify Sega OutRun2 System, and individual elements thereof and/or actions performed by those elements, by the teachings of one or more of Z-Wave Protocol, IEEE Std. 802.15.4, or Zigbee Specification. Each of Z-Wave Protocol, IEEE Std. 802.15.4, and Zigbee Specification are analogous art from the same field of endeavor as the ’650 patent and themselves and are reasonably pertinent to some of the particular problems to which Sega OutRun2 System is directed, including problems related to wireless transmission of content.

Z-Wave Protocol generally describes the Z-Wave Radio Frequency Protocol used to communicate between nodes in a Z-wave System. *See* Z-Wave Protocol Overview, 5. The Z-Wave protocol involves identifiers associated with each node in a Z-wave network that are stored on each respective device and used for the transmission of messages among nodes to a Z-wave network. *See* Z-Wave Protocol Overview, 6-9, 12-13, 16. IEEE Std. 802.15.4 generally describes the 802.15.4 standard that defines the protocol and interconnection of devices via radio communication in a personal area network (PAN). IEEE Std. 802.15.4, 4. The IEEE Std. 802.15.4 discloses that each device to a PAN has a unique address stored on each respective device used for directly communicating with other nodes in the PAN. IEEE Std. 802.15.4, 14. ZigBee Specification generally describes the ZigBee communication standard. *See* ZigBee Specification, 17. ZigBee specification discloses that each device to a ZigBee network has a unique address stored on each respective device and used for the transmission of messages among nodes to the ZigBee network. *See* ZigBee Specification, 30-35, 88-98, 176-181, 195, 211-217. Sega OutRun2 System discloses a computing environment whereby content is communicated across connected cabinets. *See generally,* Sega OutRun2 System. In other words, each of Z-Wave Protocol, IEEE Std. 802.15.4, and ZigBee Specification discloses an exemplary

Maxell, Ltd.
Ex. 2015
IPR2025-01313
82 of 191

protocol for wirelessly transmitting content in a local area network. Sega OutRun2 System discloses a computing environment in which content is transmitted between devices or cabinets. A POSITA would have been motivated to implement the protocols in Z-Wave Protocol, IEEE Std. 802.15.4, and/or ZigBee Specification, including the device identifiers, into the Sega OutRun2 System. The decision to do so would have simply involved combining known prior art elements (i.e., known protocols – Z-Wave, 802.15.4, ZigBee) according to known methods (i.e., implementation content transmitting computing environment) to yield predictable results (i.e., wireless transmission of content in accordance with a specific protocol). A POSITA would have understood that there would have been a reasonable expectation of success in doing so, because such change would involve no more than ordinary skill.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify Samsung Quick Share system, and individual elements thereof and/or actions performed by those elements, by the teachings of IEEE Std. 802.11n. In particular, it would have been obvious to modify Samsung Quick Share system to use Ethernet. Ethernet is a well-established networking technology that, like wireless 802.11, assigns a unique MAC address to every device on the network. By the time of the Samsung Quick Share system, Ethernet was widely used for connecting computers and consumer electronics in home and enterprise environments. The Samsung Quick Share system is expressly compatible with both wired Ethernet and wireless 802.11 networking, and the system is designed to aggregate and manage subsidiary terminals regardless of the underlying physical connection.

A POSITA would have recognized that Ethernet provides reliable, high-bandwidth connectivity and uses the same principles of device identification and management as wireless LANs. The use of Ethernet MAC addresses for device-specific identification information is

standard practice in networked systems, and the Samsung Quick Share system's architecture and management software are agnostic to whether the subsidiary terminals are connected via Ethernet or wireless. Therefore, it would have been obvious to implement the storage and management of device-specific identification information for subsidiary terminals using Ethernet MAC addresses, just as with wireless MAC addresses, further supporting that the first controller is configured to store a plurality of device-specific ID information for the subsidiary terminals.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify Quake III Arena system, and individual elements thereof and/or actions performed by those elements, by the teachings of IEEE Std. 802.11n. In particular, it would have been obvious to modify Quake III Arena system to use Ethernet. Ethernet is a well-established networking technology that, like wireless 802.11, assigns a unique MAC address to every device on the network. By the time of the Quake III Arena system, Ethernet was widely used for connecting computers and consumer electronics in home and enterprise environments. The Quake III Arena system is expressly compatible with both wired Ethernet and wireless 802.11 networking, and the system is designed to aggregate and manage subsidiary terminals regardless of the underlying physical connection.

A POSITA would have recognized that Ethernet provides reliable, high-bandwidth connectivity and uses the same principles of device identification and management as wireless LANs. The use of Ethernet MAC addresses for device-specific identification information is standard practice in networked systems, and the Quake III Arena system's architecture and management software are agnostic to whether the subsidiary terminals are connected via Ethernet or wireless. Therefore, it would have been obvious to implement the storage and management of device-specific identification information for subsidiary terminals using Ethernet

MAC addresses, just as with wireless MAC addresses, further supporting that the first controller is configured to store a plurality of device-specific ID information for the subsidiary terminals.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify Apple AirDrop system, and individual elements thereof and/or actions performed by those elements, by the teachings of IEEE Std. 802.11n. In particular, it would have been obvious to modify Apple AirDrop system to use Ethernet. Ethernet is a well-established networking technology that, like wireless 802.11, assigns a unique MAC address to every device on the network. By the time of the Apple AirDrop system, Ethernet was widely used for connecting computers and consumer electronics in home and enterprise environments. The Apple AirDrop system is expressly compatible with both wired Ethernet and wireless 802.11 networking, and the system is designed to aggregate and manage subsidiary terminals regardless of the underlying physical connection.

A POSITA would have recognized that Ethernet provides reliable, high-bandwidth connectivity and uses the same principles of device identification and management as wireless LANs. The use of Ethernet MAC addresses for device-specific identification information is standard practice in networked systems, and the Apple AirDrop system's architecture and management software are agnostic to whether the subsidiary terminals are connected via Ethernet or wireless. Therefore, it would have been obvious to implement the storage and management of device-specific identification information for subsidiary terminals using Ethernet MAC addresses, just as with wireless MAC addresses, further supporting that the first controller is configured to store a plurality of device-specific ID information for the subsidiary terminals.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
85 of 191

iii. ’417 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

<u>Belt + Foster + Norris</u>

Claim [1b]

Norris discloses “a computer system comprising a clock generator circuit having a clock speed register and circuitry for generating a processor clock signal at a frequency determined by the clock speed register.” Norris, 2:43-58; Abstract, 3:58-63 (“clock generator circuit 14 generates a processor clock 32 for the processor 12”), Fig. 1.

Norris further discloses its computer system 10 also comprises “a performance manager 44” which is executable software that “processes requests from application programs 50 and 52 to change the performance state for the processor 12.” 4:48-56, Fig. 2.

Performance manager 44, in response to a request for the processor to enter either a high, medium, or low performance state, determines “the processor clock 32 frequencies that correspond to the high, medium and low performance states of the processor 12” and then “invokes the routines of the clock generator driver 42 to program the clock speed register 34 for the specified frequency of the processor clock 32.” 4:57-5:4.

It would have been obvious to a POSITA to combine the teachings of Belt and Norris to arrange Belt’s clock generator 31 and/or speed control register 32 outside of Belt’s main processor 11, as taught by Norris, so that the clock signal generated by clock generator 31 is externally fed to the main processor 11.

Belt and Norris are directed to the same field of endeavor and are analogous prior art to the ’417 patent since each relates to power management techniques for portable computer

Maxell, Ltd.
Ex. 2015
IPR2025-01313
86 of 191

systems that balance performance and battery life by dynamically adjusting a processor's clock speed. *See* 417 patent, 1:32-40 ("if the CPU is driven at a high frequency, there has been a tendency toward an increase in current consumption although a processing speed is enhanced" which causes "risk of premature depletion of the battery capacity occurring when the clock signal has been automatically switched over to the high-speed side without knowledge of the user."); Belt, 3:8-14 ("clocks can be set to a higher speed when rapid processing is required despite the fact that a larger amount of power is drawn from the system battery during a given time period, whereas when processing speed is not critical a lower clock speed can be used in order to reduce the amount of power being drawn from the battery."); Norris, Abstract, 1:10-2:20 (explaining the problem in the art was that high clock speeds reduced battery life, but slow clock speeds degraded user performance), 2:25-27 ("One object of the present invention is manage a balance between performance and power consumption in a computer system.").

A POSITA would have understood the problem to be solved, namely, how to provide a variable frequency clock signal for a processor as disclosed in Belt for microprocessors that rely on external clock signals to operate. To overcome this problem, Norris discloses a computer system with clock generator circuit 14 that is external to the processor 12, wherein the clock signal 32 is fed (from the external source) to the processor 12. Norris, 3:58-63, Fig. 1. Doing so reflects a design choice regarding whether the source of the clock signals is located in the processor or external to the processor. A POSITA would have been motivated to implement the solution of Norris in the Belt device so that the invention of Belt could be implemented using microprocessors that are designed to operate using clock signals that are externally fed to the processor. Indeed, because Belt teaches that its clock generator and speed control register not only respectively generates and controls a clock signal for the processor, but also for "various

components of the system" (Belt, 3:1-5), a POSITA would have found arranging the clock generator 31 and/or speed control register 32 outside the processor to be an obvious and necessary design choice when such components are not included within a processor.

A POSITA would have had a reasonable expectation of success in combining the teachings of Belt and Norris as both references disclose a computer architecture arrangement in which software, in conjunction, with a control register, is capable of changing the frequency of the clock supplied to a processor. Implementing Norris's teaching of an external (to the processor) control register and clock generator in Belt's laptop computer system 10 involves modifications of only routine skill in the art. Moreover, modifying Belt as described above would have involved known methods of chip design and therefore, would have yielded predictable results.

Claim [1c]

It would have been obvious to a POSITA to combine the teachings of Belt and Foster to modify Belt to enter, when the lid of laptop computer system 10 is closed, an idle mode such that a lower frequency clock signal (relative to the clock frequency when the lid is open) is fed to Belt's main processor.

Belt and Foster are directed to the same field of endeavor and are analogous prior art to the '417 patent since each relates to performance-based processor clocking power management techniques for portable computer systems. Foster, 19:9-11 ("Power consumption within the processor 311 is dependent on its clock speed, and in particular is lower for lower clock speeds."), 28:11-18 ("In a situation where the user is operating on battery power and is running a program which does not require fast processor speed, intentionally reducing the processor speed will reduce power consumption and thus permit the user to operate the system longer before the

battery requires recharging.”). Notably, Belt incorporates by reference U.S. App. No. 07/752,342, the application to which Foster claims priority as a continuation thereof. Belt, 2:57-63; Foster, 1:6-7.[4]

As set forth in Foster, a POSITA would have understood the problem of Belt’s suspend mode was that it would take longer to exit from that suspend mode into a run mode, which would perceptibly degrade performance. Foster, 79:61-80:17. To overcome this problem, Foster expressly discloses the solution of an “idle mode” in which “the CPU clock is slowed significantly” from 20 Mhz to 5Hz. *See* Foster, 79:61-80:1. A POSITA would have been motivated to implement Foster’s idle mode in lieu of Belt’s suspend mode because, as disclosed in Foster, the idle mode “is much simpler than the suspend or standby modes” and doing so would make it “possible [for the computer system] to resume to run mode in a shorter time than required for the other modes.” *Id.*, 79:61-80:17.

A POSITA would have had a reasonable expectation of success in making this modification since Belt and Foster’s computer systems are substantively similar and each are based on the Intel 386SL. Implementing Foster’s idle mode in lieu of Belt’s suspend mode involves modifications of only routine skill in the art. Moreover, modifying Belt as described above would have involved known programming methods and therefore, would have yielded predictable results.

Claim [1d]

It would have been obvious to a POSITA to further combine the teachings of Belt and Foster to modify Belt’s incoming call procedure when the lid is closed with that of Foster’s so

[4] Based on this incorporation by reference, Belt and Foster may be considered a single reference.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
89 of 191

that the clock frequency of Belt's main processor increases so that incoming characters from a serial line or from a telephone line can be processed and not lost.

Belt and Foster are analogous prior art to the '417 patent for the reasons set forth in limitation 1[c]. A POSTIA would have understood that the problem with Belt's closed-lid/suspend mode incoming call procedure is that the incoming call information will not be processed since the system remains in suspend mode. Foster, 60:10-20. A POSITA would therefore have been motivated to implement Foster's suspend mode incoming call procedure in Belt so that Belt's processor 11 is returned to "its normal mode of functioning" so that "incoming characters from a serial line or from a telephone lines [are not] lost" and after processing the call, returning to idle mode to further conserve battery. Foster, 60:10-20.

And, for the reasons set forth in limitation 1[c], a POSITA would have had a reasonable expectation of success in combining the teachings of Belt and Foster as both references disclose substantively similar computer architectures, and both disclose an incoming call procedure as noted above. Modifying Belt's closed-lid/suspend mode incoming call procedure with Foster's suspend mode incoming call procedure would have involved known programming techniques and therefore, would have yielded predictable results.

Claim 2

Foster discloses that "[w]hen the processor detects one of several special multi-key combinations [from the internal keyboard], it actuates the EXTPMI line to the main processor," (i.e., "a request from the user") which initiates a PMI, "so that any program in progress is immediately interrupted, a special function is carried out" (i.e., "the specific processing). *See* Foster, 27:61-28:10, 39:63-66 ("a HK bit which indicates that a hot key multi-key combination has been pressed on the keyboard and was the reason for the PMI.").

Maxell, Ltd.
Ex. 2015
IPR2025-01313
90 of 191

With respect to an external keyboard, although Foster discloses that "[h]ot keys are recognized only for the internal keyboard and not an external keyboard" and that "[i]f a hot key actuation were received from an external keyboard, it *could* be discarded" (Foster, 41:60-63), a POSITA would have understood that the external keyboard hot key could also not be discarded, which would be advantageous when the external keyboard is primarily being used. Indeed, Foster discloses that an external keyboard or mouse can send information to the SCP such that it "executes the interrupt service routine shown in Fig. 30." Foster, 41:44-48, 42:1-9 (recognizing external mouse actuation), 71:43-67 (external keyboard interrupt handler routine).

As explained previously, Belt and Foster are each analogous art to the '417 patent. *See* limitation 1[b], (describing analogousness of Belt and the '417 patent), limitation 1[c], (same re Belt, Foster, and the '417 patent).

A POSITA would have understood the problem involved, namely, the need to allow the user of the Belt device the ability to change the clock frequency when desired—including when an external keyboard is primarily being used. To overcome this problem, Foster discloses the solution of providing various mechanisms for the user to change the clock frequency as desired. A POSITA would have been motivated to implement in Belt's laptop computer system 10 of the Belt-Foster combination (with or without Norris) Foster's hot key processor speed setting which advantageously allows a user to selectively prioritize "maximum performance" to rapidly execute "processor intensive functions [] being performed" or "maximum power conservation" when the device is running on battery to prolong operational usability, or "balance between" the two. 28:13-18 ("intentionally reducing the processor speed will reduce power consumption and thus permit[s] the user to operate the system longer").

The modification to Belt could be implemented, for example, by adding Fosters hot key processor speed setting to Belt's PMI handler routine, whereby the hot key is entered through an external keyboard as taught, and rendered obvious, by Foster as described above. Indeed, as Belt discloses, the user can configure the laptop computer system 10 to remain in operation even when the lid is closed. *See* limitation 1[c]. Therefore, when the lid of laptop computer system 10 is closed, but the system remains operational and connected to an external keyboard, mouse, and display, a POSITA would have understood that the user may still use laptop computer system 10 in a conventional matter via these external peripherals and, in doing so, desire to increase or decrease the processing speed depending on the situation.

Regarding the implementation of Foster's hot key processor speed setting in Belt's laptop computer system 10, for the reasons set forth in limitation 1[c], a POSITA would have had a reasonable expectation of success in combining the teachings of Belt and Foster as both references disclose substantively similar computer architectures, and both disclose an EXTPMI as noted above. Implementing Foster's hot key processor speed setting in Belt's laptop computer system 10 would have involved known programming techniques and therefore, would have yielded predictable results.

Belt + Foster + Norris + Alberth

Claim [3]

As discussed in limitation 1[d], in the Belt-Foster combination, it would have been obvious to modify Belt's modem with the teachings of Foster's modem such that modem 22 of Belt's laptop computer system 10 processes incoming characters from a serial line or from a telephone line even when the lid of Belt's laptop computer system 10 is closed.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
92 of 191

Alberth, however, discloses "a closeable communication device 102 [that] has housing portions 110 and 112" that are moveable between an open position and a closed position. Alberth, 2:54-62; *id.*, 2:63-3:3; *see also id.*, 2:48-53 ("Although illustrated in a cellular telephone, the apparatus and method described hereinbelow will also find application in cordless telephones, two-way radios, pagers, personal digital assistants, and the like, and 'device' as used herein shall refer to each of these and their equivalents."). Alberth further discloses that the closeable communication device 102 further includes "memory 305 [which] permanently stores operating instructions and user definable information, such as caller information in the form of an electronic phone book of names and associated telephone numbers[.]" *Id.*, 4:55-58; *id.*, 4:62-65 (memory 305 may include EEPROM).

Alberth further discloses a "smart call indication" technique in which a controller—which "includes a microprocessor (not shown) for executing the operational instructions [and] processing the aforementioned received signals" (5:3-6)—"retrieves the caller identification information of the incoming call … and compares the caller identification information to caller information, such as telephone numbers, stored in the memory 305[.]" *Id.*, 7:12-18. "If a match between the caller identification information and the stored caller information is found," an indication corresponding to a found match is produced. *Id.*, 7:18-21. If no match is found, a corresponding indication is produced. *Id.*, 7:27-30. Alberth discloses that these indications may be a ringer "emitting distinctive tones" for the match found and match not found determinations. *Id.*, 7:34-39; *id.*, 8:53-56 ("The smart call feature embodied in steps 402, 424, 430, 432, 434, 436, 438, and 440 of the method of FIG. 4 provides a user with incoming call information when the housing 105 is in the closed position").

A POSITA would have understood that Alberth's "smart call indication," also referred to as caller ID, is within the scope of "address retrieval"[5] in view of the cellular phone embodiment of the '417 patent.

As explained previously, Belt, Foster, and Norris are each analogous art to the '417 patent. *See* limitation 1[b] (describing analogousness of Belt, Norris, and the '417 patent), limitation 1[c], (same re Belt, Foster, and the '417 patent). Alberth is also analogous to the '417 patent because Alberth is directed to "a closeable communication device and method of operating the same that increases the usability of the device in the closed position by, for example, supporting desirable user features and minimizing power consumption." Alberth, 1:63-67.

A POSITA would have understood the problem involved, namely, the need to allow the user of the Belt device the ability to determine when a known caller is calling Belt's device, even when in a closed condition. A POSITA would have been motivated to implement, in Belt's laptop computer system 10 in the Belt-Foster-Norris combination, Alberth's smart call indication technique to allow a user to identify, when a device is in a closed position, whether an incoming call is from a known caller. Alberth, 9:6-9 ("This allows the user to view caller identification information of the incoming call on the display 134 of the device 102, which is hidden in the closed position 200[.]"). Further, because neither Belt nor Foster teach specifically how an incoming call is processed (Foster, 77:65-78:4), a POSITA would have turned to art related to processing incoming calls, like that of Alberth, for such specifics.

[5] The phrase "address retrieval" appears only once in the '417 patent at 2:65-3:2 and merely mirrors the language in the claim.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
94 of 191

The modification to Belt could be implemented, for example, by causing Belt's speaker 57 to output a sound, as described in Norris, corresponding to a caller's phone number matching that stored in memory, as taught by Alberth. Alberth, 7:34-39.

A POSITA would have had a reasonable expectation of success in making this modification since, as noted above, Belt's modem, in view of Foster's teachings of the same, includes components and functionality similar to those described in Alberth (EEPROM memory for storing user data and incoming call processing performed by a processor). Implementing Alberth's smart call indication techniques involve modifications of only routine skill in the art. Moreover, implementing Alberth's smart call indication techniques in the Belt-Foster-Norris combination as described above would have involved known programming methods and therefore, would have yielded predictable results.

