EXHIBIT I: OBVIOUSNESS COMBINATIONS

CardWare Inc. v. Google LLC, Case No. 7:24-cv-00278 (W.D. Tex.)

Exemplary obviousness combinations and motivations to combine the prior art are set forth below. The references discussed in the corresponding invalidity claim charts show examples of how the prior art cited discloses the elements of the Asserted Claims explicitly, inherently, and/or in combination, or would have rendered them obvious to a POSITA, as set forth in the exemplary combinations below and as described in the cover pleading. These charts serves as notice that Google may contend that any claim identified below is inherently disclosed by or rendered obvious by the reference(s) cited as a whole, the knowledge and understanding of a POSITA, in view of the state of the art as evidenced by any background references on which Google or its expert(s) may rely, market conditions, user feedback, consumer concerns or interests, common knowledge in the relevant industry, standard industry practices, common sense, obvious user-interface implementations or modifications that need no supporting disclosure, or any other reason—including for claims or claim elements for which the invalidity claim charts do not include any disclosure from the references cited.

<u>'520 Patent</u>

'520 Patent																							
No.	**Prior Art Combination**	**Asserted Claims Rendered Obvious**																					
		1	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**
1.	Gomez & Carlson	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**			**X**	**X**	
2.	Gomez & Carlson & Deibert	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
3.	Gomez & Carlson & Mullen-915	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
4.	Gomez & Carlson & Mullen-915 & Deibert	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
5.	Gomez & Carlson & Jones	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’520 Patent																							
No.	Prior Art Combination	Asserted Claims Rendered Obvious																					
		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
6.	Gomez & Carlson & Jones & Deibert	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Google Wallet[1] & Gomez & Carlson & Jones & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.	Gomez & Carlson & Jones & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Gomez & Carlson & Jones & Mullen-701	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Gomez & Carlson & Jones & Yoo	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Gill & Smith & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.	Gill & Smith & Kay & Gomez	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Gill & Gomez & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Gill & Smith & Kay & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Gill & Smith & Kay & Gomez & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Gill & Gomez & Kay & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Gomez & Smith	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
18.	Gomez & Smith & Deibert	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Google Wallet & Gomez & Smith & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Gomez & Smith & Mullen-915	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Gomez & Smith & Cox	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22.	Gomez & Smith & Jones	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Gomez & Smith & Jones & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Gomez & Smith & Jones & Mullen-701	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Gomez & Carlson & Shoemaker	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Gomez & Carlson & Shoemaker & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Gomez & Carlson & Shoemaker & Mullen-701	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.	Gomez & Carlson & Shoemaker & Yoo	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’520 Patent																							
No.	Prior Art Combination	Asserted Claims Rendered Obvious																					
		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
29.	Carlson & Royyuru-035	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Carlson & Royyuru-035 & Mullen-915	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.	Carlson & Royyuru-035 & Cox	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Carlson & Royyuru-035 & Jones	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Carlson & Royyuru-035 & Jones & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Carlson & Royyuru-035 & Jones & Mullen-701	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Shoemaker & Dixon & Spitzer	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.	Shoemaker & Dixon & Spitzer & Deibert	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Shoemaker & Dixon & Spitzer & Boalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Shoemaker & Dixon & Spitzer & Gomez	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Shoemaker & Dixon & Spitzer & Gill	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Shoemaker & Dixon & Spitzer & Assora	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Royyuru-545 & Kay & Gill	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Google Wallet & Royyuru-545 & Kay & Gill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Royyuru-545 & Spitzer & Gill	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Royyuru-545 & Spitzer & Gill & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Royyuru-545 & Spitzer & Gill & Smith	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Google Wallet[2][3] Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[2] References to “Google Wallet” herein refer to the system discussed in the Google Wallet invalidity claim charts (Exhibits A-06, B-06, C-06, D-06 and E-06), including all supporting references, publications, standards, devices, and systems identified, and are subject to revision and supplementation as discovery proceeds.

[3] The Google Wallet invalidity charts for each patent provide further detail regarding the combinations and motivations to combine.

EXHIBIT I: OBVIOUSNESS COMBINATIONS

'520 Patent																							
No.	Prior Art Combination	Asserted Claims Rendered Obvious																					
		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Magento/PayPal, LoopPay Tokenization[4]																						
47.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Google Wallet Combined with Known Systems and Publications for Contactless ATM Transaction, including Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Google Wallet Combined with Known Credit Card CVV and CVC and Expiration Date Techniques	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Law-540 & Carlson	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
51.	Law-540 & Carlson & Jones	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Law-540 & Carlson & Giordano	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
53.	Law-540 & Carlson & Deibert	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.	Law-540 & Carlson & Jones	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Google Wallet & Law-540 & Carlson & Jones & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Law-540 & Smith & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Law-540 & Gomez & Kay	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Law-540 & Smith	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	
59.	Law-540 & Smith & Cox	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Law-540 & Smith & Jones	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Law-540 & Royyuru-035	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Law-540 & Royyuru-035 & Mullen-915	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Law-540 & Dixon & Spitzer	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Law-540 & Kay & Gill	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

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		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
65.	Law-540 & Spitzer & Gill & Smith	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Gomez & Carlson & Mullen-915 & Law-540	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Gill & Smith & Kay & Gomez & Law-540	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Gomez & Smith & Deibert & Law-540	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
69.	Carlson & Royyuru-035 & Law-540	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Royyuru-545 & Spitzer & Gill & Law-540	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Gomez & Carlson & Giordano	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X				X		
72.	Gill & Gomez & Kay & Giordano	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
73.	Royyuru-545 & Kay & Gill & Giordano	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Gomez & Smith & Spodak	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X				X		
75.	Carlson & Royyuru-035 & Cox & Spodak	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Gomez & Carlson & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Gomez & Carlson & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Gomez & Carlson & Giordano & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Gomez & Carlson & Giordano & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Law-540 & Carlson & Nasiri & Rigatti & Jones	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
81.	Law-540 & Carlson & Marvit & Rigatti & Jones	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
82.	Law-540 & Gomez & Jones & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83.	Law-540 & Gomez & Jones & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
84.	Law-540 & Gomez & Jones & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
85.	Law-540 & Gomez & Jones & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Law-540 & Gomez & Jones & Marvit & Rigatti & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87.	Law-540 & Carlson & Giordano & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Law-540 & Carlson & Giordano & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
89.	Gomez & Carlson & Deibert & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Gomez & Carlson & Deibert & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Law-540 & Carlson & Deibert & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Law-540 & Carlson & Deibert & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Gill & Gomez & Kay & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Gill & Gomez & Kay & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Gill & Gomez & Kay & Giordano & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Gill & Gomez & Kay & Giordano & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
97.	Law-540 & Gomez & Kay & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
98.	Law-540 & Gomez & Kay & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
99.	Law-540 & Gomez & Kay & Giordano & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100.	Law-540 & Gomez & Kay & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	& Marvit & Rigatti																						
101.	Gill & Smith & Kay & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102.	Gill & Smith & Kay & Gomez & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
103.	Google Wallet & Gomez & Smith & Mullen-915 & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
104.	Google Wallet & Gomez & Smith & Mullen-915 & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
105.	Gomez & Smith & Cox & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
106.	Gomez & Smith & Cox & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
107.	Law-540 & Smith & Cox & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108.	Law-540 & Smith & Cox & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
109.	Gomez & Smith & Jones & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
110.	Gomez & Smith & Jones & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
111.	Law-540 & Smith & Jones & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
112.	Law-540 & Smith & Jones & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
113.	Carlson & Royyuru-035 & Cox & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
114.	Carlson & Royyuru-035 & Cox & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
115.	Carlson & Royyuru-035 & Cox & Spodak & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’520 Patent																							
No.	Prior Art Combination	Asserted Claims Rendered Obvious																					
		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
116.	Carlson & Royyuru-035 & Cox & Spodak & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
117.	Shoemaker & Dixon & Spitzer & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
118.	Shoemaker & Dixon & Spitzer & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
119.	Law-540 & Dixon & Spitzer & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
120.	Law-540 & Dixon & Spitzer & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
121.	Law-540 & Smith & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
122.	Law-540 & Smith & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
123.	Law-540 & Kay & Gill & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
124.	Law-540 & Kay & Gill & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
125.	Gomez & Smith & Spodak & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
126.	Gomez & Smith & Spodak & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
127.	Google Wallet & Gomez & Law-540 & Jones	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
128.	Google Wallet & Law-540 & Nasiri & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
129.	Google Wallet & Law-540 & Marvit & Rigatti	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
130.	Law-540 & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
131.	Law-540 & Gomez & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
132.	Google Wallet & Gomez & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
133.	Google Wallet & Law-540 & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’520 Patent																							
No.	Prior Art Combination	Asserted Claims Rendered Obvious																					
		1	2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
134.	Google Wallet & Law-540 & Gomez & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
135.	Google Wallet & Gill & Smith & Kay & Mjolsnes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
136.	Google Wallet & Gill & Smith & Kay & Gomez & Mjolsnes	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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’579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1.	Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.	Royyuru-545 & Phillips & Casey & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.	Royyuru-545 & Phillips & Casey & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.	Royyuru-545 & Phillips & Casey & Mistry & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.	Royyuru-545 & Phillips & Giordano & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Royyuru-545 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.	Royyuru-545 & Phillips & Casey & Mistry & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Royyuru-545 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Royyuru-545 & Phillips & Giordano & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Google Wallet & Royyuru-545 & Phillips	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’579 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	& Casey																								
12.	Google Wallet & Royyuru-545 & Phillips & Casey & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Royyuru-545 & Phillips & Casey & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Royyuru-545 & Phillips & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Royyuru-545 & Phillips & Giordano & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Royyuru-545 & Phillips & Giordano & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Royyuru-545 & Phillips & Casey & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.	Gomez & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Gomez & Amacker & Mullen-915 & Smith & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Google Wallet & Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22.	Gomez & Amacker & Mullen-915 & Smith & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Gomez & Amacker & Mullen-915 & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Gomez & Amacker & Mullen-915 & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Gomez & Giordano & Mullen & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Gomez & Giordano & Mullen & Smith & Diebert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Royyuru-545 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.	Royyuru-545 & Phillips & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29.	Royyuru-545 & Gomez & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Royyuru-545 & Phillips & Casey &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