<u>Alberth + Shinmiya</u>

Claim [1b]

Alberth discloses "a closeable communication device 102 [that] has housing portions 110 and 112" that are moveable between an open position and a closed position. Alberth, 2:54-62; *id.*, 2:63-3:3; *see also id.*, 2:48-53 ("Although illustrated in a cellular telephone, the apparatus and method described hereinbelow will also find application in cordless telephones, two-way radios, pagers, personal digital assistants, and the like, and 'device' as used herein shall refer to each of these and their equivalents."). Alberth, like Shinmiya, discloses the importance of minimizing power consumption in a mobile device. Alberth, 1:10-30; Shinmiya, Abstract. However, Alberth does not specifically disclose the manner in which power consumption can be minimized. Alberth further does not expressly provide the internal architecture for its mobile device.

Shinmiya, however, discloses “A portable terminal comprising a state monitoring portion for monitoring an operating state of a microprocessor in a main control portion, and for increasing a clock frequency when the microprocessor conducts software processing in the main control portion, and for decreasing a clock frequency to supply the minimum operating clock for the microprocessor enough to operate when the microprocessor does not conducts the software processing. The present invention can save the power of the portable terminal effectively.” Shinmiya, Abstract.

Shinmiya further discloses “The main control portion 1 conducts function control processes using its own microprocessor. The following are main function control processes which the main control portion 1 conducts.

> (1) A key control process for processing a key input signal in response to the key input signal 20 from the key operating portion 2.
>
> (2) A display process for displaying a communication result and so on, by outputting the display signal 25 to the display portion 5.
>
> (3) A communication control process for instructing the transmission/reception control portion 4 to start/end the communication with outside apparatus.
>
> (4) A communication monitoring process for monitoring the communication between the transmission/reception control portion 4 and outside apparatus.

Further, the state monitoring portion 11 within the main control portion 1 conducts the following process. (5) A state monitoring process for monitoring above processes (1)˜(4).” Shinmiya, 2:16-59. To implement the state monitoring process, Shinmiya discloses an internal architecture for its mobile device. *See id.*, Fig. 1.

Accordingly, Shinmiya and Alberth are at least directed to the same field of endeavor and are analogous prior art to the ’417 patent since each relates to power management techniques for mobile devices.

A POSITA would have been motivated to implement Shinmiya's power management techniques, including Shinmiya's state monitoring processes, and its corresponding internal architecture wherein the clock supply portion is fed to the main control portion (*see* Shinmiya, Fig. 1) in Alberth to further minimize power consumption and to extend battery life, as discussed by Alberth. Alberth, 1:10-30. Further, because Alberth does not disclose its internal architecture, a POSITA would have looked to analogous art, such as Alberth, for such details. The combination reflects a simple design choice.

A POSITA would have had a reasonable expectation of success in combining the teachings of Shinmiya and Alberth as both references disclose a mobile terminal—namely, portable phones—and doing so involves modifications of only routine skill in the art.

Claim [1c], [1d], [3]

A POSITA would have motivated to combine Alberth and Shinmiya for the reasons set forth above.

Alberth discloses a "smart call indication" technique that is implemented regardless of whether the its device is in an open or closed position in which a controller—which "includes a microprocessor (not shown) for executing the operational instructions [and] processing the aforementioned received signals" (5:3-6)—"retrieves the caller identification information of the incoming call … and compares the caller identification information to caller information, such as telephone numbers, stored in the memory 305[.]" *Id.*, 7:12-18. "If a match between the caller identification information and the stored caller information is found," an indication corresponding to a found match is produced. *Id.*, 7:18-21. If no match is found, a corresponding indication is produced. *Id.*, 7:27-30. Alberth discloses that these indications may be a ringer "emitting distinctive tones" for the match found and match not found determinations. *Id.*, 7:34-

39; *id.*, 8:53-56 ("The smart call feature embodied in steps 402, 424, 430, 432, 434, 436, 438, and 440 of the method of FIG. 4 provides a user with incoming call information when the housing 105 is in the closed position"). However, Alberth does not explicitly disclose the nature of the clock frequency before, during, or after the smart call indication is executed, especially when in the closed condition.

Shinmiya discloses "a portable terminal in which its clock frequency is switched comprises a main controlling portion having a software processing portion using a microprocessor in the main controlling portion according to an interruption, a clock supply portion for supplying to the main controlling portion a clock signal which causes the microprocessor to operate, and a state monitoring portion for monitoring an operating state of the software processing portion, and wherein state monitoring portion sends a clock switching signal to the clock supply portion so that the clock supply portion sets a frequency of the clock signal to high when the software processing is being conducted and sets a frequency of the clock signal to low when the software processing is not being conducted. Preferably, the state monitoring portion shares a microprocessor with the software processing portion, and when no processing are conducted by the microprocessor for the software processing portion, the clock supply portion sets the minimum clock frequency which is enough for the state monitoring portion to operate." *E.g.*, Shinmiya, 3:51-4:6, Figs. 3, 7. Similarly, Shinmiya discloses raising the clock when its microprocessor accesses external memory. *Id.*, 4:8-21.

Accordingly, a POSITA would have understood that in the combination, when Alberth's mobile device is not communicating (i.e., no incoming call), the clock frequency would be set to "low," as taught by Shinmiya. Shinmiya, 3:51-4:21, Figs. 3, 7. On the other hand, when the mobile device initiates communications (i.e., receiving an incoming call) and determines whether

the caller information is stored in memory (i.e., smart call indication)—regardless of whether Alberth's mobile device is open or closed—the clock frequency would be set to "high," as taught by Shinmiya. *Id.*

iv. '198 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

(a) Recording and reproducing digital image information connectable to a display module and an output module that outputs to the display module

To the extent Maxell contends that any of the charted '198 references do not expressly disclose the limitations of claims 1 and 4, a POSITA would have understood the disclosures in each reference to inherently disclose these limitations, or at least render them obvious. The charted '198 references each discuss a recording and reproducing apparatus. Each recording and reproducing apparatus in each reference is expressly disclosed as having the capability to (1) capture image/video information and (2) reproduce image/video information to the user on a display. These were well-known, standard capabilities in digital image/video capture devices at the relevant time.

Digital cameras, scanners, and personal computers along with systems for collecting, managing, recording, reproducing, retrieving, and organizing images have existed for decades. Kang H and Shneiderman B (2000), "Visualization methods for personal photo collections: browsing and searching in the PhotoFinder", In IEEE International Conference on Multimedia and Expo.. Vol. 3, pp. 1539 -1542 vol.3. - https://ieeexplore.ieee.org/document/871061, at 1 (recognizing that these systems were common in 2000). With the ascent of personal computing

in the 1980s, digital photography and software management of photos quickly followed. Mainstream digital cameras were available for sale at least by 1996, when Canon launched its PowerShot 600.

Such digital cameras, a recording and reproducing apparatus, were connectable to personal computers for display. Software to manage and edit digital photos with personal computers was readily available by the mid-1990s. For example, the Microsoft Windows 95 operating system included built-in support for browsing images right in the file browser. A range of commercial software for managing and browsing digital photos was available as well. For example, at least by February 1998, ACDSee had software available that allowed users to "efficiently find and organize your images."[6] By at least July 2000, Canon offered their "ZoomBrowser EX" for Windows.[7] Thus, ordinary computer processors and software serving as output modules to output digital images to a personal computer display, from a digital camera recording device that recorded and reproduced the images, was well known in the art.

The '198 admits that such devices were well known in the art. *See* '198 patent at 1:27-34 ("A recording and reproducing apparatus (described in Japanese Patent Laid-open No. 2004-62921) is available as one means for solving the above problem."). The '198 patent further admits that such users using such devices to create playlists was also well known in the art. *See* '198 patent at 1:15-26 ("There have been increased users who save a large quantity of digital images (e.g., programs) in a recording medium for enjoyment because of the larger capacity of the medium in recent HDD recorders. In this case, the user can create a playlist and selectively reproduce only his or her favorite programs. The user can also dub his or her favorite digital

[6] https://web.archive.org/web/19980201151157/http://www.acdsee.com/acd/acdc32ft.html

[7] https://web.archive.org/web/20000711060247/http://www.powershot.com/powershot2/software/ps_pc_view.html

Maxell, Ltd.
Ex. 2015
IPR2025-01313
100 of 191

images in other recording media for save.). A POSITA would have found it obvious to modify any device(s) disclosed in the charted ’198 references to include recording and reproducing methods for image/video files, which were well-known at the relevant time and which cover the limitations of these claims. A POSITA further would have found it obvious to modify two or more devices as a single “apparatus,” as such arrangements were well known in art and well within a POSITA’s ordinary creativity and capability. See e.g., Nagaoka (“Although the various components of FIG. 2 are illustrated as discrete elements, such an illustration is for ease of explanation and it should be recognized that certain operations of the various components may be performed by the same physical device, e.g., by a microprocessor of a user's personal computer.”).

(b) Organizing images into playlists based on metadata and other “related information”

To the extent Maxell contends that any of the charted ’198 references do not expressly disclose the limitations of claims 1 and 4, a POSITA would have understood the disclosures in each reference to inherently disclose these limitations, or at least render them obvious. The charted ’198 references each discuss well-known methods of organizing images based on image metadata, such as the date, time, or location of the image. In the early 2000s timeframe, developing photo management systems including databases, tagging, and sharing was an area of rapid growth and interest in the broader research community, both academically and industrially. For example, a 1996 paper (Yagawa et al, The Digital Alburn: A Personal File-tainment System, 1996) by authors working at Hitachi described a “digital album” for browsing photos including a “multiview classification system” with “information about subjects, photo places where the photos were taken, and so on” and a conceptual model of some of the data organization. The user interface for the album supports browsing of photos including titles and place name descriptions.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
101 of 191

Id., 435. The paper goes on to explain that the digital album is based on an "object-oriented database." *Id.*, 437. And additionally, the album was also implemented on the World-Wide Web to "share pictures and video scenes between group members" using a database server.

PhotoFinder, described in a 2000 paper, supported annotation (or tagging) of photos with the names of the people in the photo. Shneiderman and Kang, Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos, 2000. It used "direct annotation" – where users could drag the name of a person from a list directly onto the photo and the system would remember the position on the photo where the label was dropped, as shown in the following figure.

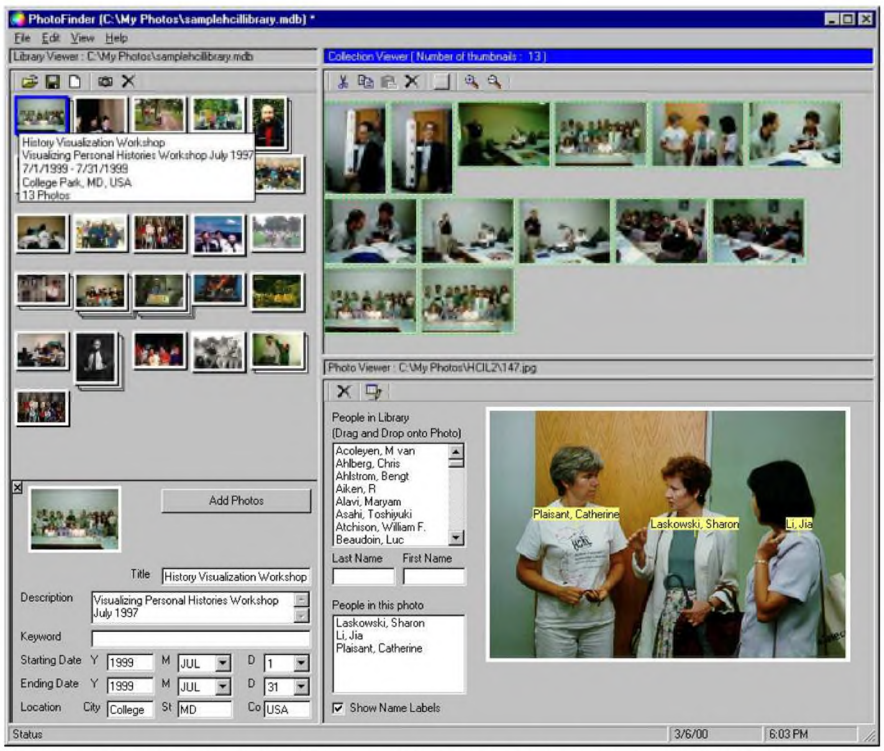


Figure 4. PhotoFinder1 display with Library Viewer on the left, Collection Viewer with thumbnails on the upper right, and Photo Viewer on the lower right.

Shneiderman and Kang, Direct Annotation: A Drag-and-Drop Strategy for Labeling Photos, 2000, 90. The paper described further additions, including that the annotations could be shared with others and the photos could be collaboratively annotated. "Another interesting issue is collaborative annotation in which multiple users working side-by-side or independently might

annotate photos and then the results could be combined, with appropriate resolution of conflicts." *Id.*, 93. The annotations were stored in a Microsoft Access database containing five linked tables. *Id.*, 93-94. PhotoFinder, as described in another paper described how selected photos could be added to a playlist for a "slide show." "The detail viewer window displays the full-size picture selected from thumbnail browser and its annotation. A slide show function is also implemented to allow users to display a set of selected pictures one after another." (Section 2.2). Kang H and Shneiderman B (2000), "Visualization methods for personal photo collections: browsing and searching in the PhotoFinder", In IEEE International Conference on Multimedia and Expo.. Vol. 3, pp. 1539 -1542 vol.3. - https://ieeexplore.ieee.org/document/871061

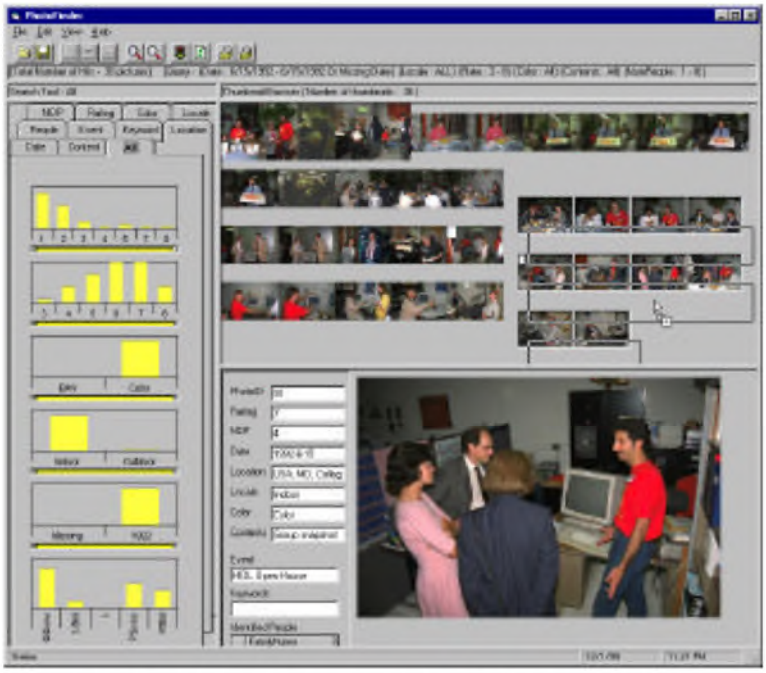


Figure 5. Drag and Drop to the Detail Viewer Window: one picture is shown in the detail viewer window, while a group selection is performed in the thumbnail browser. The selection is being dragged to the detail viewer window to create a slide show.

Another system that supported tagging of photos with names was FotoFile, as described in a 1999 paper. Allan Kuchinsky et al, FotoFile: A Consumer Multmedia Organization and Retrieval

System, 1999. “To annotate content, the user selects one or more metadata attribute/value pairs, and presses the Annotate button. At that time, the selected attributes are applied to all selected media objects.” *Id.*, 498. The FotoFile application is shown in the following figure:

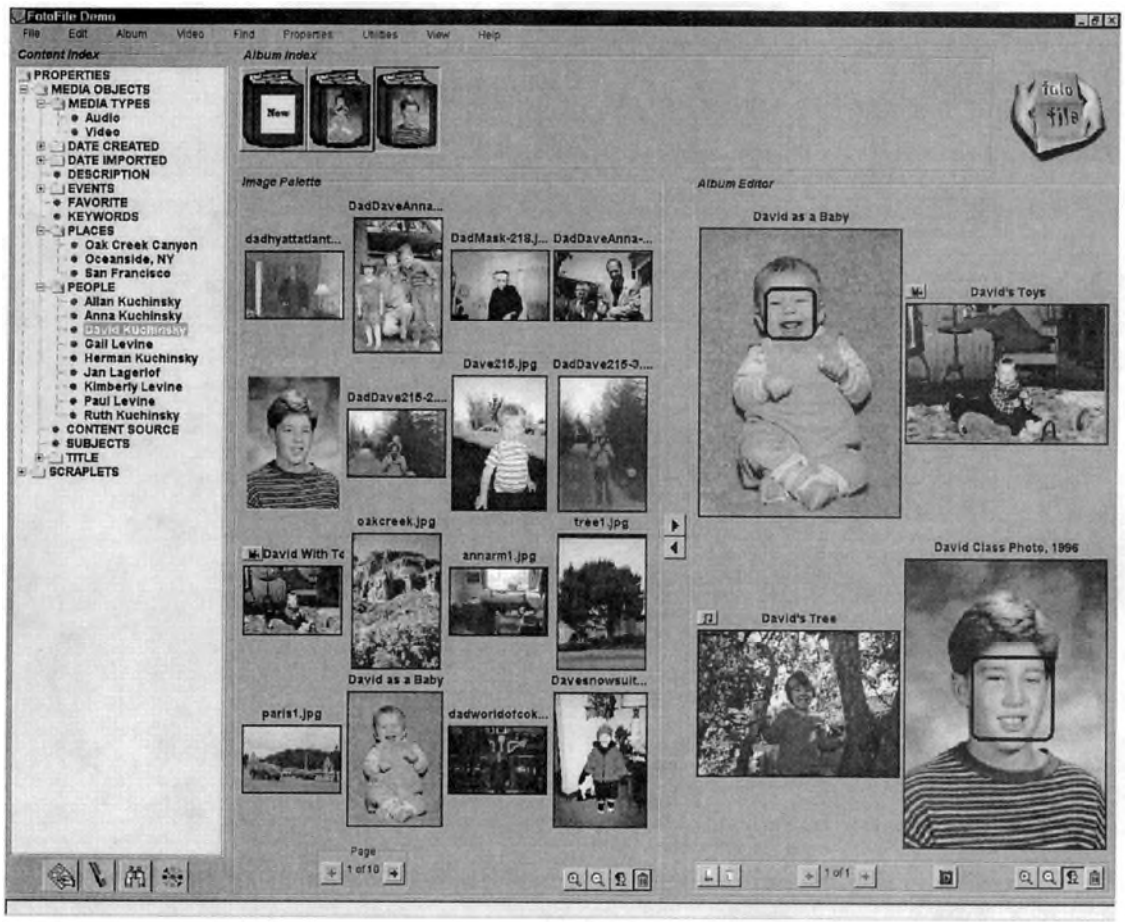


Figure 1. Building a Multimedia *Album* in *FotoFile*.

Id., 499.

Sharpe (U.S. Patent 7,461,099, filed on September 26, 2000) is yet another example of a system that allowed people to annotate photos with the names of the pictured people, and store those annotations in a database. Sharpe stores and retrieves photographs using associations between unique user identifiers and image identifiers. Users of Sharpe’s system are registered in a database by a group registration process, and those users identify themselves as a member of a particular group by logging on with a username and password. *Id.*, 5:4-6, 7:35-48. When a user

imports a new media item such as an image, the new item is assigned an "item identifier" in a database. *Id.*, 7:42-48, Fig. 5. When archiving an image, the user decides "which, if any [of] the registered people are to be associated" with that image in the database via the applicable user and image identifiers. *See id.*, 8:15-36.