'579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Hathaway																							
31.	Royyuru-545 & Phillips & Casey & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Royyuru-545 & Phillips & Casey & Qasim	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Royyuru-545 & Phillips & Casey & Amacker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Gomez & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.	Gomez & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Gomez & Amacker & Mullen-915 & Cox & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Smith & Deibert & Amacker &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Smith & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Smith & Kay & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Smith & Kay & Cox & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Smith & Kay & Cox & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Smith & Kay & Cox & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Smith & Kay & Cox & Mistry & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Smith & Kay & Cox & Purdy & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47.	Google Wallet & Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Smith & Cox & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Smith & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Smith & Kay & Royyuru-545 & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
51.	Smith & Kay & Royyuru-545 & Deibert & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Smith & Kay & Royyuru-545 & Deibert & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
53.	Smith & Kay & Royyuru-545 & Deibert &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Civelli & Purdy																							
54.	Smith & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Smith & Kay & Dixon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Smith & Kay & Dixon & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Smith & Kay & Dixon & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Smith & Kay & Royyuru-545 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
59.	Smith & Hathaway & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Smith & Hathaway & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Google Wallet Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and Magento/PayPal, LoopPay Tokenization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Google Wallet Combined with Known Credit Card CVV and CVC and Expiration Date Techniques	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Google Wallet Combined with Known User Interface Techniques Combined with Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
65.	Google Wallet Combined with Known User Interface Techniques Combined with Deibert & Mistry &/or Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Smith & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Smith & Kay & Royyuru-545 & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

'579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	& Power																							
69.	Royyuru-545 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Royyuru-545 & Phillips & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Royyuru-545 & Gomez & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
72.	Royyuru-545 & Phillips & Casey & Hathaway & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
73.	Royyuru-545 & Phillips & Casey & Kay & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Royyuru-545 & Phillips & Casey & Cox & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75.	Royyuru-545 & Phillips & Casey & Qasim & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Royyuru-545 & Phillips & Casey & Amacker & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Gomez & Amacker & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Gomez & Amacker & Mullen-915 & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Gomez & Amacker & Mullen-915 & Smith & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Law-540 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
81.	Law-540 & Phillips & Giordano	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
82.	Law-540 & Phillips & Giordano & Diebert	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
83.	Law-540 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
84.	Royyuru-545 & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X
85.	Royyuru-545 & Phillips & Casey & Law-540 & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Royyuru-545 & Giordano & Phillips &	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Casey																							
87.	Law-540 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Law-540 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
89.	Law-540 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Law-540 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Law-540 & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Google Wallet & Gomez & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Gomez & Amacker & Mullen-915 & Carlson & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Law-540 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Law-540 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Royyuru-545 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
97.	Law-540 & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
98.	Law-540 & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
99.	Smith & Kay & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100.	Smith & Kay & Hathaway & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
101.	Law-540 & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102.	Smith & Cox & Hathaway & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
103.	Smith & Kay & Shoemaker & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
104.	Law-540 & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
105.	Law-540 & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
106.	Law-540 & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’579 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
107.	Smith & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108.	Smith & Hathaway & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
109.	Smith & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
110.	Law-540 & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
111.	Law-540 & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
112.	Law-540 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
113.	Law-540 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
114.	Law-540 & Phillips & Smith & Power & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
115.	Gomez & Amacker & Mullen-915 & Power & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
116.	Google Wallet & Royyuru-545 & Phillips & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
117.	Google Wallet & Gomez & Phillips & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
118.	Google Wallet & Gomez & Phillips & Law-540 & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
119.	Royyuru-545 & Phillips & Casey & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
120.	Royyuru-545 & Phillips & Casey & Spodak & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
121.	Royyuru-545 & Phillips & Casey & Spodak & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
122.	Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
123.	Gomez & Amacker & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
124.	Gomez & Amacker & Spodak & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
125.	Gomez & Amacker & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
126.	Gomez & Amacker & Spodak & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’579 Patent																								
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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
127.	Gomez & Amacker & Spodak & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
128.	Google Wallet & Royyuru-545 & Phillips & Casey & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
129.	Google Wallet & Royyuru-545 & Phillips & Casey & Spodak & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
130.	Google Wallet & Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
131.	Google Wallet & Gomez & Amacker & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
132.	Google Wallet & Gomez & Amacker & Spodak & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
133.	Google Wallet & Gomez & Amacker & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
134.	Google Wallet & Gomez & Amacker & Spodak & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
135.	Google Wallet & Gomez & Amacker & Spodak & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
136.	Google Wallet & Royyuru-545 & Phillips & Casey & Spodak & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
137.	Google Wallet & Gomez & Amacker & Spodak & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
138.	Gomez & Amacker & Spodak & Carlson & Royyuru-545 & Aabye & Pisula	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