Other types of well-known related information include facial recognition. Nagaoka, for example, relates "a method and an apparatus for organizing digital media, particularly digital photos, using face recognition." Abstract. Nagaoka discloses "extracting objects of interest from a plurality of photographs; cropping said plurality of photographs to generate images of isolated objects of interest; applying a recognition algorithm to determine the similarity of isolated objects of interest with a reference; displaying a plurality of objects arranged as a function of the determined similarity; and receiving user input to associate said objects with a particular classification." *Id.*

A POSITA would therefore have found it obvious to include "related information" in any of the charted '198 references and organize digital images based on the related information. A POSITA would have been motivated to do so based on a desire to create more user-friendly methods of organizing digital images. Without the capability to organize digital images by date or time or facial recognition, for example, users would be quickly overwhelmed by the sheer number of digital images to sort through to find any particular digital image. A POSITA would also have been motivated to do so as a method to provide recommendations of digital images to a user. For example, Netflix's Website for DVD rentals utilized a recommendations algorithm to recommend users digital images (box art representing DVDs to rent) since at least 2002.

(c) Control module software that selects an image to add to a playlist based on related information and retrieves and outputs a list of other digital

Maxell, Ltd.
Ex. 2015
IPR2025-01313
105 of 191

images with the same related information as candidates for the playlist for the user to select

To the extent Maxell contends that any of the charted ’198 references do not expressly disclose the limitations of claims 1 and 4, a POSITA would have understood the disclosures in each reference to inherently disclose these limitations, or at least render them obvious. The charted ’198 references each discuss that selects an image to add to a playlist based on related information and retrieves and outputs a list of other digital images with the same related information as candidates for the playlist for the user to select. Such software has been standard in any personal computer for decades. For example, a range of commercial software for managing and browsing digital photos was available as well. For example, as discussed, a range of commercial software for managing and browsing digital photos was available. For example, at least by February 1998, ACDSee had software available that allowed users to “efficiently find and organize your images.”[8] By at least July 2000, Canon offered their “ZoomBrowser EX” for Windows, which had the option of sorting digital images in chronological order.[9]

[8] https://web.archive.org/web/19980201151157/http://www.acdsee.com/acd/acdc32ft.html

[9]https://web.archive.org/web/20000711060247/http://www.powershot.com/powershot2/software/ps_pc_view.html

Maxell, Ltd.
Ex. 2015
IPR2025-01313
106 of 191

Sharpe also discloses the use of multiple databases in support of its media archival and retrieval system. For example, Sharpe's Figure 1 (annotated) discloses a database for groups of people 3, along with a separate multimedia database 8 for the storage of digital media items, including images. *Id.*, 5:4-45.

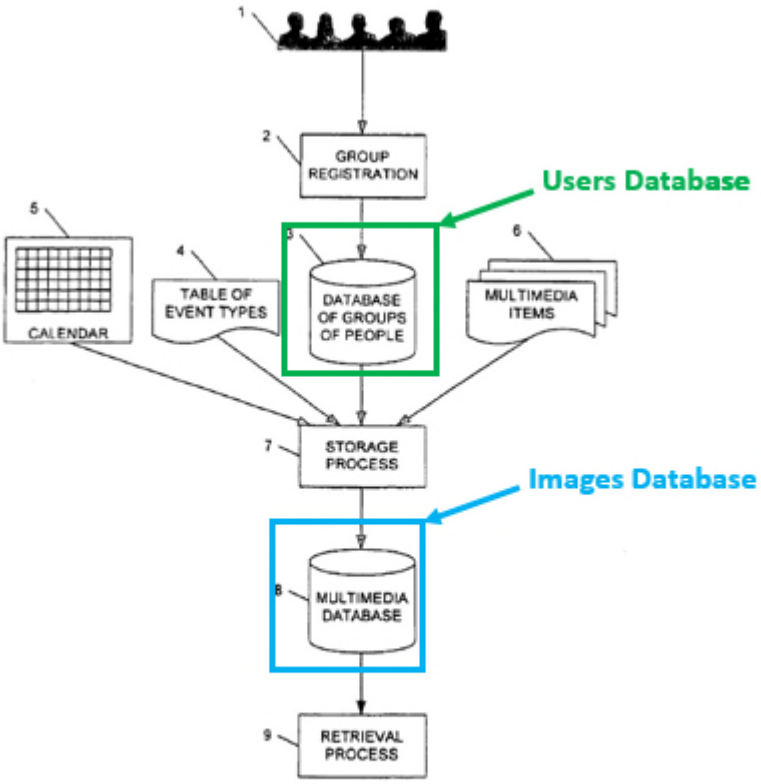


Fig 1

Id., Fig. 1 (annotated). Sharpe further provides that the multimedia database may be divided in two such that the index information for the digital media items (e.g., the people identified in an image) is stored separately from the digital media items (e.g., the image file) in a faster "index information database." *Id.*, 3:65-4:6, 4:26-28, 5:43-45.

(d) The control module outputs the playlist to a display, where the digital images, playlist, list identifying the other digital images, and the related information are output to the same display

To the extent Maxell contends that any of the charted '198 references do not expressly disclose the limitations of claims 1 and 4, a POSITA would have understood the disclosures in each reference to inherently disclose these limitations, or at least render them obvious. The charted '198 references each discuss various displays and organizations of digital images. For

example, Nagaoka discloses displaying a playlist, related information, plurality of images, and a list identifying other digital images in the same display:

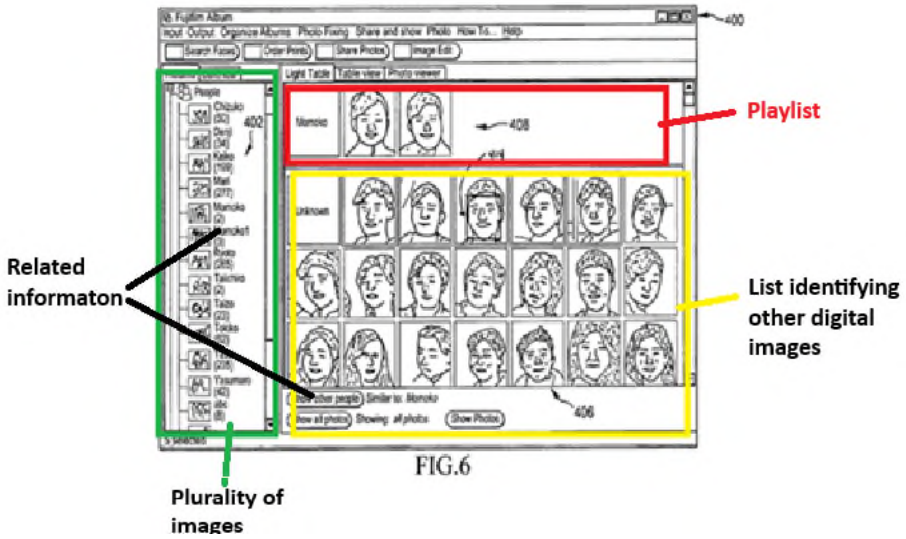


FIG.6

Nagaoka at Fig. 6. Such other digital images are also positioned next to one another. A POSITA would have found it obvious to have a display with a playlist, related information, plurality of images, and a list identifying other digital images in the same display in any of the charted ’198 references. A POSITA would have been motivated to create such an arrangement to provide a user with a viewing arrangement the provides more information to the user, making it easier to organize digital images.

(e) Reduced images displayed on display modules

To the extent Maxell contends that any of the charted ’198 references do not expressly disclose the limitations of claims 1 and 4, a POSITA would have understood the disclosures in each reference to inherently disclose these limitations, or at least render them obvious. The charted ’198 references each discuss various types of reduced images, such as providing thumbnails. Thumbnails were well known in the art as a way of providing a user with a snippet of the image, allowing the user to quickly identify the image, without taking too much space on

the display. A POSITA therefore would have found it obvious and would have been motivated to utilize reduced images on a display module for this reason. Stark further discloses using reduced image sizes. US 2006/0026636, [0051], [062].

v. ’091 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

Phillips, Wallis

A POSITA would have been motivated to combine Phillips and Wallis at least because they are analogous art to the ’091 patent as they are directed to the same field of endeavor, *i.e.*, interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. Moreover, like the ’091 patent, the object of the disclosures of Phillips and Wallis is to make user interaction with digital contents received from an outside server or VoD more convenient and as intuitive as possible. *See e.g.*, Phillips, 1:55-2:39; Wallis, ¶0010.

A POSITA would have been specifically motivated to incorporate Wallis’s metadata attribute table into Phillips’s systems to control whether an interactive operation panel or a linear operation panel is displayed to the user and, within each type of operation panel, what specific buttons to include. For example, rather than having a set operation panel that populates when a given VoD screen is displayed, or a set operation panel that populates when video or music is playing, Phillips’s system as modified by Wallis would allow for Phillips’s operation panel display to dynamically populate a set of interactive content control buttons or linear content control buttons based on the attribute data associated with the digital content.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
110 of 191

Programming Phillips's systems in this way would provide a more customized experience for the user, tailored to the particular content being displayed. Further, by associating the user interface with metadata delivered with the digital content (as in Wallis) rather than coding to a specific type of content, *e.g.*, linear or interactive (as in Phillips), the software architecture would more naturally accommodate other, future, data types. That is, there is no need to rely on a programmer to create a new/discrete operation panel with, *e.g.*, customized buttons for each new digital content screen received from an outside server. Instead, by implementing attribute data as disclosed in Wallis, the appropriate operation panel, with customized buttons based on the digital content, would be selected/populated simply by looking at the attribute values within Wallis (Figure 1 and [0056]-[0065]), which is also received from an outside server along with the digital content. Each of these benefits would have motivated one of ordinary skill in the art to modify Phillips in view of Wallis.

Wallis's attribute table could easily, and with a reasonable expectation of success, be integrated into Phillips. Deciding which operation panel (or buttons within an operation panel) to display would be a simple and predictable outcome of a condition in an "if" programming statement. Indeed, changing Phillips's existing decision-making process (based on a user-interface screen) to a condition (based on Wallis's attribute table) would be a straightforward application of well-known programming techniques, and would be well within the capabilities of a POSITA. Given the simple nature of this change—creating a condition of an "if" statement to be based on a data attribute—one of ordinary skill in the art would find the outcome predictable and obvious and is similar to how a POSITA would understand Phillips to already work in deciding which of its multiple operation panels to display.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
111 of 191

Moreover, the combination of Phillips and Wallis simply expands Phillips's functionality, as proposed above, and does not alter the fact that Phillips's control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Phillips, Wallis, Logan

A POSITA would have been motivated to combine Phillips and Wallis. Similarly, a POSITA would have been motivated to combine the teachings of Logan with that of Phillips and Wallis because all three references share the same field of interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. These same characteristics also make them analogous art to the '091 patent.

Like Phillips and Wallis, Logan also discloses "[n]avigation controls including segment lists, specially formatted screen displays, and special functions under the control of a user-operated remote control, facilitate the interactive selection and control of the presentation." Logan, Abstract; *see, e.g.*, Phillips, Abstract, 1:55-4:50, Figs. 17a, 18; Logan, Abstract, ¶¶9-10, 18-21, 30-35.

Phillips and Logan similarly disclose time-related information which represents a time during which digital contents and interactive operation buttons are displayed. For example, Phillips discloses flip tuning and browsing features, whereas Logan discloses a Mini-Nav bar. *See* Phillips, 16:22-17:32; Logan, ¶¶0087, 0093-96.

A POSITA therefore would have been motivated to add the Mini-Nav Bar feature of Logan with the flip tuning and browse features of Phillips because doing so would add another like feature very similar to those already disclosed by Phillips. Doing so would enhance the user experience by providing yet another way in which the user can interact with the digital content.

Doing so would have been a simple software modification and well within the capabilities of a POSITA.

A POSITA would have found this addition to Phillips to be a simple substitution of elements well known in the art and would have had a reasonable expectation of success in achieving the benefits disclosed in all three references by making the modification. Further, the addition of Logan's Mini-Nav bar simply expands the functionality of the Phillips-Wallis combination, and does not alter the fact that Phillips's control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Moreover, a POSITA would have been motivated to combine Logan with the Phillips-Wallis combination for at least the same reasons it would have been obvious to combine Phillips and Wallis, as described above. For example, it was well known to a POSITA that GUIs often have numerous settings that control details of the display (*e.g.*, layouts, fonts, colors, timing, and more). *See* Shneiderman, B. (2005) *Designing the User Interface: Strategies for Effective Human-Computer Interaction, Fourth Edition* ("Shneiderman"), p. 74 (Eight Golden Rules – "consistent color, layout, capitalization, fonts, and so on should be employed throughout"); *see also* p. 31 ("The Access Board spells out the implications for vision-impaired, hearing-impaired, and mobility-impaired users, such as keyboard or mouse alternatives, color coding, font-size settings, contrast settings, textual alternatives to images, and web features such as frames, links, and plug-ins."). It was also known that it could be a challenge to maintain consistency of GUIs, especially when running the same or similar program on multiple devices. Striving for consistency is the first of Ben Shneiderman's well-known "Eight Golden Rules of Interface

Design," which explains that "consistent color, layout, capitalization, fonts, and so on should be employed throughout." Shneiderman, p. 74.

A POSITA would have known that one of the simplest ways to ensure consistency of such settings is to have them configured centrally, for example, through a content or service provider. This way, if there is any reason to change them, they can be changed consistently for all users. *See* Shneiderman, p. 74.

Phillips-Wallis combinations, Uchida

As described above, a POSITA would have been motivated to combine Phillips with Wallis and Logan. Similarly, a POSITA would have been motivated to combine the teachings of Uchida with that of the Phillips-Wallis combinations because all four references share the same field of interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. These same characteristics also make them analogous art to the '091 patent.

Like Phillips, Wallis and Logan, Uchida also discloses a display 108 divided into a dedicated content display area and a dedicated control panel display area. Uchida, 21:36-22:7, 21:54-67; Figs. 10A-10C.

A POSITA therefore would have been motivated to combine Uchida with the Phillips-Wallis combinations and modify the displays such that the operation panels are always located in the same panel rendering area of the display (claim 2) and such that the rendering area size of the reproduced digital content is maintained even when at least one or the other of the operation panels is displayed.

Doing so would enhance the user experience by providing consistency in the graphic interface such that regardless of which operation panel is displayed (*e.g.*, linear or interactive) it

is displayed in the same area and the rendering area size of the digital content is maintained. Doing so would have been a simple software modification and well within the capabilities of a POSITA.

A POSITA would have found this addition to Phillips to be a straightforward substitution of elements well known in the art and would have had a reasonable expectation of success in achieving the benefits disclosed in all three references by making the modification. Further, the addition of Uchida simply enhances the user experience and does not alter the fact that Phillips's control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Moreover, a POSITA would have been motivated to combine Uchida with the Phillips-Wallis combinations for at least the same reasons it would have been obvious to combine Phillips, Wallis, and Logan, as described above. For example, it was well known to a POSITA that GUIs often have numerous settings that control details of the display (*e.g.*, layouts, fonts, colors, timing, and more). *See* Shneiderman, p. 74 (Eight Golden Rules – "consistent color, layout, capitalization, fonts, and so on should be employed throughout"); *see also* Shneiderman, p. 31 ("The Access Board spells out the implications for vision-impaired, hearing-impaired, and mobility-impaired users, such as keyboard or mouse alternatives, color coding, font-size settings, contrast settings, textual alternatives to images, and web features such as frames, links, and plug-ins."). It was also known that it could be a challenge to maintain consistency of GUIs, especially when running the same or similar program on multiple devices. Striving for consistency is the first of Ben Shneiderman's well-known "Eight Golden Rules of Interface Design," which explains that "consistent color, layout, capitalization, fonts, and so on should be employed throughout." Shneiderman, p. 74.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
115 of 191

A POSITA would have known that one of the simplest ways to ensure consistency of such settings is to have them configured centrally, for example, through a content or service provider. This way, if there is any reason to change them, they can be changed consistently for all users. *See* Shneiderman, p. 74.

Uchida's display methodology where a screen's usable space is split between a content display area and an operation panel display area was also generally known in the art. For example, in the context of portable handheld devices, U.S. Patent No. 7,667,123 to Phillips ("Phillips123") explains that a "predetermined portion of the touch-sensitive display" will contain the devices operation panel and "programmable control buttons," which may be "reprogrammed" to show different buttons depending on the content displayed. Phillips123, 6:14-32, 7:4-26, Figures 4 and 5.

As shown in the transition between Figures 4 and 5, Phillips123 explains that the Figure 4 operation panel containing "open," "new," and "edit" buttons has been reprogrammed in Figure 5 to instead include linear content controls such as fast-forward and rewind for controlling the streaming media. Phillips123, 6:14-32, 7:4-26, Figures 4 and 5.

A POSITA would have been motivated to incorporate Uchida's split display with the Phillips-Wallis combinations[10] to achieve the specific benefits described by Uchida—namely, ensuring that the displayed content is not obstructed by an operation panel displayed on the screen. In fact, Phillips even explains that rather than overlaying its operation panels on the displayed content, "the video for the current channel may be reduced in size and the flip

[10] Uchida in view of Phillips-Wallis combinations do not rely on the references' linear content operation panels or interactive content operation panels being displayed in any particular location on the screen. Moreover, nothing in the Phillips-Wallis combinations demands that the references' operation panels be displayed in any particular area and, thus, Uchida's split screen display may be incorporated into the Phillips-Wallis combinations.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
116 of 191

information ... may be displayed at a location on the periphery of the reduced-sized video (e.g., at the bottom, side, or top of the reduced-sized video)." Phillips, 16:45-50. Thus, not only is a split screen display (and the benefits thereof) expressly disclosed by Uchida, but Phillips already contemplated and disclosed the exact implementation proposed by the Uchida combination.

Moreover, utilizing Uchida's split screen display would, as a matter of graphical user interface design, provide advantages over designs with overlapping windows. Such a split screen display avoids any potential need for the user to have to reposition an overlapping window which can save time. This was shown in a 1986 paper that performed a study comparing tiled and overlapping window designs[11]: "These results confirm that tasks which require little window manipulation can be carried out more quickly using tiled windows, and that tasks which require much more window manipulation can be carried out more quickly with overlapping windows. If we look just at users who are 'inexpert' with overlapping windows, it is clear that tiled windows are better for both kinds of tasks; the advantage of overlapping windows is only available with a fair degree of practice." S.A. Bly et al., *A comparison of tiled and overlapping windows*, p. 104.

Uchida's split screen display would have easily, and with a reasonable expectation of success, been integrated into the Phillips-based grounds. Indeed, one of ordinary skill in the art would have had to simply set the position and size of Phillips's content display area and the operation panel display area based on the non-overlapping position and size taught by Uchida. Accordingly, one of ordinary skill in the art would find the combination of Uchida with the Phillips-Wallis combinations to be predictable and obvious.

[11] Uchida's split screen display is an example of a tiled window design since the windows of Uchida are adjacent and fill the screen.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
117 of 191

The proposed Uchida combination trivially modifies the location of Phillips's content display area and operation panel display area, and does not change any of the other operating principals of Phillips-Wallis combinations.

Phillips-Wallis combinations, Ellis

A POSITA would have been motivated to combine the teachings of the Philips-Wallis combination with Ellis because the references share the same field of interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. These same characteristics also make them analogous art to the '091 patent.

Indeed, Ellis and Phillips share identical portions of their respective specifications and figures. *Compare* Phillips, 6:31-20:30 *with* Ellis, ¶¶0048-129; *also compare* Phillips, Figs 2-23b with Ellis, Figs. 2-23b (identical disclosure). Within that identical disclosure, Phillips and Ellis both disclose the flip tuning and browse features discussed herein, which represent a time during which digital contents and interactive operation buttons are displayed. *See* Phillips, 16:22-17:32; Ellis, ¶¶105-114.

Ellis further discloses that "programs that are of less interest or that are particularly time-sensitive (e.g., nightly news reports) may be maintained on the network-based or local personal video recorder for less time than programs that are of more interest or are less time-sensitive (e.g., a popular situation comedy)," which facilitates efficient use of network or local storage. Ellis, ¶0012.