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’538 Patent																															
No.	Prior Art Combination	Asserted Claims Rendered Obvious																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1.	Royyuru-545 & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.	Google Wallet & Royyuru-545 & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.	Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.	Royyuru-545 & Phillips & Casey & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.	Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.	Google Wallet & Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.	Gomez & Amacker & Mullen-915 & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Gomez & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Gomez & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Gomez & Amacker & Mullen-915 & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.	Gomez & Amacker & Mullen-915 & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Gomez & Amacker & Mullen-915 & Royyuru-545 & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Gomez & Amacker & Mullen-915 & Royyuru-545 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Gomez & Amacker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Gomez & Amacker & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Google Wallet & Gomez & Amacker & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.	Gomez & Amacker & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Gomez & Amacker & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Royyuru-545 & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Royyuru-545 & Amacker & Mullen-915 &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’538 Patent																																
No.	Prior Art Combination	Asserted Claims Rendered Obvious																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Smith																														
22.	Royyuru-545 & Amacker & Mullen-915 & Smith & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Royyuru-545 & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Mullen-876 & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Mullen-876 & Hathaway & Assora	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Mullen-876 & Hathaway & Assora & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Mullen-876 & Hathaway & Assora & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28.	Mullen-876 & Hathaway & Phillips	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29.	Google Wallet & Mullen-876 & Hathaway & Phillips	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Mullen-876 & Hathaway & Phillips & Assora	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.	Mullen-876 & Hathaway & Phillips & Assora & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Mullen-876 & Hathaway & Phillips & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Mullen-876 & Hathaway & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Google Wallet Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and Magento/PayPal, LoopPay Tokenization[5]	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

[5] The Google Wallet invalidity charts for each patent provide further detail regarding the combinations and motivations to combine.