A POSITA would therefore have considered the flip tuning and browse features of Phillips and been motivated to modify that system to support expiration dates of programs disclosed by Ellis. Since Phillips already has the ability to keep track of how long an element has

Maxell, Ltd.
Ex. 2015
IPR2025-01313
118 of 191

been on the screen, it is clear it has the mechanism for tracking time. So, tracking time to additionally manage program expiration dates would have been something a POSITA would understand to have been a modest technical modification to Phillips. From a design perspective, a POSITA would understand that Phillips already has the concept of modifying the user experience over time to reflect various conditions – such as not covering a screen with a channel flipper that has not been used in a while. Similarly, looking to Ellis to not include shows that have not been accessed in a while would be a natural extension that is consistent with Phillips's existing design approach. Additionally, Phillips already supports an e-commerce system with the ability to buy video-on-demand programs. So, looking to Ellis to improve its e-commerce offerings by managing when programs are available would be a natural extension for a POSITA. A POSITA would have found this modification to be a simple substitution of elements well known in the art and would have had a reasonable expectation of success in achieving Ellis's benefits by making the modification.

Further, the addition of Ellis simply expands the functionality of the Phillips-Wallis combinations, and does not alter the fact that Phillips's control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Moreover, a POSITA would have been motivated to combine Ellis with the Phillips-Wallis combination for at least the same reasons it would have been obvious to combine Phillips and Wallis, as described above. For example, it was well known to a POSITA that GUIs often have numerous settings that control details of the display (*e.g.*, layouts, fonts, colors, timing, and more). *See* Shneiderman, pp. 74; *see also* Shneiderman, p. 31. It was also known that it could be a challenge to maintain consistency of GUIs, especially when running the same or similar

Maxell, Ltd.
Ex. 2015
IPR2025-01313
119 of 191

program on multiple devices. Striving for consistency is the first of Ben Shneiderman's well-known "Eight Golden Rules of Interface Design," which explains that "consistent color, layout, capitalization, fonts, and so on should be employed throughout." Shneiderman, p. 74.

A POSITA would have known that one of the simplest ways to ensure consistency of such settings is to have them configured centrally, for example, through a content or service provider. This way, if there is any reason to change them, they can be changed consistently for all users. *See* Shneiderman, p. 74. Thus, at the very least, it would have been obvious to a POSITA that the time related information disclosed in Phillips would have been received from an outside server.

Ellis '430, Wallis

A POSITA would have been motivated to combine Ellis '430 and Wallis at least because they are analogous art to the '091 patent as they are directed to the same field of endeavor, *i.e.*, interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. Moreover, like the '091 patent, the object of the disclosures of Ellis '430 and Wallis is to make user interaction with digital contents received from an outside server or VoD more convenient and as intuitive as possible.

A POSITA would have been specifically motivated to incorporate Wallis's metadata attribute table into Ellis '430's systems to control whether an interactive operation panel or a linear operation panel is displayed to the user and, within each type of operation panel, what specific buttons to include. For example, rather than having a set operation panel that populates when a given VoD screen is displayed, or a set operation panel that populates when video or music is playing, Ellis '430's system as modified by Wallis would allow for Ellis '430's

operation panel display to dynamically populate a set of interactive content control buttons or linear content control buttons based on the attribute data associated with the digital content.

Programming Ellis ’430’s systems in this way would provide a more customized experience for the user, tailored to the particular content being displayed. Further, by associating the user interface with metadata delivered with the digital content (as in Wallis) rather than coding to a specific type of content, *e.g.*, linear or interactive (as in Ellis ’430), the software architecture would more naturally accommodate other, future, data types. That is, there is no need to rely on a programmer to create a new/discrete operation panel with, *e.g.*, customized buttons for each new digital content screen received from an outside server. Instead, by implementing attribute data as disclosed in Wallis, the appropriate operation panel, with customized buttons based on the digital content, would be selected/populated simply by looking at the attribute values within Wallis’s Figure 1, which is also received from an outside server along with the digital content. Each of these benefits would have motivated one of ordinary skill in the art to modify Ellis’430 in view of Wallis.

Wallis’s attribute table could easily, and with a reasonable expectation of success, be integrated into Ellis ’430. Deciding which operation panel to display is a simple and predictable outcome of a condition in an “if” programming statement. Changing Ellis ’430’s existing decision-making process (based on a user-interface screen) to a condition (based on Wallis’s attribute table) would be a straightforward application of well-known programming techniques, and would be well within the capabilities of a POSITA. Given the simple nature of this change—creating a condition of an “if” statement to be based on a data attribute—one of ordinary skill in the art would find the outcome predictable and obvious.

Moreover, the combination of Ellis ’430 and Wallis simply expands Ellis ’430’s functionality, as proposed above, and does not alter the fact that Ellis ’430’s control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Ellis ’430, Wallis, Uchida

As described above, a POSITA would have been motivated to combine Ellis ’430 with Wallis. Similarly, a POSITA would have been motivated to combine the teachings of Uchida with that of the Ellis ’430-Wallis combination because all four references share the same field of interactive televisions systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. These same characteristics also make them analogous art to the ’091 patent.

Like Ellis ’430 and Wallis, Uchida also discloses a display 108 divided into a dedicated content display area and a dedicated control panel display area. Uchida, 21:36-22:7, 21:54-67; Figs. 10A-10C.

A POSITA therefore would have been motivated to combine Uchida with the Ellis ’430-Wallis combination and modify the displays such that the operation panels are always located in the same panel rendering area of the display (claim 2) and such that the rendering area size of the reproduced digital content is maintained even when at least one or the other of the operation panels is displayed.

Doing so would enhance the user experience by providing consistency in the graphic interface such that regardless of which operation panel is displayed (*e.g.*, linear or interactive) it is displayed in the same area and the rendering area size of the digital content is maintained.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
122 of 191

Doing so would have been a simple software modification and well within the capabilities of a POSITA.

A POSITA would have found this addition to Ellis ’430 to be a straightforward substitution of elements well known in the art and would have had a reasonable expectation of success in achieving the benefits disclosed in all three references by making the modification. Further, the addition of Uchida simply enhances the user experience and does not alter the fact that Ellis ’430’s control circuitry controls the alternative display of either of a linear content operation panel or an interactive content operation panel depending upon the presently displayed/selected screen.

Moreover, a POSITA would have been motivated to combine Uchida with the Ellis ’430-Wallis combination for at least the same reasons it would have been obvious to combine Ellis ’430 and Wallis, as described above. For example, it was well known to a POSITA that GUIs often have numerous settings that control details of the display (*e.g.*, layouts, fonts, colors, timing, and more). *See* Shneiderman, p. 74; *see also* Shneiderman, p. 31. It was also known that it could be a challenge to maintain consistency of GUIs, especially when running the same or similar program on multiple devices. Striving for consistency is the first of Ben Shneiderman’s well-known “Eight Golden Rules of Interface Design,” which explains that “consistent color, layout, capitalization, fonts, and so on should be employed throughout.” Shneiderman, p. 74.

A POSITA would have known that one of the simplest ways to ensure consistency of such settings is to have them configured centrally, for example, through a content or service provider. This way, if there is any reason to change them, they can be changed consistently for all users. *See* Shneiderman, p. 74.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
123 of 191

Uchida's display methodology where a screen's usable space is split between a content display area and an operation panel display area was also generally known in the art. For example, in the context of portable handheld devices, Phillips123 explains that a "predetermined portion of the touch-sensitive display" will contain the devices operation panel and "programmable control buttons," which may be "reprogrammed" to show different buttons depending on the content displayed. Phillips123, 6:14-32, 7:4-26, Figures 4 and 5.

As shown in the transition between Figures 4 and 5, Phillips123 explains that the Figure 4 operation panel containing "open," "new," and "edit" buttons has been reprogrammed in Figure 5 to instead include linear content controls such as fast-forward and rewind for controlling the streaming media. Phillips123, 6:14-32, 7:4-26, Figures 4 and 5.

A POSITA would have been motivated to incorporate Uchida's split display with the Ellis '430-Wallis combination[12] to achieve the specific benefits described by Uchida—namely, ensuring that the displayed content is not obstructed by an operation panel displayed on the screen. Moreover, utilizing Uchida's split screen display would, as a matter of graphical user interface design, provide advantages over designs with overlapping windows. Such a split screen display avoids any potential need for the user to have to reposition an overlapping window which can save time. This was shown in a 1986 paper that performed a study comparing tiled and overlapping window designs[13]: "These results confirm that tasks which require little window manipulation can be carried out more quickly using tiled windows, and that tasks which require

[12] Uchida in view of Ellis '430-Wallis combination does not rely on the references' linear content operation panels or interactive content operation panels being displayed in any particular location on the screen. Moreover, nothing in the Ellis '430-Wallis combination demands that the references' operation panels be displayed in any particular area and, thus, Uchida's split screen display may be incorporated into the Ellis '430-Wallis combination.

[13] Uchida's split screen display is an example of a tiled window design since the windows of Uchida are adjacent and fill the screen.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
124 of 191

much more window manipulation can be carried out more quickly with overlapping windows. If we look just at users who are 'inexpert' with overlapping windows, it is clear that tiled windows are better for both kinds of tasks; the advantage of overlapping windows is only available with a fair degree of practice." S.A. Bly et al., *A comparison of tiled and overlapping windows*, p. 104.

Uchida's split screen display would have easily, and with a reasonable expectation of success, been integrated into the Ellis '430-Wallis combination. Indeed, one of ordinary skill in the art would have had to simply set the position and size of Ellis '430's content display area and the operation panel display area based on the non-overlapping position and size taught by Uchida. Accordingly, one of ordinary skill in the art would find the combination of Uchida with the Ellis '430-Wallis combination to be predictable and obvious.

The proposed Uchida combination trivially modifies the location of Ellis '430's content display area and operation panel display area, and does not change any of the other operating principals of Ellis '430-Wallis combination.

System Art Combinations

At the time of the '091 Patent, a POSITA also would have been motivated to combine any one of the prior art systems identified herein with any, or all, of the other prior art systems identified herein. The prior art systems identified herein each relate to interactive television systems that provide enhanced user experiences through specially formatted screen displays and presentation of user controls. *See, e.g.,* Ex. 091-7 (TiVo System); Ex. 091-8 (ReplayTV System); Ex. 091-9 (FSN System); Ex. 091-10 (Comcast VoD/DVR System); Ex. 091-11 (AOL TV System); Ex. 091-12 (Microsoft Web TV System); Ex. 091-13 (RealPlayer System). Consequently, the prior art identified is generally directed towards solving the same problems identified by the '091 patent, including, *e.g.,* enhancing the user's viewing experience by

Maxell, Ltd.
Ex. 2015
IPR2025-01313
125 of 191

providing both linear and interactive control buttons to control digital content being displayed. At least for this reason, one or more combinations of the prior art systems identified herein would have been obvious.

Moreover, the prior art systems indicate an industry trend, design incentives or need, market demand or pressure, and other market forces influencing persons of ordinary skill in the art to provide methods and systems to simplify the graphical user interface presented with reproduction of digital contents. Indeed, prior to the asserted priority date of the ’091 patent, the features and functionality of the systems identified herein was often discussed together. *See, e.g.,* https://www.youtube.com/watch?v=2Fg-UDa-MAQ (exploring AOL TV and Microsoft Web TV, among other interactive television systems); Ellis ’430, ¶ [0004] (“In recent years, PVRs such as those provided by companies such as Tivo and ReplayTV have become available. Such systems and devices may be used to provide interactive television services for recording television programs….”). As such, a person of ordinary skill in the art would have been motivated to combine the systems with predictable results.

As another example, one of ordinary skill in the art would have been motivated by such considerations as efficiency, ease-of use, and convenience to combine the various teachings to arrive at the claimed invention. As another example, the claimed features are directed to mere implementation design choices that would have been obvious to a person of ordinary skill in the art to try, and within the level of ordinary skill to implement with predictable results. The foregoing are only examples of teachings, suggestions, motivations and/or reasons a person of ordinary skill in the art would have had to modify or combine the prior art noted in the system art charts. Many more teachings, suggestions, motivations and/or reasons to combine exist that would be apparent to one of ordinary skill in the art.

Samsung expects to rely on testimony of one or more percipient and expert witnesses and documents referenced by those witnesses in support of these contentions and incorporate those forthcoming expert reports as if fully set forth herein.

vi. ’645 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

Kim discloses a video processing system that performs image enhancement, for example, contrast enhancement and color enhancement. To determine whether an image from a video needs enhancement, Kim’s system determines whether a certain type of pattern-like image is contained within the image. If it detects such a pattern-like image, the image is not enhanced. If it detects there is no such pattern-like image, the image is enhanced. Kim is analogous art to the ’645 patent at least because it relates to video processing and adjusting image enhancement based on whether a video image is a pattern-like image.

Fujimura discloses a video processing system that enhances luminance contrast and chrominance contrast. The system separates an input video signal into a luminance signal Y and a chrominance signal C, and processes each independently. A letterbox signal detector determines whether black bars (*i.e.*, letterbox bars) are present in a video and limits any contrast enhancements to the picture area (excluding the letterbox bars). Fujimura is analogous art to the ’645 patent because it relates to video processing and accounting for the presence of certain patterns in the video when performing luminance correction.

DNIe discloses video processing circuitry used in, for example, TVs, that performs video contrast enhancement. The circuitry detects whether a video frame includes certain types of patterns and, if so, it bypasses enhancement of that frame. DNIe is analogous art to the ’645

Maxell, Ltd.
Ex. 2015
IPR2025-01313
127 of 191

patent at least because it relates to video processing and accounting for the presence of certain patterns in the video when performing contrast correction.

Regarding the combination of Fujimura, Kim, and/or DNIe, a POSITA would have been motivated to combine any portion of each reference with any of the other references at least because they all are analogous art to the ’645 patent, as described above. The similarity between the references, as shown in the accompanying claim charts, also would have motivated a POSITA to combine these references and would have created a reasonable expectation of success in doing so. Doing so would be a mere design choice, and adding a portion of one reference to the any of the other references would be compatible with that reference. Motivation to combine the references arises from their similar, overlapping, and/or complementary disclosures, including those set forth in the accompanying claim charts. Further motivation to do so arises out of improving a known device using a known technique to yield a predicable result. More motivation to do so arises from a desire to account for patterns in video images when performing video processing such as contrast enhancement or color enhancement, as taught by each reference.

Moreover, it would have been obvious to add to Fujimura Kim’s calculation device 34 and/or mixer 36. A POSITA could have done so by, for example, using mixer 36 to not correct the video image if calculation device 34 detects a pattern portion, as Kim discloses, except when the pattern portion is detected to be a no-picture area having a single color, as Fujimura discloses, in which case Fujimura would correct the picture area. Doing so would have been within the skill and knowledge of a POSITA, as confirmed by Kim and Fujimura. Doing so also would have led to predictable results, would have created a reasonable expectation of success, and would have been compatible with Fujimura. For example, Fujimura’s disclosed functionality

of correcting only the picture area when the video image includes black non-picture bands (letterbox bands) would be unchanged. Doing so also would have been a mere design choice, consisting of adding Kim's video processing design to Fujimura's video processing design in a straightforward manner. Motivation to do so first arises from Kim's disclosure that "pattern-like images," such as the one shown in its Figure 1, "will introduce unwanted or undesirable results," such as "unnatural and undesirable artifacts." This disclosure would have led a POSITA to add Kim's functionality described above to Fujimura to account for such pattern images. Although Fujimura discloses detecting letterbox video signals such as by decoding the video signal's "ID code," the pattern image of Kim's Figure 1 (and similar patterns) are not letterbox patterns and therefore would not be detected by Fujimura's letterbox signal detector. Thus, a POSITA would have been motivated to add Kim's functionality to Fujimura to account for such patterns for which Fujimura does not account.

Additional motivation arises from Fujimura, which discloses accounting for certain pattern portions in video when performing contrast enhancement and not performing such enhancement on the certain pattern portions. This would have encouraged a POSITA to add Kim's functionality to Fujimura to further implement this teaching by accounting for additional pattern portions in a video and not performing contrast enhancement on them, as Kim discloses.

It also would have been obvious to a POSITA to combine such functionality of Kim with DNIe for the same reasons. It also would have been obvious to a POSITA to combine the comparable functionality of DNIe with Fujimura for the same reasons.

Furthermore, it would have been obvious to combine Fujimura's detection and consideration of letterbox patterns in each of Kim and DNIe. A POSITA could have done so by, for example, incorporating the components of Fujimura cited in the accompanying claim chart as

performing such functionality into Kim and DNIe. Doing so would have been within the skill and knowledge of a POSITA. Doing so also would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with each of Kim and DNIe, and would have been a mere design choice. Motivation arises from Fujimura's disclosure of the desirability to account for letterbox bands when performing image correction.

Samsung further incorporates by reference its motivations to combine Kim and Fujimura from the '645 patent IPR (IPR2025-01312).

vii. '950 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

All of the references are analogous art and in the same field of endeavor as the '950 patent (digital imaging and camera signal processing systems). Each reference addresses the common technical problem of improving image quality by detecting and managing problematic pixels or regions that would otherwise interfere with accurate camera control functions such as autofocus, auto-exposure, white balance and other relevant camera functions. Whether dealing with high-luminance pixels (Tsujino), point light sources (Shui), overexposed regions (Iwasaki), face detection artifacts (Shi 2004), sensor-level pixel weighting (Aptina), weight-based segmentation (Yu 2004), or masking techniques (Nourani-Vatani 2007), all references recognize that certain pixels can negatively impact image processing algorithms and teach various methods for identifying, excluding, or modifying the influence of such pixels. The commercial camera references from Canon, Nikon, Olympus, and Minolta, further demonstrate that this was a well-recognized industry-wide challenge requiring systematic solutions across multiple camera manufacturers and product lines.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
130 of 191

In addition, a POSITA would have been motivated to combine, for example, the teachings of Tsujino '850, Shui '559 and/or Iwasaki '758 because Tsujino '850 discloses a signal processor with high-luminance pixel exclusion for autofocus control, Shui '559 discloses focus detection with comprehensive region-based analysis and pixel exclusion techniques, and Iwasaki '758 discloses exposure control that excludes problematic luminance groups from processing calculations. See Tsujino '850 at Figs. 1, 3, 4, 11, and 12, and cols. 6:32-41, 7:4-32, 7:42-61, 8:61-9:7, 9:32-42, 10:27-57, 11:22-55, and 12:41-58; Shui '559 at Figs. 1 and 6, and ¶¶[0007]-[0012], [0015]-[0016], [0036], [0039]-[0042], and [0050]; Iwasaki '758 at Figs. 1, 4, 5 and 14, and ¶¶[0009], [0014]-[0015], [0052]-[0058], [0064]-[0065], [0079]-[0084], and [0104]-[0106].

It was well-known in the art, as of the alleged date of the invention of the '950 patent, that comprehensive digital camera systems require coordinated feature detection and region modification across multiple processing functions including autofocus, auto-exposure, and white balance control. From this, a POSITA would have been motivated by the teachings of Shui '559 and/or Iwasaki '758, for example, to enhance Tsujino '850 pixel exclusion framework because Shui '559 provides sophisticated region-based analysis techniques and Iwasaki '758 provides comprehensive exposure control methodologies that complement Tsujino '850 autofocus-focused approach. Such a combination involves the simple application/use of well-known components (i.e., feature detection algorithms, region creation mechanisms, evaluation extraction circuits) into a comprehensive signal processing system to obtain predictable results (i.e., providing improved image quality through coordinated detection, exclusion, and processing control across multiple camera functions). A POSITA would have had a reasonable expectation of success in making the proposed combination given the complementary nature of the teachings. Such a

combination would have required minimal modifications and would have been well within the skillset of a POSITA.

A POSITA would have found it obvious, and would have been capable of modifying and been motivated to modify, the Tsujino-Shui-Iwasaki combination system, and individual elements thereof and/or actions performed by those elements, by the teachings of one or more of Shi 2004, Aptina system-on-chip and image sensors, Yu 2004, Nourani-Vatani 2007, and/or the commercial camera references from Canon, Minolta, Nikon and Olympus. Each of these references are analogous art from the same field of endeavor as the '950 patent and are reasonably pertinent to filling any gaps in the primary combination, including specific implementation details for pixel weighting, region segmentation, and processing control mechanisms.

Moreover, the Tsujino-Shui-Iwasaki combination provides the core framework for feature detection, region creation, and processing control, but may lack specific implementation details for certain claim elements. Shi 2004 provides a strong supplemental teaching for exclude/blackout background pixels for AE control based on face pixels, demonstrating sophisticated pixel exclusion methodologies. See Shi 2004 at Fig. 3 and Pages 701-703. The Aptina references provide detailed technical implementations for segmentation and excluding pixels by setting a weight equal to zero, offering specific mechanisms for pixel weighting and exclusion. See Aptina MT9V022 at Figs. 1 and 4 and Pages 1, 4 and 5; Aptina MT9D111 2005 at Figs. 31 and 35 and Pages 70, 71, and 78; Aptina MT9T111 2007 at Figs. 4 and 51 and Pages 103 and 104. Yu 2004 provides additional support for segmentation and pixel exclusion techniques through weight-based approaches. See Yu 2004 at Figs. 3.10 and 3.11 and Pages 1, 2

Maxell, Ltd.
Ex. 2015
IPR2025-01313
132 of 191

and 4. Nourani-Vatani 2007 provides complementary teachings for creating regions by removing pixels through masking techniques. See Nourani-Vatani 2007 at Figs. 2 and 5 and Pages 1-5.

The commercial camera references demonstrate that these feature detection and region modification techniques were widely implemented in consumer digital cameras with metering, segmentation, auto exposure, and auto focus algorithms. See Nikon Coolpix S51c at Pages 6, 34 and 44; Nikon Coolpix S9 at Pages 4, 24, 79 and 80; Nikon Coolpix L11/L10 at Pages 4, 21, 37 and 118; Nikon D1H at Pages 6, 14, 73, 75 and 83; Nikon Scan 4 at Pages 4, 5, 65 and 69; Canon EOS at Pages 1-8, 1-12, 1-13, 1-17, 1-18, 1-19, 2-4, 2-10 and 2-18; Olympus Camedia E-20 at Pages 9, 64, 68, 71, 72 and 83; Olympus E-500 at Pages 17, 69, 77 and 78; Olympus IR-300 at Pages 42, 47, 48; Olympus-e-330-2006 at Pages 39, 65, 73 and 74; Minolta DiMAGE Z20 at Pages 10, 42, 54-56 and 58; Minolta DiMAGE RD 3000 at Pages 10, 16, 26, 42 and 49. In other words, each reference discloses a signal processing system whereby problematic pixel features are detected, weighted/excluded from evaluation regions, and the resulting modified regions are used to control various image processing operations.

A POSITA would have been motivated to incorporate the specific implementation techniques from Shi 2004, Aptina, and/or Yu 2004 into the primary Tsujino-Shui-Iwasaki combination to address any remaining claim elements and provide robust technical implementation details. The decision to do so would have simply involved combining known prior art elements (i.e., the core detection and exclusion framework from the primary combination) according to known methods (i.e., the specific weighting, segmentation, and exclusion techniques from the supplemental references) to yield predictable results (i.e., a comprehensive signal processing system with detailed implementation mechanisms for all claimed elements). A POSITA would have understood that there would have been a reasonable

Maxell, Ltd.
Ex. 2015
IPR2025-01313
133 of 191

expectation of success in doing so, because these techniques were well-established in digital imaging systems and the commercial camera references demonstrate their widespread adoption in consumer products, providing concrete evidence that such combinations were not only feasible but actually implemented in the marketplace.

viii. ’228 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

Aminzade discloses a system that includes a smartphone and a wearable device, such as a smartwatch. Aminzade discloses that the smartphone can authenticate a user’s biometric information (*e.g.*, a fingerprint) to unlock the smartphone and the smartwatch. Aminzade is analogous art to the ’228 patent at least because it relates to authenticating a user using a static biometric sensor, unlocking a handheld device, and communicating the authentication result to another device.

Sowers discloses a wearable health monitoring device that includes various sensors to acquire health data, and that transmits the health data to a smartphone. The smartphone analyzes the data and displays the results, and further notifies the user of health risks based on the analyzed data. Sowers is analogous art to the ’228 patent at least because it relates to acquiring dynamic biometric information from a user and transmitting that information to another device, which uses that information to determine a user state and display information accordingly.

Soli discloses aggregating and sharing wellness data on a smartphone using information captured by a wearable electronic device, such as a smartwatch. The smart watch can include sensors such as a photoplethysmogram, a galvanic skin response sensor, and a temperature sensor to measure the user’s wellness data. Soli is analogous art to the ’228 patent at least

Maxell, Ltd.
Ex. 2015
IPR2025-01313
134 of 191

because it relates to acquiring dynamic biometric information from a user and transmitting that information to another device, which uses that information to determine a user state and display information accordingly.

Altman discloses a location-aware mobile device that transmits its location to a server. The device's location can be used to show that a friend is nearby or show location-based ads and coupons. Altman is analogous art to the '228 patent at least because it relates to a device automatically transmitting its position information to a server with a predetermined address.

Boettcher discloses a system in which a wearable device, such as a smartwatch, and a host device, such as a smartphone, establish a verified session in which access to sensitive information may be restricted or granted based on whether a verified session with a wearable device is in progress. Boettcher further discloses that, to enter a verified session, the wearable device must be placed in a verified state, which may be accomplished by the user providing identification credentials to the host device. Boettcher is analogous art to the '228 patent at least because it relates to authenticating a user using identification credentials and unlocking a wearable device.

Regarding the combination of Aminzade and Sowers, a POSITA could have readily added Sowers's acquisition and transmission of the dynamic biometric information from the user to Aminzade by including Sowers's sensors 103 and 107 in Aminzade's wearable device 20. A POSITA could have readily done so because Sowers's sensors already are embodied in a device "shown as a wrist band" and Aminzade's wearable device 20 may be "a smart watch" with wristband 30. A POSITA could have added Sowers's acquisition of such dynamic biometric information from its sensors to Aminzade for the same reasons, and simply by reading such data from the sensors. A POSITA also could have added Sowers's transmission of dynamic biometric

Maxell, Ltd.
Ex. 2015
IPR2025-01313
135 of 191

information to Aminzade by implementing Sowers's wireless communication circuitry (*e.g.*, component 106) in Aminzade's wearable device 20 and using it to transmit such data. A POSITA could have readily done so because Aminzade's wearable device 20 already includes wireless communication circuity (telemetry module 28 and communication unit 64). A POSITA further could have added Sowers's "continuous" acquisition of dynamic biometric information from its sensors to Aminzade by, for example, continuously "detect[ing] and stor[ing] data" from the sensors, and transmitting the data to Aminzade's smartphone when "in close enough proximity," as Sowers teaches. A POSITA could have readily done so because Aminzade's wearable device 20 already is continuously operating to determine the distance between it and mobile device 10 using wireless communication. A POSITA also could have added Sowers's display of health information, and a display of Sowers's warning or alert, to Aminzade by displaying such information on Aminzade's mobile device 10. A POSITA could have readily done so because mobile device 10 already includes a display for displaying content such as a GUI. Aminzade also discloses that its mobile device 10 includes "applications," and a POSITA could have implemented this Sowers functionality as an application, as Sowers discloses

In each case of incorporating Sowers's functionality into Aminzade, doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with Aminzade, and would have been a mere design choice. The predictability, expected success, and compatibility are further confirmed by similarities between Aminzade and Sowers. For example, both involve a smartphone that wirelessly communicates with a wrist-wearable device that includes sensors, where the smartphone uses data from the wearable device's sensors. More specifically, the devices of Sowers and Aminzade each can communicate via wireless protocols

Maxell, Ltd.
Ex. 2015
IPR2025-01313
136 of 191

like Wi-Fi and Bluetooth. And both sets of devices communicate with each other when they are "sufficiently close"/"in close proximity." Moreover, Sowers's wearable device 101 uses a general-purpose processor ("any type of device capable of processing electronic instructions …"), which matches the general-purpose processors 60 of Aminzade's wearable device. Sowers's system also "can be used with any number of different systems and is not specifically limited to the operating environment shown [in Sowers]." Furthermore, the cited Sowers functionality could be added to the existing Aminzade functionality without modifying or impacting that functionality.

Motivation to add the cited Sowers functionality to Aminzade first arises from Sowers's teaching of limiting access to a user's health data, in part for HIPAA compliance. This teaching would have led a POSITA to seek increased security for the user's health data, which is provided by the Aminzade system entering reduced access mode for both devices if the user is no longer wearing the wearable device or the wearable device is too far away from the mobile device. More motivation arises from Sowers's disclosure of the desirability to continuously monitor a user's health and provide notice of potential health problems. This would have motivated a POSITA to add the cited Sowers functionality to Aminzade, which does not disclose such functionality. Further motivation arises from Sower's disclosure that its system provides a user with "low-cost, comprehensive, continuous monitoring of his health information," which would have led a POSITA to implement it on the similar Aminzade system that does not disclose such benefit. Similar motivation arises from Sowers's disclosure of warning of "risk of heart attack," "risk of stroke," and "blood alcohol content," which a POSITA would have understood are desirable to know. Similar motivation arises from Soli, and its teaching of the desirability for users to "monitor and track their wellness data." This also would have led a POSITA to

Maxell, Ltd.
Ex. 2015
IPR2025-01313
137 of 191

implement Sower's health monitoring in Aminzade. More motivation arises from Aminzade, which does not elaborate on any specific application (*e.g.*, messaging, health monitoring) on its wearable device. This would have led a POSITA to implement such an application, where Sowers's health monitoring was a known and natural choice.

Incorporating the cited Sowers functionality in Aminzade therefore would have applied a known technique (Sowers's functionality) to known devices (Aminzade's devices) that were ready for improvement (the cited health monitoring) to yield predictable results. Doing so also would have used a known technique (the cited Sowers's functionality) to improve the similar devices of Aminzade (its smartphone and wearable device) in the same way (to provide health monitoring).

Regarding the combination of Aminzade and Soli, a POSITA could have added Soli's acquisition of the dynamic biometric information to Aminzade by including Soli's smartwatch sensors (the PPG, galvanic ski response sensor, and temperature sensor) in Aminzade's wearable device 20. A POSITA could have readily done so because these Soli sensors already are in a "smart watch" and Aminzade's wearable device 20 may be "a smart watch." A POSITA could have added Soli's acquisition of such dynamic biometric information from the sensors to Aminzade for the same reasons, and simply by reading such data from the sensors.

A POSITA also could have added Soli's transmission of dynamic biometric information to Aminzade by implementing the communication interface of Soli's smartwatch in Aminzade's wearable device 20 and using it to transmit such data. A POSITA could have readily done so because Aminzade's wearable device 20 already includes wireless communication circuity (telemetry module 28 and communication unit 64).

Maxell, Ltd.
Ex. 2015
IPR2025-01313
138 of 191

A POSITA further could have added Soli's "continuous[], intermittent[], [or] periodic[]" acquisition of dynamic biometric information from its sensors to Aminzade by, for example, "receiv[ing], [and] stor[ing] wellness … data" from the sensors with such frequency, and transmitting the data to Aminzade's smartphone wirelessly, as Soli teaches. A POSITA could have readily done so because Aminzade's wearable device 20 already is continuously operating to determine the distance between it and mobile device 10 using wireless communication.

A POSITA also could have included Soli's display of aggregated health information by displaying such information on Aminzade's mobile device 10. A POSITA could have readily done so because mobile device 10 already includes a display for displaying content such as a GUI. Aminzade also discloses that its mobile device 10 includes "applications," and a POSITA could have implemented this Soli functionality as one or more applications, as Soli discloses.

In each case of incorporating Soli's functionality into Aminzade, doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with Aminzade, and would have been a mere design choice. The predictability, expected success, and compatibility are further confirmed by similarities between Aminzade and Soli. For example, both involve a smartphone that wirelessly communicates with a wrist-wearable device that includes sensors, where the smartphone uses data from the wearable device's sensors. More specifically, the devices of Soli and Aminzade each can communicate via wireless protocols like Wi-Fi and Bluetooth. Soli's sensors 502-508 can be in "a smart watch," and Aminzade's wearable device 20 can be a "smart watch." Furthermore, the cited Soli functionality could be added to the existing Aminzade functionality without modifying or impacting that functionality.

Motivation to add the cited Soli functionality to Aminzade first arises from Soli's disclosure of the desirability for users to "monitor and track their wellness data," given that "[over 100 million] Americans currently suffer from at least one chronic condition." This would have led a POSITA to implement Soli health monitoring in Aminzade, including the Soli functionality cited above. Similar motivation arises from Sowers and its disclosure of the desirability to provide for health monitoring. Further motivation arises from Soli's disclosure of "transmitting … wellness data … to the user authorized to access the set of wellness data." This would have motivated a POSITA to transmit the dynamic biometric data from Soli's wearable device to Aminzade's mobile device 10, which authorizes the user to use the mobile device via fingerprint authentication, for example. More motivation arises from Aminzade, which does not elaborate on any specific application (*e.g.*, messaging, health monitoring) on its wearable device. This would have led a POSITA to implement such an application, where Soli's health monitoring was a known and natural choice.

Incorporating the cited Soli functionality in Aminzade therefore would have applied a known technique (Soli's cited functionality) to known devices (Aminzade's devices) that were ready for improvement (the cited health monitoring) to yield predictable results. Doing so also would have used a known technique (the cited Soli functionality) to improve the similar devices of Aminzade (its smartphone and wearable device) in the same way (to provide health monitoring).

Regarding Altman, it would have been obvious to a POSITA to combined the cited Altman functionality with Aminzade (and Aminzade combined with Sowers, and Aminzade combined with Soli). A POSITA could have done so by, for example, adding any of Altman's disclosed location detection circuitry to Aminzade's mobile device 10. A POSITA could have

Maxell, Ltd.
Ex. 2015
IPR2025-01313
140 of 191

readily done so because such modules were supported by even the 2007-era flip phones described in Altman. A POSITA also could have readily added Altman's other functionality in the form of "software instructions" to Aminzade's mobile device. Motivation to do so arises from Altman's disclosure that its location-based features "greatly enhance[] the social networking capability of [mobile] devices" and "enhance the effectiveness of ad campaigns." Doing so would have led a POSITA to implement such functionality in other mobile devices, including Aminzade's mobile device 10. Doing so therefore would have merely applied a known technique (Altman's cited functionality) to a known device (Aminzade's mobile device) that was ready for improvement (the cited location-based features) to yield predictable results.

Next, Boettcher relates to a system with a smartphone and a smartwatch where the smartphone obtains an authentication result and performs communication relating to the authentication result to the smartwatch. Boettcher therefore is analogous art to the '228 patent.

Westerman relates to a smartphone with a static biometric sensor in the form of a fingerprint sensor, that is used to authenticate the smartphone user and obtain an authentication result. Westerman therefore is analogous art to the '228 patent.

The Samsung Galaxy S5 relates to a smartphone with a static biometric sensor in the form of a fingerprint sensor, that is used to authenticate the smartphone user and obtain an authentication result. The S5 also relates to a smartphone that obtains location information denoting the location of the smartphone and automatically transmits that location information to a server with a predetermined address. The automatic transmission is based on, for example, the reception of the user's input in the form of a setting selection or opt-in selection. The S5 therefore is analogous art to the '228 patent.

Samsung Gear, including the Gear 2 smartwatch, relates to a smartwatch that communicates with a smartphone. Samsung Gear includes dynamic biometric sensors that acquire dynamic biometric information from the body of a user and transmit the dynamic biometric information to a smartwatch such as a Galaxy S5. Samsung Gear therefore is analogous art to the ’228 patent.

Huang relates to a system including a smartphone that obtains location information denoting the location of the smartphone and automatically transmits that location information to a location server with a predetermined address. The automatic transmission is based on, for example, the reception of the user’s input in the form of an opt-in selection. Huang therefore is analogous art to the ’228 patent and its dependent claims 8-9.

Regarding the combination of the Samsung Gear (including the Gear 2) and the Galaxy S5, it would have been obvious to a POSITA to combine these two references into one system. Indeed, the Gear documentation discloses doing so and the Gear products were designed to operate with smartphones such as the S5. Motivation to do so therefore arises at least from using the Gear (and S5) in its intended way, and from the documentation associated with the Gear (and S5). More motivation arises out of using the full features of the Gear and S5. For example, the Gear, the S5, and their documentation disclose using the S Health app on the S5 to view information obtained from dynamic biometric sensors on the Gear. This disclosure would have led a POSITA to use the two references in one system. Doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the Gear and S5, and would have been a mere design choice. For example, the Gear device and the accompanying

Maxell, Ltd.
Ex. 2015
IPR2025-01313
142 of 191

documentation explain how to pair the Gear with an S5 or similar smartphone using Bluetooth such that the two devices can communicate.

Likewise, it would have been obvious to a POSITA to implement the fingerprint sensor of the Galaxy S5 and its related functionality, such as obtaining an authentication result, into the smartphone disclosed by the Gear and its accompanying documentation. Motivation to do so arises from a desire to implement a fingerprint sensor in a way that would have been within the skill and knowledge of a POSITA, would have been compatible with the disclosed smartphone, would have been known, and would have created a reasonable expectation of success, and would have been a mere design choice. Motivation to do so also arises from the similarities between the two references, both of which disclosed Galaxy S5 smartphones or substantially similar smartphones.

Regarding the combination of Westerman and the Galaxy S5, it would have been obvious to a POSITA to implement the Galaxy S5 fingerprint sensor using any disclosure from Westerman regarding the implementation of its fingerprint sensor. A POSITA could have done so by, for example, incorporating Westerman's disclosure of obtaining a fingerprint authentication result into the Galaxy S5. Motivation to do so arises from a desire to implement a fingerprint sensor in a way that would have been within the skill and knowledge of a POSITA, would have been compatible with the S5, would have been known, and would have created a reasonable expectation of success, and would have been a mere design choice. Motivation to do so also arises from the similarities between the two references, both of which relate to smartphone fingerprint sensors.

Regarding the combination of Westerman and the Samsung Gear, including the Gear 2, it would have been obvious to a POSITA to incorporate the cited portions of Westerman, including

Maxell, Ltd.
Ex. 2015
IPR2025-01313
143 of 191

its fingerprint sensor and its implementation, into the smartphone disclosed by the Samsung Gear and its documentation at least for the same reasons that it would have been obvious to a POSITA to incorporate the cited portions of Westerman into the S5, set forth above. For example, a POSITA would have understood the smartphone disclosed by the Samsung Gear and its documentation to be an S5 or similar smartphone.

Regarding the combination of the Galaxy S5 and Boettcher, it would have been obvious to a POSITA to add Boettcher's functionality to the S5, including by adding Boettcher's disclosure of performing communication related to an authentication result with a smartwatch to the S5 such that the S5 performed communication related to an authentication result with a smartwatch. This includes a smartwatch such as the Samsung Gear 2. Motivation to do so arises from Boettcher's disclosures, and a desire to efficiency control access to sensitive information, as disclosed by Boettcher. Additional motivation arises from a desire to increase usability by having the smartwatch facilitate access to the host device, as Boettcher discloses. More motivation arises from a desire to eliminate the need for a user to enter a passcode or perform other authentication on the smartwatch in at least certain circumstances, as Boettcher discloses. Doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the S5, and would have been a mere design choice. It also would have been obvious to combine the other cited functionality of Boettcher with the S5 for the same reasons.

Similarly, it also would have been obvious to a POSITA add Boettcher's functionality to the smartphone of the Samsung Gear, including the Gear 2, and its documentation for the same reasons that it would have been obvious to a POSITA to add such Boettcher functionality the Galaxy S5, described above. For example, a POSITA would have understood that the

Maxell, Ltd.
Ex. 2015
IPR2025-01313
144 of 191

smartphone disclosed in the Gear documentation was an S5 or substantially similar smartphone. And, in the latter case, it would have been obvious to combine the S5 with the Gear. The contentions above regarding combining Boettcher with the S5 therefore also apply to the Samsung Gear and its disclosed smartphone.