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’538 Patent																																
No.	Prior Art Combination	Asserted Claims Rendered Obvious																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Those Specified by 2011 EMV Standards																														
36.	Google Wallet & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Google Wallet & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Royyuru-545 & Phillips & Casey & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Royyuru-545 & Phillips & Casey & Carlson & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Royyuru-545 & Phillips & Casey & Law-750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Gomez & Amacker & Smith & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Gomez & Amacker & Smith & Carlson & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Gomez & Amacker & Smith & Law-750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Royyuru-545 & Amacker & Mullen-915 & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Royyuru-545 & Amacker & Mullen-915 & Carlson & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47.	Royyuru-545 & Amacker & Mullen-915 & Law-750	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Royyuru-545 & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Royyuru-545 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Google Wallet & Royyuru-545 & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
51.	Google Wallet & Royyuru-545 & Casey & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Google Wallet & Royyuru-545 & Casey &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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’538 Patent																															
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		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	Law-540 & Giordano																														
53.	Google Wallet & Law-540 & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.	Google Wallet & Law-540 & Casey & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Royyuru-545 & Phillips & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Royyuru-545 & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Gomez & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Law-540 & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
59.	Law-540 & Amacker & Mullen-915 & Google Wallet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Law-540 & Amacker & Mullen-915 & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Gomez & Amacker & Smith & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Gomez & Amacker & Cox & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Law-540 & Amacker & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Gomez & Amacker & Hird & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
65.	Royyuru-545 & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Mullen-876 & Hathaway & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Law-540 & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Mullen-876 & Hathaway & Assora & Giordano	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
69.	Mullen-876 & Hathaway & Phillips & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Google Wallet & Law-540 & Hathaway & Phillips	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Google Wallet & Gomez & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
72.	Google Wallet & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’538 Patent																																
No.	Prior Art Combination	Asserted Claims Rendered Obvious																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
73.	Google Wallet & Cox & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards & Gomez & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75.	Law-540 & Phillips & Casey & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Gomez & Amacker & Smith & Rans & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Law-540 & Amacker & Smith & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Law-540 & Amacker & Mullen-915 & Rans	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Gomez & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Gomez & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
81.	Google Wallet & Gomez & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
82.	Google Wallet & Gomez & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83.	Google Wallet & Gomez & Phillips & Casey & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
84.	Google Wallet & Gomez & Phillips & Casey & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
85.	Google Wallet & Gomez & Phillips & Casey & Law-540 & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Google Wallet & Gomez & Casey & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87.	Google Wallet & Gomez & Phillips & Casey & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Google Wallet & Gomez & Phillips & Casey & Law-540 & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’538 Patent																															
No.	Prior Art Combination	Asserted Claims Rendered Obvious																													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
89.	Gomez & Phillips & Casey & Casey II	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Gomez & Phillips & Casey & Habraken	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Gomez & Phillips & Casey & Law-540 & Casey II	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Gomez & Phillips & Casey & Law-540 & Habraken	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Google Wallet & Gomez & Phillips & Casey & Casey II	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Google Wallet & Gomez & Phillips & Casey & Habraken	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Google Wallet & Gomez & Phillips & Casey & Royyuru-545 & Casey II	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Google Wallet & Gomez & Phillips & Casey & Royyuru-545 & Habraken	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

<u>’634 Patent (Claims 1-13, 15-24)</u>

’634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
1.	Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.	Royyuru-545 & Phillips & Casey & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.	Royyuru-545 & Phillips & Casey & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.	Royyuru-545 & Phillips & Casey & Mistry & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.	Royyuru-545 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
	& Civelli																								
8.	Royyuru-545 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Google Wallet & Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Royyuru-545 & Phillips & Casey & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.	Royyuru-545 & Phillips & Casey & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Gomez & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Gomez & Amacker & Mullen-915 & Smith & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Google Wallet & Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Gomez & Amacker & Mullen-915 & Smith & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.	Gomez & Amacker & Mullen-915 & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Gomez & Amacker & Mullen-915 & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Royyuru-545 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Royyuru-545 & Phillips & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22.	Royyuru-545 & Gomez & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Royyuru-545 & Phillips & Casey & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Royyuru-545 & Phillips & Casey & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Royyuru-545 & Phillips & Casey & Qasim	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Royyuru-545 & Phillips & Casey &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

'634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
	Amacker																							
28.	Gomez & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29.	Gomez & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Gomez & Amacker & Mullen-915 & Cox & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.	Smith & Deibert & Amacker &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Smith & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Smith & Kay & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Smith & Kay & Cox & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.	Smith & Kay & Cox & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Smith & Kay & Cox & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Smith & Kay & Cox & Mistry & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Smith & Kay & Cox & Purdy & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Google Wallet & Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Smith & Cox & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Smith & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Smith & Kay & Royyuru-545 & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Smith & Kay & Royyuru-545 & Deibert & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Smith & Kay & Royyuru-545 & Deibert & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Smith & Kay & Royyuru-545 & Deibert & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47.	Smith & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Smith & Kay & Dixon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Smith & Kay & Dixon & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Smith & Kay & Dixon & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
51.	Smith & Kay & Royyuru-545 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Smith & Hathaway & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
53.	Smith & Hathaway & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.	Google Wallet Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and Magento/PayPal, LoopPay Tokenization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Google Wallet Combined with Known Credit Card CVV and CVC and Expiration Date Techniques	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Google Wallet Combined with Known User Interface Techniques Combined with Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Google Wallet Combined with Known User Interface Techniques Combined with Deibert & Mistry &/or Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
59.	Smith & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Smith & Kay & Royyuru-545 & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Royyuru-545 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Royyuru-545 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Royyuru-545 & Phillips & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Royyuru-545 & Gomez & Mullen-915 &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
	Power																								
65.	Royyuru-545 & Phillips & Casey & Hathaway & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Royyuru-545 & Phillips & Casey & Kay & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Royyuru-545 & Phillips & Casey & Cox & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Royyuru-545 & Phillips & Casey & Qasim & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
69.	Royyuru-545 & Phillips & Casey & Amacker & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Gomez & Amacker & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Gomez & Amacker & Mullen-915 & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
72.	Gomez & Amacker & Mullen-915 & Smith & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
73.	Law-540 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Law-540 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75.	Royyuru-545 & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Royyuru-545 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Law-540 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Law-540 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Law-540 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Law-540 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
81.	Law-540 & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	**Prior Art Combination**	**Asserted Claims Rendered Obvious**																						
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
82.	Google Wallet & Gomez & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83.	Gomez & Amacker & Mullen-915 & Carlson & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
84.	Law-540 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
85.	Law-540 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Royyuru-545 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87.	Law-540 & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Law-540 & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
89.	Smith & Kay & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Smith & Kay & Hathaway & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Law-540 & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Smith & Cox & Hathaway & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Smith & Kay & Shoemaker & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Law-540 & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Law-540 & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Law-540 & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
97.	Smith & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
98.	Smith & Hathaway & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
99.	Smith & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100.	Law-540 & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
101.	Law-540 & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102.	Law-540 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17	18	19	20	21	22	23	24
103.	Law-540 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
104.	Gomez & Amacker & Mullen-915 & Power & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
105.	Google Wallet & Gomez & Law-540 & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
106.	Gomez & Amacker & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
107.	Gomez & Amacker & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108.	Gomez & Amacker & Casey & Chin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
109.	Google Wallet & Gomez & Amacker & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
110.	Google Wallet & Gomez & Amacker & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
111.	Google Wallet & Gomez & Amacker & Casey & Chin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