Regarding the combination of the Galaxy S5 and Aminzade, it would have been obvious to a POSITA to add Aminzade's cited functionality to the S5, including by adding Aminzade's disclosure of performing communication related to an authentication result with a smartwatch to the S5 such that the S5 performed communication related to an authentication result with a smartwatch. This includes a smartwatch such as the Samsung Gear 2. Motivation to do so arises from Aminzade's disclosures, including a desire to increase usability but maintain sufficient security. Additional motivation arises from a desire to increase usability by having the smartwatch facilitate access to the host device, as disclosed by art such as Aminzade. More motivation arises from a desire to eliminate the need for a user to enter a passcode or perform other authentication on the smartwatch in at least certain circumstances, as disclosed by Aminzade. Doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the S5, and would have been a mere design choice. It also would have been obvious to combine the other cited functionality of Aminzade with the S5 for the same reasons.

Regarding the combination of Huang and the Galaxy S5, it would have been obvious to a POSITA to combine the cited functionality of Huang, including its position detection and related functionality, into the Galaxy S5. Motivation to do so arises from the Galaxy S5's disclosure of position-based features, which would have motivated a POSITA to implement and extend the

Maxell, Ltd.
Ex. 2015
IPR2025-01313
145 of 191

features using in a way (disclosed by Huang) that was known, within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the Galaxy S5, and would have been a mere design choice. More motivation arises from Huang and its disclosure of the benefits of position-based features and their implementation. Further motivation arises from Altman, and its disclosure of the benefits of location-based features.

Similarly, it would have been obvious to a POSITA to combine the cited features of Huang, including its position detection and related functionality, in the Samsung Gear, including its disclosure of an accompanying smartphone, for the same reasons that it would have been obvious to a POSITA to combine the cited features of Huang with the Galaxy S5, set forth above.

Regarding the combination of Altman and the Galaxy S5, it would have been obvious to a POSITA to combine the cited functionality of Altman, including its position detection and related functionality, into the Galaxy S5. Motivation to do so arises from the S5's disclosure of position-based features, which would have motivated a POSITA to implement and extend the features using in a way (disclosed by Altman) that was known, within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the Galaxy S5, and would have been a mere design choice. More motivation arises from Altman and its disclosure of the benefits of position-based features and their implementation, such as to enhance social networking. Further motivation arises from Huang, and its disclosure of the benefits of location-based features.

Similarly, it would have been obvious to a POSITA to combine the cited features of Altman, including its position detection and related functionality, in the Samsung Gear,

Maxell, Ltd.
Ex. 2015
IPR2025-01313
146 of 191

including its disclosure of an accompanying smartphone, for the same reasons that it would have been obvious to a POSITA to combine the cited features of Altman with the Galaxy S5, set forth above.

Regarding the combination of Soli and the Samsung Gear, including the Gear 2, it would have been obvious to include the cited functionality of Soli in the Samsung Gear, including the Gear 2. A POSITA could have done so by, for example, combining the Soli dynamic biometric sensor functionality, communication functionality, and related functionality to the Gear 2 smartwatch, either by adding it as new functionality or modifying the existing functionality in the Gear 2. Motivation to do so (and to add the other cited functionality of Soli to the Samsung Gear) arises from the similarity between the two references. For example, both references disclose smartwatches with dynamic biometric sensors used to detect information such as heart rate. Both references also disclose communicating the smartwatch dynamic biometric sensor information to a smartphone. Similar motivation arises Soli's disclosure of the desirability for users to monitor and track their wellness data, described above. Doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the Samsung Gear, and would have been a mere design choice.

Regarding the combination of Sowers and the Samsung Gear, including the Gear 2, it would have been obvious to include the cited functionality of Sowers in the Samsung Gear, including the Gear 2. A POSITA could have done so by, for example, combining the Sowers dynamic biometric sensor functionality, communication functionality, and related functionality to the Gear 2 smartwatch, either by adding it as new functionality or modifying the existing functionality in the Gear 2. Motivation to do so (and to add the other cited functionality of

Maxell, Ltd.
Ex. 2015
IPR2025-01313
147 of 191

Sowers to the Samsung Gear) arises from the similarity between the two references. For example, both references disclose smartwatches with dynamic biometric sensors used to detect information such as heart rate. Both references also disclose communicating the smartwatch dynamic biometric sensor information to a smartphone. Similar motivation arises Sowers's disclosure related to HIPPA compliance, described above. More motivation arises from Sower's disclosure that its system provides a user with "low-cost, comprehensive, continuous monitoring of his health information," which would have led a POSITA to implement it on the Samsung Gear to the extend not already done. Similar motivation arises from Sowers's disclosure of warning of "risk of heart attack," "risk of stroke," and "blood alcohol content," which a POSITA would have understood are desirable to know. Doing so would have been within the skill and knowledge of a POSITA, would have led to predictable results, would have created a reasonable expectation of success, would have been compatible with the Samsung Gear, and would have been a mere design choice.

ix. '646 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

(a) Background

As the '646 patent acknowledges, it was known to use a mobile device, *e.g.*, smartphone, for different applications including as a remote control to control another device (*e.g.*, TV) via a wireless local area network (LAN). '646 Patent, 1:20-35. The '646 patent also acknowledges it was known that such mobile devices are often "put into a sleep state when a predetermined time (e.g., 30 seconds) of a non-operation state passes." '646 Patent, 1:66-2:2.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
148 of 191

The ’646 patent describes a perceived problem is that when a “predetermined time has passed since the previous remote control operation, since the [mobile device] is put into the sleep state, it is necessary to … perform a lock function release operation such as the password authentication or the pattern authentication before performing a remote control operation.” ’646 Patent, 2:2-15.

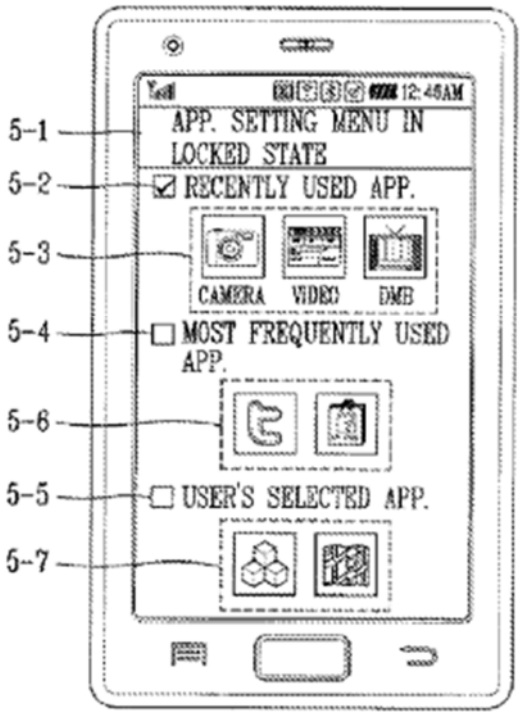
It was well known in the art that although a mobile device enters a sleep state, a user could nonetheless access certain applications, including remote control applications, from the lock screen. It was also well known that allowing such access to applications on the lock screen improved the user’s experience and provided added convenience since the user could continue using the mobile device, *e.g.*, a remote control, upon picking it up after laying it down for some time. It was also known that if the user picked up the mobile device while it is in the sleep state, the user most likely intended to use the mobile device in the same manner; *e.g.*, as a remote control.

One example is U.S. Patent Application Publication 2012/0129496 to Park, published May 24, 2012 (“Park”). EX1008. Park discloses “[a] mobile terminal including … a touch screen … a wireless communication unit configured to wirelessly communicate with at least one other terminal … and a controller configured to enter the touch screen into a locked state, to display a lock screen and an application program icon for executing an application program on the lock screen when entering the locked state.” Park, Abstract.

Referring to Fig. 5, below, Park discloses “an application program (APP) setting menu … for setting an application program to be displayed on the display unit 402 when the touch screen is in a locked state.” Park, [0083]. The setting menu includes “recently used application program(s),” “most frequently implemented application program(s),” and “user’s selected

application program(s).” Park, [0084]. “The controller 401 may also display icons indicating the application programs as well as an icon for releasing the lock on the display unit 402 when the touch screen is in the locked state.” Park, [0087]. Thus, it was known that a mobile device allows a user to access an application displayed on a locked screen and that the application is one most recently used.

FIG. 5



Park, Fig. 5.

Another example is U.S. Patent Application Publication 2014/0019994 to Miyazawa, published January 16, 2014 (“Miyazawa”). EX1009. Miyazawa discloses “the CPU 201 can initiate an application based on detection of a trigger without clearing the lock function. Consequently, when using the information processing terminal 20 to operate an external device which belongs in the same subnet, the user can omit at least a cumbersome operational procedure of selecting an application and initiating the selected application. Thus, the user can hold and

immediately use the information processing terminal as is the case with a normal remote controller." Miyazawa, [0028]. The "trigger" may be "the user's depression of a key which determines recovery … from a sleep state." Miyazawa, [0030]. Thus, upon waking up from a sleep state, a remote control application is displayed without clearing the lock function and the user can immediately use the device as a remote controller.

Miyazawa also discloses the application displayed on the lock screen may be the last application used: "the CPU 201 may preferentially select the last application used as the current application to be used and initiate the application." Miyazawa, [0035].

Lastly, Miyazawa discloses that whether the application is initiated depends on the detection of a remote device on the same network. If the remote device is not detected, the application is not be displayed, and vice versa. Referring to Fig. 5, below, Miyazawa discloses "if the … terminal 20 fails to detect a registered external device which belongs in the same subnet … the CPU 20 does not continue the process of initiating the application. On the other hand, if the … terminal 20 detects a registered external device which belongs in the same subnet, the CPU … initiat[es] the application." Miyazawa, [0024].

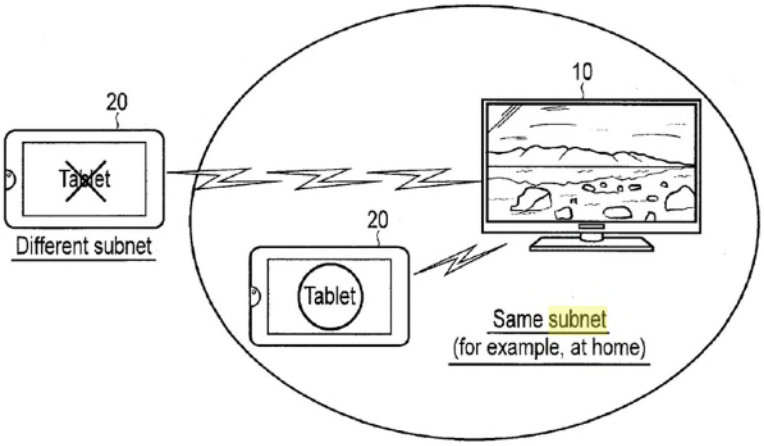


FIG. 5

Miyazawa, Fig. 5.

(b) Motivated to combine Esaka and Guihot

At the time of the ’646 Patent, a POSITA would have been motivated to combine Esaka and Guihot. As an initial matter, both references are directed to essentially the same subject matter; *e.g.*, a mobile device such as a smartphone that can be used as a remote control for another device. Esaka ’217, 2:12-30; Guihot ’251, 1:14-16. Both Esaka and Guihot also disclose that the remote control can be accessed from the smartphone’s lock screen to further improve the user’s convenience by not requiring the user to first enter a password to unlock the screen before using the device as a remote control. Esaka ’217, 4:55-61, 10:5-9, claim 1; Guihot ’251, 1:16-37, Fig. 2B. Further, both Esaka and Guihot intend to improve the user’s convenience by presenting the user with the remote control on the lock screen when it is apparent the user was using the smartphone as a remote control in particular circumstances. Esaka ’217, 10:5-9, 10:19-25; Guihot ’251, 1:28-34. For example, Esaka discloses the device should check whether it can communicate with the TV before it displays the remote icons on the lock screen. Esaka ’217, claim 1. Similarly, Guihot discloses that if the smartphone was previously used as a remote control prior to entering a sleep state the remote icons should be displayed on the lock screen. Guihot ’251, 1:16-32, 7:20-45, 10:21-30, 11:11-12:40. A POSITA would be motivated to combine Esaka’s disclosure to check whether the smartphone can communicate with the TV with Guihot’s disclosure to check whether the smartphone was previously used as a remote control prior to entering a sleep state because both scenarios are directed to the stated goal of improving user convenience and reducing user burden by enabling use of the smartphone as a remote control without requiring the user to first unlock the screen. A POSITA also would have been able to combine the disclosures of Esaka and Guihot as it would have been straight-forward and within the capabilities of a POSITA. *See, e.g.*, Esaka ’217, 2:12-30, 4:55-61, 10:5-9, 10:19-25, claim 1; Guihot ’251, 1:28-34.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
152 of 191

A POSITA would understand it follows the intention of a user to give the user quick access to the application it was using just prior to setting the device down—and therefore would be motivated to utilize Guihot's prior use verification. Guihot '251, 1:28-34, 7:20-45, 10:31-33, 10:58-12:41. Similarly, a POSITA would have understood that it follows the intention of the user to use Esaka's disclosure to verify the smartphone can communicate with the external device prior to displaying remote control icons on the lock screen. Esaka '217, claim 1. It would decrease user convenience to display remote control icons for an external device that the smartphone cannot communicate with.

Combining Esaka with Guihot would simply involve a known technique (adding a logic step to the user interface software program) to yield predictable results (a program that verifies whether the smartphone can communicate with the TV, and whether the smartphone was previously used as a remote control). A POSITA would have had a reasonable expectation of success because Esaka's user interface already has a logic step that considers whether the smartphone can communicate with the TV. Adding another logic step that determines whether the device was previously used as a remote control would be a matter of simple programming. Esaka '217, claim 1; Guihot '251, 1:16-37. A POSITA would have had a reasonable expectation that this modification would be successful because the teachings of Esaka and Guihot both make clear that these logic steps are designed to follow the intention of the user and can be predictably nested together in any software program without undue experimentation. Esaka '217, 4:55-61, 10:5-9, 10:19-25, claim 1; Guihot '251, 1:16-37. This modification also yields predictable results because it requires no change to Esaka's smartphone or TV hardware or industrial design. Esaka '217, 2:32-47, 3:19-26, 4:30-40, 4:44-55, Fig. 2, Fig. 4.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
153 of 191

If Maxell argues the portions of Esaka and Guihot cited in the claim charts relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

(c) Motivation to combine Esaka, Guihot and Bandyopadahyay

At the time of the ’646 Patent, a POSITA also would have been motivated to combine Esaka and Guihot with Bandyopadhyay. Each of those references describe a mobile device such as a conventional smartphone comprising conventional hardware and a conventional user interface. Esaka ’217, 2:32-47, 3:19-26, Fig. 2; Guihot ’251, 10:6-30; Bandyopadhyay ’247, 1:23-25, 1:55-64, 8:21-25, 8:31-37, 8:44-47, 8:54-62, 9:1-7, 10:5-35, 12:15-25, Figs. 2A, 2B, 5A. All three references are also directed toward providing a user with easier and more convenient access to certain applications while the device is in locked state. Esaka ’217, Abstract; Guihot ’251, 3:51-56; Bandyopadhyay ’247, Abstract. Although Esaka and Guihot disclose smartphones, they lack detail on conventional sensors, buttons, and user interface unlock mechanisms that were well known at the time of the purported invention. A POSITA would have looked to other references in the same field for such additional conventional features to be added to the smartphones disclosed in either Esaka or Guihot. Moreover, in light of the similarities between all three references, a POSITA would have known of all three. Bandyopadhyay discloses these conventional sensors, buttons, and user interface unlock mechanism that were well known at the time for use on smartphones. Bandyopadhyay ’247, 1:23-25, 1:55-64, 8:21-25, 8:31-37, 8:44-47, 8:54-62, 9:1-7, 10:5-35, 12:15-25, Figs. 2A, 2B, 5A. A POSITA would know that while touch screen-based virtual buttons could work well, there

were distinct advantages of using physical buttons on mobile devices. Their tactile or "haptic" feedback enables users to operate the devices "eyes-free", by touch alone. This enables users to, for example, change the volume with physical buttons without taking their eyes away from another task. This is particularly helpful for visually impaired users. Physical buttons also tend to work more reliably and accurately when wearing gloves or in specialized situations – such as when the screen is wet and may not detect finger interaction well.

In light of these known benefits, a POSITA would have been motivated to add Bandyopadhyay's conventional sensors, buttons, and user interface unlock mechanism to the smartphones disclosed in Esaka and Guihot. Moreover, a POSITA would have been capable of combining the disclosure of Bandyopadhyay with that of Esaka and/or Guihot to do so.

A POSITA would have recognized the benefit of using Bandyopadhyay's conventional sensors, buttons, and user interface unlock mechanism in Esaka and Guihot because Bandyopadhyay teaches these conventional components as part of a typical smartphone known at the time of the purported invention. Bandyopadhyay '247, 1:23-25, 1:55-64, 8:21-25, 8:31-37, 8:44-47, 8:54-62, 9:1-7, 10:5-35, 12:15-25, Figs. 2A, 2B, 5A. A POSITA would have understood, for example, that the design of Bandyopadhyay's conventional sensors, buttons, and user interface would improve user convenience because it describes a typical smartphone already known to users. The benefit of utilizing a known smartphone, familiar to users in function and user interface, would have motivated a POSITA to make this combination.

Combining the disclosure of Bandyopadhyay with that of Esaka and Guihot would simply involve adding known components (Bandyopadhyay's sensors, buttons, and user interface) to known devices of the same type (Esaka or Guihot's smartphone) but that did not disclose all such additional components to yield predictable results (a smartphone with physical

buttons, motion and location sensors, etc.) so that it can sense when it has been picked up or whether it is physically close to an external device like a TV. A POSITA would have had a reasonable expectation that the modification would be successful because, for example, the teachings of Esaka and Guihot disclose that the smartphone enters a sleep or low power state, and that it can sense when it has been picked up, but do not disclose precisely which sensors it utilizes. Esaka, Guihot, and Bandyopadhyay would be predictably combined due to the predictability of the smartphone art and the known utilization of conventional sensors, buttons, and user interface design.

If Maxell argues the portions of Esaka, Guihot, and Bandyopadhyay cited in the claim charts relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

(d) Motivation to combine Esaka, Guihot and Sharif-Ahmadi

A POSITA also would have been motivated to combine Sharif-Ahmadi with Esaka and Guihot because they each describe a similar type of mobile device, e.g., a smartphone, acting as a remote control for an external device, such as a TV. Esaka ’217, 2:12-30; Guihot ’251, 1:14-16; Sharif-Ahmadi ’343, 5:45-52. Both Esaka and Guihot disclose a smartphone, but they lack detail on the type of secure or encrypted wireless network over which the smartphone can communicate with the TV, that was well known at the time of the purported invention, therefore, a POSITA would have looked to other references in the field for details of such a device. Sharif-Ahmadi discloses these conventional encrypted wireless networks that were well known at the time. Sharif-Ahmadi ’343, 6:63-7:30, 7:34-62, 8:22-26. Further, Guihot is concerned with

network security and discloses that some applications, like email, are considered "privileged actions" that merit additional security and require "the user to perform an unlock action or series of actions before granting access to the email application." Guihot '251, 17:46-48. Similarly, Esaka is also concerned with providing operational screens that "can be securely operated." Esaka '217, 10:5-9. Therefore, a POSITA, knowing both Guihot and Esaka are concerned with security, but did not disclose well-known security features such as, e.g., encrypted wireless communications, would look to a reference that discloses other ways to secure the communications of the mobile device. A POSITA would have known of and would have been motivated to combine the security features of Sharif-Ahmadi's with the smartphones disclosed in Esaka and Guihot. A POSITA also would have been capable of combining the disclosures in Esaka, Guihot, and Sharif-Ahmadi to do so as it would have involved only simple software modifications.

A POSITA would have recognized the benefit of using Sharif-Ahmadi's secure wireless network in Esaka and Guihot because Sharif-Ahmadi teaches these secure wireless networks as part of a typical smartphone known at the time of the purported invention. Sharif-Ahmadi '343, 6:63-7:30, 7:34-62, 8:22-26. A POSITA would have understood, for example, that the design of Sharif-Ahmadi's conventional secure wireless networks would improve user convenience because it describes a typical home wireless network already known to users. The benefit of utilizing a known smartphone and home wireless network, familiar to users, would have motivated a POSITA to make this combination.