<u>’634 Patent (Claims 25-47)</u>

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
1.	Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.	Royyuru-545 & Phillips & Casey & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.	Royyuru-545 & Phillips & Casey & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.	Royyuru-545 & Phillips & Casey & Mistry & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.	Royyuru-545 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

'634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	& Civelli																								
8.	Royyuru-545 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Google Wallet & Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Royyuru-545 & Phillips & Casey & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.	Royyuru-545 & Phillips & Casey & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Gomez & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Gomez & Amacker & Mullen-915 & Smith & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Google Wallet & Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Gomez & Amacker & Mullen-915 & Smith & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.	Gomez & Amacker & Mullen-915 & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Gomez & Amacker & Mullen-915 & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Royyuru-545 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Royyuru-545 & Phillips & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22.	Royyuru-545 & Gomez & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Royyuru-545 & Phillips & Casey & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Royyuru-545 & Phillips & Casey & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Royyuru-545 & Phillips & Casey & Qasim	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Royyuru-545 & Phillips & Casey &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	Amacker																							
28.	Gomez & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29.	Gomez & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Gomez & Amacker & Mullen-915 & Cox & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.	Smith & Deibert & Amacker &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Smith & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Smith & Kay & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Smith & Kay & Cox & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.	Smith & Kay & Cox & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Smith & Kay & Cox & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Smith & Kay & Cox & Mistry & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Smith & Kay & Cox & Purdy & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Google Wallet & Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Smith & Cox & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Smith & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Smith & Kay & Royyuru-545 & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Smith & Kay & Royyuru-545 & Deibert & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Smith & Kay & Royyuru-545 & Deibert & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Smith & Kay & Royyuru-545 & Deibert & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47.	Smith & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Smith & Kay & Dixon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Smith & Kay & Dixon & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Smith & Kay & Dixon & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
51.	Smith & Kay & Royyuru-545 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Smith & Hathaway & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
53.	Smith & Hathaway & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.	Google Wallet Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and Magento/PayPal, LoopPay Tokenization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Google Wallet Combined with Known Credit Card CVV and CVC and Expiration Date Techniques	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Google Wallet Combined with Known User Interface Techniques Combined with Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Google Wallet Combined with Known User Interface Techniques Combined with Deibert & Mistry &/or Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
59.	Smith & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Smith & Kay & Royyuru-545 & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Royyuru-545 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Royyuru-545 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Royyuru-545 & Phillips & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Royyuru-545 & Gomez & Mullen-915 &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
	Power																								
65.	Royyuru-545 & Phillips & Casey & Hathaway & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Royyuru-545 & Phillips & Casey & Kay & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Royyuru-545 & Phillips & Casey & Cox & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Royyuru-545 & Phillips & Casey & Qasim & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
69.	Royyuru-545 & Phillips & Casey & Amacker & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Gomez & Amacker & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Gomez & Amacker & Mullen-915 & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
72.	Gomez & Amacker & Mullen-915 & Smith & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
73.	Law-540 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Law-540 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75.	Royyuru-545 & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Royyuru-545 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Law-540 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Law-540 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Law-540 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Law-540 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
81.	Law-540 & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
82.	Google Wallet & Gomez & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83.	Gomez & Amacker & Mullen-915 & Carlson & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
84.	Law-540 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
85.	Law-540 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Royyuru-545 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87.	Law-540 & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Law-540 & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
89.	Smith & Kay & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Smith & Kay & Hathaway & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Law-540 & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Smith & Cox & Hathaway & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Smith & Kay & Shoemaker & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Law-540 & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Law-540 & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Law-540 & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
97.	Smith & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
98.	Smith & Hathaway & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
99.	Smith & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100.	Law-540 & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
101.	Law-540 & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102.	Law-540 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
103.	Law-540 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
104.	Gomez & Amacker & Mullen-915 & Power & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
105.	Google Wallet & Gomez & Law-540 & Hird	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
106.	Gomez & Amacker & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
107.	Gomez & Amacker & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
108.	Gomez & Amacker & Casey & Chin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
109.	Google Wallet & Gomez & Amacker & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
110.	Google Wallet & Gomez & Amacker & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
111.	Google Wallet & Gomez & Amacker & Casey & Chin	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