Combining Esaka and Guihot with Sharif-Ahmadi would simply involve applying known techniques (Sharif-Ahmadi's secure wireless networks) to a known device that simply did not disclose all components (Esaka's or Guihot's smartphone and home network) to yield predictable

Maxell, Ltd.
Ex. 2015
IPR2025-01313
157 of 191

results (a smartphone that communicates with a TV over a secure wireless network). A POSITA would have had a reasonable expectation that the modification would be successful because the teachings of Esaka and Guihot disclose that the smartphone communicates with a TV over a home wireless network, but do not disclose the home wireless network's encryption or security. Esaka, Guihot, and Sharif-Ahmadi would be predictably combined due to the predictability of the smartphone art and the known utilization of secure wireless networks.

If Patent Owner argues the portions of Esaka, Guihot, and Sharif-Ahmadi cited in the claim charts relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

(e) Motivation to combine iPhone 4S, HTC One, Nexus 7, Galaxy Note Pro, Galaxy S5, Galaxy S5 Sport, Galaxy 4 and/or Galaxy 3 with Son '251 and/or Yano '347

At the time of the '646 Patent, a POSITA also would have been motivated to combine any of the iPhone 4S, HTC One, Nexus 7, Galaxy Note Pro, Galaxy S5, Galaxy S5 Sport, Galaxy S4, and/or Galaxy S3 (collectively, the "'646 system art") with Son '251 and/or Yano '347. Each of the '646 system art, as well as Son '251 and Yano '347, describe or embody a mobile device such as a conventional smartphone comprising conventional hardware and a conventional user interface. Although the '646 system art discloses a smartphone or a tablet, they have varying hardware sensors to detect movement and position. The '646 system art may lack detail on conventional sensors, buttons, and user interface unlock mechanisms that were well known at the time of the purported invention. A POSITA would have looked to other references in the same field for such additional conventional features to be added to the smartphones

disclosed in the ’646 system art. Moreover, in light of the similarities between the ’646 system art and Son ’251 and Ýano ’347, a POSITA would have known of all of them. Son ’251 and Ýano ’347 disclose these conventional sensors, buttons, and a user interface unlock mechanism that were well known at the time for use on smartphones. A POSITA would know that while touch screen-based virtual buttons could work well, there were distinct advantages of using physical buttons on mobile devices. Their tactile or “haptic” feedback enables users to operate the devices “eyes-free”, by touch alone. This enables users to, for example, change the volume with physical buttons without taking their eyes away from another task. This is particularly helpful for visually impaired users. Physical buttons also tend to work more reliably and accurately when wearing gloves or in specialized situations – such as when the screen is wet and may not detect finger interaction well.

In light of these known benefits, a POSITA would have been motivated to add Son ’251 and Ýano ’347’s conventional sensors, buttons, and user interface unlock mechanism to the ’646 system art. Moreover, a POSITA would have been capable of combining the disclosure of Son ’251 and Ýano ’347 with that of the ’646 system art to do so.

A POSITA would have recognized the benefit of using Son ’251 and Ýano ’347’s conventional sensors, buttons, and user interface unlock mechanism in the ’646 system art because Son ’251 and Ýano ’347 teaches these conventional components as part of a typical smartphone known at the time of the purported invention. A POSITA would have understood, for example, that the design of Son ’251 and Ýano ’347’s conventional sensors, buttons, and user interface would improve user convenience because it describes a typical smartphone already known to users. The benefit of utilizing a known smartphone, familiar to users in function and user interface, would have motivated a POSITA to make this combination.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
159 of 191

Combining the disclosure of Son ’251 and Ýano ’347 with that of the ’646 system art would simply involve adding known components (Son ’251 and Ýano ’347’s sensors, buttons, and user interface) to known devices of the same type (the ’646 system art) but that did not disclose all such additional components to yield predictable results (a smartphone with physical buttons, motion and location sensors, etc.) so that it can sense when it has been picked up or whether it is physically close to an external device like a TV. A POSITA would have had a reasonable expectation that the modification would be successful because, for example, the teachings of the ’646 system art disclose that the smartphone enters a sleep or low power state, and that it can sense when it has been picked up, but may not disclose all of the claimed conventional sensors. The ’646 system art and Son ’251 and Ýano ’347 would be predictably combined due to the predictability of the smartphone art and the known utilization of conventional sensors, buttons, and user interface design.

If Maxell argues the portions of ’646 system art and Son ’251 and Ýano ’347 cited in the claim charts relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

(f) Motivation to combine iPhone 4S, HTC One, Nexus 7, Galaxy Note Pro, Galaxy S5, Galaxy S5 Sport, Galaxy 4 and/or Galaxy 3 with Yu ’512

A POSITA also would have been motivated to combine Yu ’512 with the ’646 system art because they each describe a similar type of mobile device, e.g., a smartphone, streaming media to an external device, such as a TV. The ’646 system art discloses a smartphone or tablet, but they lack express disclosure or detail on the type of secure or encrypted wireless network over which the smartphone can communicate with the TV, that was well known at the time of the

Maxell, Ltd.
Ex. 2015
IPR2025-01313
160 of 191

purported invention, therefore, a POSITA would have looked to other references in the field for details of such a device. Yu ’512 discloses these conventional encrypted wireless networks for streaming video that were well known at the time. A POSITA would look to a reference that discloses other ways to secure the communications of the mobile device. A POSITA would have known of and would have been motivated to combine the security features of Yu ’512 with the ’646 system art. A POSITA also would have been capable of combining the disclosures in the ’646 system art and Yu ’512 to do so as it would have involved only simple software modifications.

A POSITA would have recognized the benefit of using Yu ’512’s secure wireless network in the ’646 system art because Yu ’512 teaches these secure wireless networks as part of a typical smartphone known at the time of the purported invention. A POSITA would have understood, for example, that the design of Yu ’512’s conventional secure wireless networks would improve user convenience because it describes a typical home wireless network already known to users. The benefit of utilizing a known smartphone and home wireless network, familiar to users, would have motivated a POSITA to make this combination.

Combining the ’646 system art with Yu ’512 would simply involve applying known techniques (Yu ’512’s secure wireless networks) to a known device that simply did not disclose all components (the ’646 system art’s smartphone/tablet and home network) to yield predictable results (a smartphone or tablet that communicates with a TV over a secure wireless network). A POSITA would have had a reasonable expectation that the modification would be successful because the teachings of the ’646 system art teaches that the smartphone or tablet communicates with a TV over a home wireless network, but do not disclose the home wireless network’s

encryption or security. The ’646 system art and Yu ’512 would be predictably combined due to the predictability of the smartphone art and the known utilization of secure wireless networks.

If Maxell argues the portions of the ’646 system art and Yu ’512 cited below relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single device at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results.

x. ’681 Patent

A POSITA would have understood how to combine the teachings of the prior art references referred to in these invalidity contentions and would have been motivated to pursue such combinations for numerous reasons.

<u>Funabiki + Guo</u>

Claim [3]

Funabiki discloses that a predetermined condition is met upon completion of an authentication process between sink device 1 and source device 2. More specifically, Funabiki discloses that sink device 1 transmits an authentication completion signal at the end of the authentication process, which prompts corresponding source device 2, 3 to transmit the next EDID request signal.

It would have been obvious to a POSITA to modify Funabiki’s authentication completion signal to include a sequence number, so that source device 2 can verify the correct order of the authentication completion signal by matching the sequence number to a value stored in memory.

Funabiki may implement the High Definition Content Protection (HDCP) protocol disclosed in Guo, to provide increased security for its audio/video signals. [0119]. In HDCP, “each packet header contains a packet sequence number. Sink and source devices can use this

sequence number to get synchronized with each other." [0122]. That is, sequence numbers of Guo can be added to the packets of the authentication completion process of Funabiki. The source device 2 of Funabiki would then check the sequence number of each packet it receives from the sink device 1, to place them in the proper order. [0122]. To check the sequence number of a received packet, source device 2 must compare the sequence number to a stored value (the next number in the sequence), where a match to the stored value synchronizes the packet within the proper order of the authentication process. [0122]. That is, matching the sequence number of the authentication completion signal would confirm that the packet is the final signal of the authentication process, thus initiating a subsequent EDID request signal.

A POSITA would have been motivated to implement HDCP, and thereby modify Funabiki's authentication completion signal in the above manner, to ensure greater security for its video/audio signals. [0119].

A POSITA would have had a reasonable expectation of success in implementing this modification, as Funabiki already successfully implemented a sequence number in every one of its other signals. [0058 – 0059], Figs. 5-8. Moreover, this modification of Funabiki would involve known methods, and would have yielded predictable results.

<u>E-DDC Standard + Fastert</u>

Claim [1a]

E-DDC Standard discloses that "E-DDC and DDC/CI can be implemented on any video interface supporting E-DDC standard. Examples include the 15 pin VGA, DVI and HDMI." p. 28.

Fastert discloses content source 602 that exchanges E-DDC data wirelessly with a content sink 612: "[w]ireless media adapter 610 interfaces using DDC/E-DDC transceiver 606 with a

controller 420 contained within content generator 426 of content source 602. Wireless media adapter 610 uses wireless transceiver 512 to interface over wireless configuration and control link 506 with wireless transceiver 514 in content sink 612." Fig. 6, [0063].

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert to provide a hardware platform for carrying out the processes of the E-DDC standard using wireless communication circuitry. A POSITA would have been motivated to implement the processes of E-DDC Standard in the system of Fastert, as Fastert on its face teaches wireless communication according to the E-DDC standard. Fig. 6, [0055]-[0058], [0062], [0067], [0069], [0071], [0074], [0077].

E-DDC Standard and Fastert are analogous prior art to the '681 patent, as each relates to both video content distribution and to EDID transmission and update. Fastert [0029], [0065]; EDDC, 8, 20.

A POSITA would have had a reasonable expectation of success in combining the teachings of E-DDC Standard with the teachings of Fastert, as both references disclose transmission of requests for display capability information, and the modification to the E-DDC Standard to implement the solution taught in Fastert involves simply using the system of Fastert in its intended manner. Moreover, combining the teachings of E-DDC Standard with the teachings of Fastert would involve known methods, and would have yielded predictable results.

Claim [1b]

E-DDC Standard discloses host devices that have video interfaces (EDDC, p. 28) including video ports for output of RGB video signals (p. 29), and that transmit those video signals to a display (Id.). E-DDC Standard thus inherently discloses hosts having audio/video signal generation circuitry to generate RGB video signals for transmission to displays.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
164 of 191

Additionally, it would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, which discloses content source 402 that generates content data 424 and transmits this content data 424 to content sink 612 via a TMDS transmitter 412 and wireless transmitter 508. Fastert, Fig. 6, [0058]. See motivations to combine, claim [1a].

Claim [1c]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, which discloses that its content source 602 includes EDID/E-EDID memory cache 608: "[i]n embodiment 600, content source 602 includes a wireless media adapter 610, which includes a wireless transceiver 512, a micro-controller 604, an EDID/E-EDID cache memory (such as, but not limited to, a read/write memory, RAM, or flash memory) 608, and a DDC/E-DDC transceiver 606." Fastert, [0063]. See motivations to combine, claim [1a].

Claim [1d]

Additionally, it would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, which discloses that its content source 602 includes micro-controller 604: "In one embodiment, micro-controller 604 updates EDID/E-EDID cache memory 608 with the received EDID/E-EDID structure. In another embodiment, micro-controller 604 modifies the received EDID/E-EDID structure based on knowledge of the capabilities of content link 504. Micro-controller 604 then updates EDID/E-EDID cache memory 608 with the modified EDID/E-EDID structure. In both embodiments, after updating the EDID/E-EDID cache memory 608, micro-controller asserts a

signal to controller 420 to read EDID/E-EDID cache memory 608." Fastert, [0065]. See motivations to combine, claim [1a].

Claim [1g]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, which discloses storage of EDID in EDID/E-EDID memory cache 608: "[i]n one embodiment, micro-controller 604 updates EDID/E-EDID cache memory 608 with the received EDID/E-EDID structure. In another embodiment, micro-controller 604 modifies the received EDID/E-EDID structure based on knowledge of the capabilities of content link 504. Micro-controller 604 then updates EDID/E-EDID cache memory 608 with the modified EDID/E-EDID structure." Fastert, [0065]. See motivations to combine, claim 1[a].

Claim [1h]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, to determine format values for content sent to the sink: "[p]rior to content transfer over TMDS link 408, (source and sink) DDC/ E-DDC transceivers 430 and 432 communicate over DDC/E-DDC link 410 to exchange capabilities information, allowing the selection of the most appropriate content format for use over TMDS link 408." Fastert, [0058]. See motivations to combine, claim [1a].

Claim [1i]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of Fastert that implement the E-DDC Standard, which discloses a content source that generates content according to the display capabilities in retrieved EDID: "[u]pon receiving the transmission capabilities/quality response from content sink 114, content source

102 proceeds to determine the most appropriate content format according to the display capabilities and/or transmission capabilities learned from content sink 114, and initiates content delivery to content sink 114 in step 210." Fastert, [0040]. See motivations to combine, claim [1a].

<u>Anderson + Guo</u>

Claim [3]

Anderson may implement the High Definition Content Protection (HDCP) protocol disclosed in Guo, to provide increased security for its audio/video signals: "HDCP (High Definition Content Protection) is a protocol developed for the HDMI and DVI interface to carry protected video/audio signals. One embodiment of the present invention can be used to implement the HDCP protocol over the ASMI link 100. The employed communication schemes are based on HDCP specification. All the key vectors and key exchange schemes are the same as HDCP. The generation and application of the encryption polynomials are the same as that in the standard HDCP protocol." Guo at [0119].

In HDCP, "each packet header contains a packet sequence number. Sink and source devices can use this sequence number to get synchronized with each other." Guo at [0122]. That is, sequence numbers of Guo can be added to the client capability packet of Anderson. The host device of Anderson would then check the sequence number of each packet it receives from the sink device 1, to place them in the proper order: "For the sink side to decrypt the data correctly, the sink and source device must be in exact synchronization for all packets and all data words. Packet data format for the ASMI as described herein provides an easy way for this synchronization. In particular, each packet header contains a packet sequence number. Sink and source devices can use this sequence number to get synchronized with each other. All the key

Maxell, Ltd.
Ex. 2015
IPR2025-01313
167 of 191

exchange, key update, polynomial generation, data encryption and decryption are all synchronized with this sequence number." Guo at [0122].

To check the sequence number of a received packet, the host must compare the sequence number to a stored value (the next number in the sequence), where a match to the stored value synchronizes the packet within the proper order of the authentication process. Id. That is, matching the sequence number of the client capability packet would confirm that the packet is sent during the proper point within the restart process, thus initiating a subsequent EDID request signal.

Anderson implements HDCP, and thus already implements the HDCP process described in Guo. Anderson at [00273], [00656], [00680]. Furthermore, a POSITA would have been motivated to implement HDCP, and thereby modify Anderson's restart procedure in the above manner, to ensure that the authentication completion signal is recognized and acted upon by the correct recipient, thus providing greater security for its video/audio signals: "HDCP (High Definition Content Protection) is a protocol developed for the HDMI and DVI interface to carry protected video/audio signals. One embodiment of the present invention can be used to implement the HDCP protocol over the ASMI link 100." Guo at [0119].

A POSITA would have had a reasonable expectation of success in implementing this modification, as Anderson already discloses implementation and use of HDCP protection in its system. Anderson at [00273], [00656], [00680]. Moreover, this modification of Anderson would involve known methods, and would have yielded predictable results.

<u>Anderson + E-DDC</u>

Claim [4]

The E-DDC Standard discloses that a second EDID read request is performed after an EDID checksum match and EDID extension detection. The E-DDC Standard discloses receiving EDID information, that received EDID contains a checksum, and this checksum is used to validate the received EDID. The E-DDC Standard at 18. As retrieved EDID, including the checksum, is stored in host memory, the checksum match is necessarily a match to information stored in the memory.

The E-DDC Standard also discloses host transmission of a second EDID request message with a second number, upon detection of EDID extension blocks. For example, as previously described, after a first EDID read request (first request message) is sent with start address 00h (first number), the host checks byte 126, i.e., the EDID extension flag, of the retrieved EDID. The E-DDC Standard at 20. If this byte is not equal to zero, then an EDID extension block is detected (blue highlighting below) containing additional EDID information. *Id.* Accordingly, the host sends a second EDID read request to read the EDID extension beginning at start address 80h, where the display stores the EDID extension. *Id.*

A POSITA would thus understand the E-DDC Standard to disclose that a second EDID read request, to read data at a second start address, is performed after an EDID checksum match and EDID extension detection. A POSITA would have been motivated to implement the E-DDC Standard in the system of Anderson, to allow hosts of Anderson greater control over display capabilities and functions. *E.g.*, the E-DDC Standard at 8, 13-14, 16 (describing use of further functions listed in EDID extension blocks). Further, a POSITA would have had a reasonable expectation of success in implementing this modification, as Anderson already discloses implementation and use of information similar to base EDID. Anderson at [00374]. Moreover,

this modification of Anderson would involve known methods, and would have yielded predictable results.

Claim [5]

As above, the E-DDC Standard discloses that a second EDID read request is performed after an EDID checksum match and EDID extension detection. *See* Claim 4, above.

<u>EDDC Standard + ECMA Standard</u>

Claim [1a]

The E-DDC Standard discloses that "E-DDC and DDC/CI can be implemented on any video interface supporting E-DDC standard. Examples include the 15 pin VGA, DVI and HDMI." The E-DDC Standard at 28.

The ECMA Standard discloses an HDMI source that exchanges E-DDC data wirelessly with an HDMI sink:

"The 60 GHz wireless solution is placed between the HDMI source and HDMI sink as shown in Figure 219 and Figure 220."

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard to provide a hardware platform for carrying out the processes of the E-DDC standard using wireless communication circuitry. A POSITA would have been motivated to implement the processes of E-DDC Standard in the system of the ECMA Standard, as the ECMA Standard on its face teaches wireless communication according to the E-DDC standard. E.g., The ECMA Standard at 268, 271, Figs. 219-220.

The E-DDC Standard and the ECMA Standard are analogous prior art to the '681 patent, as each relates to both video content distribution and to EDID transmission and update. See, e.g., The ECMA Standard at 268, 271, Figs. 219-220; The E-DDC Standard at 8, 20.

A POSITA would have had a reasonable expectation of success in combining the teachings of E-DDC Standard with the teachings of the ECMA Standard, as both references disclose transmission of requests for display capability information, and the modification to the E-DDC Standard to implement the solution taught in the ECMA Standard involves simply using the system of the ECMA Standard in its intended manner. Moreover, combining the teachings of E-DDC Standard with the teachings of the ECMA Standard would involve known methods, and would have yielded predictable results.

Claim [1b]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard that implement the E-DDC Standard, which discloses HDMI source that generates audio and video content data and transmits this data to an HDMI sink via a TMDS transmitter and 60 GHz wireless transmitter. E.g., The ECMA Standard at Fig. 6, [0058]. See also motivations to combine, claim [1a].

Claim [1c]

Additionally, it would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard that implement the E-DDC Standard, which discloses that its HDMI source includes an EDID ROM. See motivations to combine, claim [1a].

Claim [1d]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard that implement the E-DDC Standard, which discloses that its HDMI source includes an HDMI transmitter. The ECMA Standard at Fig. 219. See motivations to combine, claim [1a].

Maxell, Ltd.
Ex. 2015
IPR2025-01313
171 of 191

Claim [1h]

Additionally, it would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard that implement the E-DDC Standard, to determine format values, such as color depth, for content sent to the sink:

"There are four color depths supported: 24, 30, 36, and 48 bits per pixel. The pixel encoding method is pre-negotiated as part of the E-EDID (Extended display identification data) structure." The ECMA Standard at 268. See motivations to combine, claim [1a].

Claim [1i]

It would have been obvious to a POSITA to combine the teachings of E-DDC Standard with the teachings of the ECMA Standard that implement the E-DDC Standard, which discloses a content source that generates content according to the display capabilities in retrieved EDID:

"There are four color depths supported: 24, 30, 36, and 48 bits per pixel. The pixel encoding method is pre-negotiated as part of the E-EDID (Extended display identification data) structure." The ECMA Standard at 268. See motivations to combine, claim [1a].