<u>’634 Patent (Claims 48-53, 55-70, 72)</u>

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
1.	Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.	Royyuru-545 & Phillips & Casey & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4.	Royyuru-545 & Phillips & Casey & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5.	Royyuru-545 & Phillips & Casey & Mistry & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6.	Royyuru-545 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7.	Royyuru-545 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

'634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
	& Civelli																							
8.	Royyuru-545 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.	Google Wallet & Royyuru-545 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.	Royyuru-545 & Phillips & Casey & Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.	Royyuru-545 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.	Royyuru-545 & Phillips & Casey & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.	Gomez & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14.	Gomez & Amacker & Mullen-915 & Smith & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15.	Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.	Google Wallet & Gomez & Amacker & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17.	Gomez & Amacker & Mullen-915 & Smith & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18.	Gomez & Amacker & Mullen-915 & Carlson	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19.	Gomez & Amacker & Mullen-915 & Carlson & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20.	Royyuru-545 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21.	Royyuru-545 & Phillips & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22.	Royyuru-545 & Gomez & Mullen-915	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23.	Royyuru-545 & Phillips & Casey & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24.	Royyuru-545 & Phillips & Casey & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25.	Royyuru-545 & Phillips & Casey & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26.	Royyuru-545 & Phillips & Casey & Qasim	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27.	Royyuru-545 & Phillips & Casey &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
	Amacker																							
28.	Gomez & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
29.	Gomez & Amacker & Mullen-915 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
30.	Gomez & Amacker & Mullen-915 & Cox & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
31.	Smith & Deibert & Amacker &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
32.	Smith & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
33.	Smith & Kay & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
34.	Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35.	Smith & Kay & Cox & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
36.	Smith & Kay & Cox & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
37.	Smith & Kay & Cox & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38.	Smith & Kay & Cox & Mistry & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39.	Smith & Kay & Cox & Purdy & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
40.	Google Wallet & Smith & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
41.	Smith & Cox & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
42.	Smith & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
43.	Smith & Kay & Royyuru-545 & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
44.	Smith & Kay & Royyuru-545 & Deibert & Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
45.	Smith & Kay & Royyuru-545 & Deibert & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
46.	Smith & Kay & Royyuru-545 & Deibert & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
47.	Smith & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
48.	Smith & Kay & Dixon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
49.	Smith & Kay & Dixon & Hathaway	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
50.	Smith & Kay & Dixon & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
51.	Smith & Kay & Royyuru-545 & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52.	Smith & Hathaway & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
53.	Smith & Hathaway & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
54.	Google Wallet Combined with Known Tokenization Standards and Systems, Including Visa, Mastercard Paypass, AMEX Express Pay, PCI, EMV, and Magento/PayPal, LoopPay Tokenization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
55.	Google Wallet Combined with Known Algorithms and Data Sets for Generating Cryptograms and Related Data, Including Those Specified by 2011 EMV Standards	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
56.	Google Wallet Combined with Known Credit Card CVV and CVC and Expiration Date Techniques	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
57.	Google Wallet Combined with Known User Interface Techniques Combined with Gomez	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
58.	Google Wallet Combined with Known User Interface Techniques Combined with Deibert & Mistry &/or Civelli	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
59.	Smith & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
60.	Smith & Kay & Royyuru-545 & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
61.	Royyuru-545 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
62.	Royyuru-545 & Phillips & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
63.	Royyuru-545 & Phillips & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
64.	Royyuru-545 & Gomez & Mullen-915 &	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