C. Disclosures Pursuant to P.R. 3-3(c)

The claim charts in the Exhibits identify where in each of the charted prior art references the limitations of the Asserted Claims of the Patents-in-Suit are found, and also identify the scope and content of the prior art, and differences between the prior art and the claimed invention.

Secondary considerations of non-obviousness, also referred to as objective indicia of non-obviousness, "can include copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, awards or other industry praise for the invention, and skepticism of skilled artisans before the invention." *Power*

Maxell, Ltd.
Ex. 2015
IPR2025-01313
172 of 191

Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc., 711 F.3d 1348, 1368 (Fed. Cir. 2013). "A nexus between the merits of the claimed invention and evidence of secondary considerations is required in order for the evidence to be given substantial weight in an obviousness decision." *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 668 (Fed. Cir. 2000). Moreover, even if a nexus exists, secondary considerations of non-obviousness "simply cannot overcome [a] strong prima facie showing of obviousness." *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1368 (Fed. Cir. 2008).

Plaintiff has not asserted, nor established, the existence of any objective indicia of non-obviousness or secondary considerations. Defendants reserve the right to supplement their contentions to respond to any such evidence should Plaintiff be permitted to raise them in the future. While discovery in this case is ongoing, and Defendants' investigation continues (which will include expert discovery), to the extent Plaintiff contends that one or more Asserted Claims is not obvious based on secondary considerations recognized by relevant authority, Defendants contend such allegations are without merit. For example, there is no evidence of copying of the purported inventions of the Asserted Claims. Similarly, there is no evidence of any failure of others to realize any purported inventions of the Asserted Claims, or any evidence of any long felt but unsolved need solved by the purported inventions of the Asserted Claims. To the extent Plaintiff identifies at a later time evidence of a long felt but unsolved need, any such prospective need was satisfied by others in the art, including in the references cited to and relied upon by Defendants. Further, Plaintiff has failed to show the alleged invention in-fact satisfied any such alleged long felt need.

Plaintiff also has not identified any evidence that the purported inventions of the Asserted Claims have enjoyed any commercial success. To the extent that Plaintiff claims that sales of any

Maxell, Ltd.
Ex. 2015
IPR2025-01313
173 of 191

accused products constitutes commercial success, Plaintiffs have not identified any evidence of any nexus between the claimed invention and such alleged commercial success. Moreover, any commercial success of the accused products may be due to factors other than the alleged merits of the claims, including non-patented features or functionalities, marketing efforts or other financial or economic incentives related to the sale or distribution of the accused products. There is also no evidence of unexpected results or unexpected properties in the purported inventions of the Asserted Claims. Additionally, there is no evidence of any licenses showing industry respect for the purported inventions of the Asserted Claims, and also no evidence of any awards or other industry praise for any purported inventions of the Asserted Claims. Finally, there is no evidence of any skepticism of skilled artisans prior to purported inventions of the Asserted Claims. To the contrary, the prior art identified herein establishes not only a lack of skepticism but an appreciation that the purported inventions of the Asserted Claims were known to those of skill in the art.

The charts in the Exhibits are provided based on Maxell's apparent claim construction of these limitations as disclosed in its Infringement Contentions. Defendants do not take any particular claim construction position on any of these limitations at this time and reserve the right to argue for specific claim constructions that are the same or are different at the appropriate time.

Defendants have endeavored to cite to the most relevant portions of the identified prior art. However, other portions of the identified prior art may additionally disclose, either expressly or inherently, one or more elements or limitations of the Asserted Claims. In an effort to focus the issues, Defendants identify only exemplary portions of the identified prior art. To the extent it is found a charted reference does not expressly disclose certain claim limitations, Defendants contend that such limitations are inherent. Defendants reserve the right to rely on uncited

Maxell, Ltd.
Ex. 2015
IPR2025-01313
174 of 191

portions of the identified prior art to establish the invalidity of the Asserted Claims. Moreover, Defendants reserve the right to rely on uncited portions of the identified prior art, rely on other references (irrespective of whether such references themselves qualify as prior art) to show the state of the art, and/or to rely on expert testimony to provide context to, or aid in, understanding the cited portions of the identified prior art.

Where Defendants cite to a particular drawing or figure in the attached claim charts, the citation encompasses the description of the drawing or figure, as well as any text associated with the drawing or figure. Similarly, where Defendants cite to particular text concerning a drawing or figure, the citation encompasses that drawing or figure as well.

Relatedly, it is often the case that certain portions of patent disclosures build upon other disclosures—even if they are referred to as a separate or alternative embodiment. Thus, Defendants' citations to structures or functions incorporate by references all disclosures to related structures or functions, including any additional detail provided as to the operation or design of those structures or functions. Further, citations in each dependent claim include citations to each claim from which it directly or indirectly depends. And citations as to any recited limitation, step, or component in the claims apply wherever each such limitation, step, or component is repeatedly recited elsewhere in the claim.

D. Disclosures Pursuant to P.R. 3-3(d)

Pursuant to Patent Local Rule 3-3(d), Defendants hereby identify grounds of invalidity based on lack of written description and enablement under 35 U.S.C. § 112, first paragraph (pre-AIA Patents-In-Suit) and/or 35 U.S.C. § 112(a) (AIA Patents-In-Suit). These contentions shall not be construed as an admission that any claim construction advanced by Defendants in this case is in any way inconsistent, flawed or erroneous. Nor should these contentions prevent Defendants from advancing claim construction and/or noninfringement positions in lieu of, or in

Maxell, Ltd.
Ex. 2015
IPR2025-01313
175 of 191

addition to, invalidity positions. Further, these contentions shall not be construed as an admission of or acquiescence to Maxell's purported construction of the claim language or of other positions advanced by Maxell during the course of this litigation. Indeed, Defendants' invalidity contentions under 35 U.S.C. § 112 may depend on the Court's claim construction, as well as Maxell's asserted claim scope.

Defendants currently identify the issues under 35 U.S.C. § 112 of which they are presently aware. Pursuant to the applicable provisions of the Docket Control Order and Local Rules, Defendants reserve the right to supplement or amend their contentions after the Court's *Markman* ruling or if Maxell amends or alters its infringement contentions in any way.

1. Written Description and Enablement Under 35 U.S.C. § 112(1) (pre-AIA Patents-In-Suit) and/or 35 U.S.C. § 112(a) (AIA Patents-In-Suit)

To satisfy the written description requirement of 35 U.S.C. § 112, first paragraph (pre-AIA Patents-In-Suit) and/or 35 U.S.C. § 112(a) (AIA Patents-In-Suit), the specification of a patent must "clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed" and "had possession of the claimed subject matter as of the filing date." *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). In particular, an adequate written description must "demonstrate that the patentee possessed the full scope of the invention recited in [the] claim." *LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005). To satisfy the enablement requirement, "the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation." *Genentech, Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997) (quotations omitted).

At least the following claim terms lack written description support and/or are not enabled by the specification:

Maxell, Ltd.
Ex. 2015
IPR2025-01313
176 of 191

a. ’088 Patent

’088 Patent			
No.	**Term**	**Claims**	**Reason**
1	“a command to remotely control a display operation on the communication device connected with the first communication terminal” / “a command to remotely control a display operation on the communication device connected with the communication terminal”	1, 14	Lack of enablement and written description
2	“while the communication device outputs data received from the second communication terminal that has established the connection with the communication device and upon receiving, by the communication device, the command from the first communication terminal, the communication device is configured to control how to display the data received from the second communication terminal while maintaining the connection with the second communication terminal”	1	Lack of enablement and written description
3	“while the communication device outputs data received from the another communication terminal that has established the connection with the communication device, the controller is configured to transmit the command to control how to display the data while the communication device and the another communication terminal are connected”	14	Lack of enablement and written description

b. ’650 Patent

’650 Patent			
No.	**Term**	**Claims**	**Reason**
1	“association information”	1, 4	Lack of enablement and written description
2	“content information”	1, 4	Lack of enablement and written description
3	“content(s)”	1, 4	Lack of enablement and written description
4	“device specific ID information”	1, 4	Lack of enablement and written description

’650 Patent			
5	“controller”	1, 4	Lack of enablement and written description
6	“wherein the main terminal comprises: a storage storing the contents”	1, 4	Lack of enablement and written description
7	“terminal”/“terminals”	1, 4	Lack of enablement and written description
8	“a first display displaying the contents”	1, 4	Lack of enablement and written description
9	“a second display displaying the content”	1, 4	Lack of enablement and written description
10	“wherein, the main terminal determines whether it is possible to connect to the subsidiary terminal storing the device specific ID information”	1	Lack of enablement and written description
11	“wherein the first controller is configured to: store a plurality of device specific identification (ID) information of the subsidiary terminals, store a plurality of content information for identifying each of the contents, and store association information for transmitting one of the contents to one of the subsidiary terminals”	1	Lack of enablement and written description
12	“a second controller controlling transmission/reception with the main terminal, the second controller storing device specific ID information for identifying the subsidiary terminal and transmitting the device specific ID information to the main terminal when connecting to the main terminal”	1	Lack of enablement and written description
13	“a first controller controlling transmission/reception with the first subsidiary terminal and the second subsidiary terminal”	4	Lack of enablement and written description
14	“a second controller controlling transmission/reception with the main terminal, the second controller storing the first device specific ID information for identifying the first subsidiary terminal and transmitting the first device specific ID information to the main terminal when connecting to the main terminal”	4	Lack of enablement and written description
15	“a third controller controlling transmission/reception with the main terminal, the third controller storing the	4	Lack of enablement and written description

’650 Patent			
	second device specific ID information for identifying the second subsidiary terminal and transmitting the second device specific ID information to the main terminal when connecting to the main terminal”		
16	“a third display displaying the content”	4	Lack of enablement and written description

c. ’417 Patent

’417 Patent			
No.	**Term**	**Claims**	**Reason**
1	“wherein the specific processing is a processing having an effect on a response to a request from the user”	2	Lack of enablement and written description

d. ’198 Patent

’198 Patent			
No.	**Term**	**Claims**	**Reason**
1	“an output module”	1	Lack of written description
2	“a control module”	1	Lack of written description
3	“other digital images whose related information is the same as the selected digital image”	1	Lack of written description
4	“a control module which selects a digital image to add in a playlist, based on one of the plurality of information”	1	Lack of written description
5	“the plurality of information concerning the digital image”	1	Lack of written description
6	“outputs a list identifying the other digital images retrieved based on their related information”	1	Lack of written description
7	“a plurality of said digital images added”	1	Lack of written description
8	“said plurality of related information, said list identifying the other digital images, and said playlist are outputted in a same display”	1	Lack of written description
9	“retrieves other digital images whose related information is the same as the selected digital image”	1	Lack of written description
10	“outputs a list identifying the other digital images retrieved based on their related information”	1	Lack of written description

’198 Patent			
11	“a reduced image is displayed on said display module as the information showing the digital image selected by said control module.”	4	Lack of written description

e. ’091 Patent

’091 Patent			
No.	**Term**	**Claims**	**Reason**
1	“wherein the controller is configured to alternatively display either of a first operation panel including at least one of linear operation buttons, receiving user-instructions regarding linear reproduction functions of the reproduced digital contents, or a second operation panel including at least one of interactive operation buttons, receiving user-instructions of interactive functions to the outside server, together with the reproduced digital contents”	1	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
2	“time related information which represents a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed”	1	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091

’091 Patent			
			patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
3	“display at least one of the interactive operation buttons during the time represented by the time related information”	1	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
4	“other than the time represented by the time related information, display at least one of the linear operation buttons or at least one of the interactive operation buttons based on the panel related information”	1	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024)

’091 Patent			
			b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
5	“wherein the controller is configured to display at least one of linear operation buttons, receiving user-instructions regarding linear reproduction functions of the reproduced digital contents, or at least one of interactive operation buttons, receiving user-instructions of interactive functions to the video on demand server, together with the reproduced digital contents”	14	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
6	“time related information which represents a time during which the reproduced digital contents and at least one of the interactive operation buttons are displayed”	14	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc.,

’091 Patent			
			No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
7	“display at least one of the interactive operation buttons during the time represented by the time related information”	14	Lack of enablement and written description a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain
8	“other than the time represented by the time related information, display at least one of	14	Lack of enablement and written description

’091 Patent			
	the linear operation buttons or at least one of the interactive operation buttons based on the panel related information”		a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to any U.S. or foreign application in the chain of the ’091 patent for failure to support this claim limitation. Therefore, each published application and issued patent in the priority chain of the ’091 patent is prior art and renders all claims of the ’091 patent invalid as being anticipated and/or obvious in view of each such published application and issued patent in the priority chain

f. ’645 Patent

’645 Patent			
No.	**Term**	**Claims**	**Reason**
1	“a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern portions are not contained and when the pattern portions are the no-picture areas, and which controls the corrector to cause the corrector not to correct the video signal when the pattern portions are not the no-picture areas.”	5	Lack of written description

g. ’228 Patent

’228 Patent			
No.	**Term**	**Claims**	**Reason**
1	“a second communication interface that performs communication relating to the authentication result with the first	1	Lack of written description

’228 Patent			
	communication interface and receives the dynamic biometric information transmitted from the first communication interface”		
2	“[wherein the first information processing device …] performs communication relating to the authentication result between the first communication interface and the second communication interface and executes an unlock operation to unlock itself in response to the communication relating to the authentication result”	1	Lack of written description
3	“[wherein the first information processing device …] acquires the dynamic biometric information from the dynamic biometric information acquisition sensor after unlocking”	1	Lack of written description
4	“[wherein the first information processing device …] maintains the unlocked state during a condition that the dynamic biometric information can be acquired”	1	Lack of written description
5	wherein the second information processing device receives the dynamic biometric information via communication between the first communication interface and the second communication interface and the display screen displays information based on a state of the user that is determined using the received dynamic biometric information	1	Lack of written description
6	“wherein the first information processing device continuously acquires the dynamic biometric information after being unlocked and the second information processing device receives the dynamic biometric information transmitted from the first communication device continuously or based on starting of an application on the second information processing device”	7	Lack of written description
7	“wherein the second information processing device gets position information denoting a position of the second information processing device and automatically transmits the position information to a predetermined address based on reception of a user input that is determined to be a predetermined type of user input during a	8	Lack of written description

’228 Patent			
	time period, wherein the predetermined address is not inputted by the user during the time period”		
8	“wherein the position information is automatically transmitted in response to the user input and without requiring additional user input that explicitly requires approval of the automatic transmission of the position information during the time period”	9	Lack of written description

h. ’681 Patent

’681 Patent			
No.	**Term**	**Claims**	**Reason**
1	“transmit, to the display apparatus via the wireless communication circuitry, the first request message together with a first number;”	1	Lack of enablement and written description. a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to parent patent 11,611,718 for failure to support this claim limitation. Therefore, US 11,611,718 anticipates all claims.
2	when a predetermined condition is met, transmit, to the display apparatus via the wireless communication circuitry, the second request message together with a second number which is different from the first number,”	1	Lack of enablement and written description. a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to parent patent 11,611,718 for failure to support this claim limitation. Therefore, US 11,611,718 anticipates all claims.

’681 Patent			
3	“wherein one of the first number transmitted with the first request message to the display apparatus and the second number transmitted with the second request message to the display apparatus is generated by increasing the other of the first number and the second number by an arbitrary number”	1	Lack of enablement and written description. a) invalid under §112. Google LLC, v. Sonos, Inc., No. 23-1259 (Fed. Cir. 2024) b) Lack of priority to parent patent 11,611,718 for failure to support this claim limitation. Therefore, US 11,611,718 anticipates all claims.
4	“wherein the predetermined condition is met when identification information for wireless communication received from the display apparatus matches identification information stored in the memory”	3	Lack of enablement and written description
5	“wherein the predetermined condition is met when specific information included in EDID (Extended Display Identification Data) received from the display apparatus matches specific information stored in the memory”	4	Lack of enablement and written description
6	“wherein the specific information included in the EDID is either a checksum value, a CRC (Cyclic Redundancy Check) value, or a hash value of the EDID”	5	Lack of enablement and written description
7	“wherein the control circuitry is further configured to store a third number in the memory, the third number being different from the first number, the third number being received from the display apparatus via the wireless communication circuitry”	7	Lack of enablement and written description

All claims reciting these terms are neither supported by the specification nor enabled to their full scope. Accordingly, they are invalid under section 112, first paragraph (pre-AIA Patents-In-Suit) and/or 35 U.S.C. § 112(a) (AIA Patents-In-Suit).

III. DISCLOSURES PURSUANT TO P.R. 3-4

Defendants are concurrently producing, or otherwise making available for inspection, non-privileged documents, including source code, that satisfy the requirements of Patent Local Rules 3-4(a) and (b).

Defendants can also make available for inspection certain systems relied upon herein and referenced in the attached claim charts.

Defendants reserve the right to supplement its production as Defendants obtain additional prior art references, documentation, products or corroborating evidence concerning invalidity during the course of discovery.

Dated: October 28, 2025

Respectfully submitted,

By */s/ Erik Fuehrer*

Melissa R. Smith
State Bar No. 24001351
GILLAM & SMITH, LLP
303 South Washington Avenue
Marshall, Texas 75670
Telephone: (903) 934-8450
Facsimile: (903) 934-9257
Email: melissa@gillamsmithlaw.com

Sean Cunningham *(Pro Hac Vice)*
Erin Gibson *(Pro Hac Vice)*
Salvatore Tamburo *(Pro Hac Vice)*
DLA PIPER LLP (US)
500 Eighth Street, NW
Washington, DC 200004
Telephone: (202) 799-4000
Facsimile: (202) 799-5000
sean.cunningham@us.dlapiper.com
erin.gibson@us.dlapiper.com
salvatore.tamburo@us.dlapiper.com

Mark Fowler *(Pro Hac Vice)*
Alan Limbach *(Pro Hac Vice)*
Erik Fuehrer

Maxell, Ltd.
Ex. 2015
IPR2025-01313
188 of 191

DLA PIPER LLP (US)
3203 Hanover Street, Suite 100
Palo Alto, CA 94304
Telephone: (650) 833-2000
Facsimile: (650) 833-2001
mark.fowler@us.dlapiper.com
alan.limbach@us.dlapiper.com
erik.fuehrer@us.dlapiper.com

Michael Jay *(Pro Hac Vice)*
DLA PIPER LLP (US)
2000 Avenue of the Stars
Suite 400 North Tower
Los Angeles, CA 90067
Telephone: (310) 595-3000
Facsimile: (310) 595-3300
michael.jay@us.dlapiper.com

James Heintz *(Pro Hac Vice)*
DLA PIPER LLP (US)
One Fountain Square
11911 Freedom Drive, Suite 300
Reston, VA 20190-5602
Telephone: (703) 773-4000
Facsimile: (703) 773-5000
jim.heintz@us.dlapiper.com

Robert Buergi
DLA PIPER LLP (US)
845 Texas Avenue, Suite 3800
Houston, TX 77002-2946
Telephone: (713) 425-8449
Facsimile: (713) 425-8401
robert.buergi@us.dlapiper

Paulina M. Starostka *(Pro Hac Vice)*
DLA PIPER LLP (US)
444 West Lake Street, Suite 900
Chicago, IL 60606-0089
Telephone: (312) 368-4000
Facsimile: (312) 236-7516
paulina.starostka@us.dlapiper.com

Angela Whitesell *(Pro Hac Vice)*
DLA PIPER LLP (US)
1201 North Market Street, Suite 2100

Maxell, Ltd.
Ex. 2015
IPR2025-01313
189 of 191

Wilmington, DE 19801
Telephone: (302) 468-5700
Facsimile: (302) 394-2341
angela.whitesell@us.dlapiper.com

ATTORNEYS FOR DEFENDANTS
SAMSUNG ELECTRONICS CO., LTD. and
SAMSUNG ELECTRONICS AMERICA, INC.

Maxell, Ltd.
Ex. 2015
IPR2025-01313
190 of 191

CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record who are deemed to have consented to electronic service are being served with a copy of this document via electronic mail on October 28, 2025.

/s/ Erik Fuehrer
Erik Fuehrer