'634 Patent																									
No.	Prior Art Combination	Asserted Claims Rendered Obvious																							
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
	Power																							
65.	Royyuru-545 & Phillips & Casey & Hathaway & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
66.	Royyuru-545 & Phillips & Casey & Kay & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
67.	Royyuru-545 & Phillips & Casey & Cox & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
68.	Royyuru-545 & Phillips & Casey & Qasim & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
69.	Royyuru-545 & Phillips & Casey & Amacker & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
70.	Gomez & Amacker & Mullen-915 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
71.	Gomez & Amacker & Mullen-915 & Smith & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
72.	Gomez & Amacker & Mullen-915 & Smith & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
73.	Law-540 & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
74.	Law-540 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
75.	Royyuru-545 & Phillips & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
76.	Royyuru-545 & Giordano & Phillips & Casey	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
77.	Law-540 & Phillips & Casey & Mistry	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
78.	Law-540 & Phillips & Casey & Civelli & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
79.	Law-540 & Phillips & Casey & Civelli & Purdy	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
80.	Law-540 & Phillips & Casey & Deibert	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
81.	Law-540 & Amacker & Mullen-915 & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

'634 Patent																								
No.	Prior Art Combination	Asserted Claims Rendered Obvious																						
		48	49	50	51	52	53	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	72
82.	Google Wallet & Gomez & Amacker & Mullen-915 & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
83.	Gomez & Amacker & Mullen-915 & Carlson & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
84.	Law-540 & Phillips & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
85.	Law-540 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
86.	Royyuru-545 & Phillips & Giordano & Smith	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87.	Law-540 & Amacker & Mullen-915 & Smith & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
88.	Law-540 & Kay	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
89.	Smith & Kay & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
90.	Smith & Kay & Hathaway & Spodak	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
91.	Law-540 & Kay & Cox	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
92.	Smith & Cox & Hathaway & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
93.	Smith & Kay & Shoemaker & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
94.	Law-540 & Kay & Shoemaker	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
95.	Law-540 & Kay & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
96.	Law-540 & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
97.	Smith & Kay & Giordano & Royyuru-545	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
98.	Smith & Hathaway & Casey & Law-540	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
99.	Smith & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
100.	Law-540 & Kay & Royyuru-545 & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
101.	Law-540 & Kay & Royyuru-545 & Spodak & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
102.	Law-540 & Phillips & Casey & Deibert & Power	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EXHIBIT I: OBVIOUSNESS COMBINATIONS

’634 Patent																								
No.	**Prior Art Combination**	**Asserted Claims Rendered Obvious**																						
		48	**49**	**50**	**51**	**52**	**53**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**72**
103.	Law-540 & Phillips & Smith & Power	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
104.	Gomez & Amacker & Mullen-915 & Power & Law-540	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
105.	Google Wallet & Gomez & Law-540 & Hird	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
106.	Gomez & Amacker & Casey	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
107.	Gomez & Amacker & Casey & Law-540	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
108.	Gomez & Amacker & Casey & Chin	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
109.	Google Wallet & Gomez & Amacker & Casey	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
110.	Google Wallet & Gomez & Amacker & Casey & Law-540	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
111.	Google Wallet & Gomez & Amacker & Casey & Chin	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

<u>Motivations to Combine:</u>

The prior art references relate to payment card and contactless transaction techniques and devices. Gomez relates to “a payment card system [that] uses a static payment card identifying number and generates, for each attempted transaction, an authentication cryptogram.” Gomez at Abstract. Kay relates to systems and methods that “allow greater access to a banking platform via a mobile device” including “initiat[ing] a financial transaction using a mobile device” and completing a “financial transaction at [a] financial transaction terminal using the mobile device as a user interface.” Kay ¶ [0004]. Mullen-915 relates to a mobile device that may be used for various transactions, such as acting as a point-of-sale terminal, where a contactless communication channel may be formed between

the mobile device and a payment card to communicate payment information to, for example, complete a purchase transaction. Mullen-915 ¶¶ [0002]-[0071]. Gill relates to an improvement in ATM technology concerning wireless ATM transactions. Gill at 1:14-2:44. Assora relates to "[a] Disposable Credit Card Number (DCCN)," including "a scheme for off-line generation of the DCCNs" that "uses a pre-shared secret key between the issuer and the client to generate Hashed Message Authentication Code for some selected data from the transaction." Assora at 146 (Abstract). Javani relates to "a one-time-use transaction number generation method" to increase credit card transaction security. Javani at 060 (Abstract). Hathaway "relates generally to credit cards and other types of payment cards, and more particularly to techniques for enhancing the security of such cards as well as transactions involving such cards." Hathaway ¶ [0001]. Royyuru-545 relates to "[m]ethods, systems, and machine-readable media . . . for handling information related to a financial transaction including utilizing dynamic cryptograms." Royyuuru-545 at Abstract. Carlson relates to "a device and methods for conducting transactions using pseudo primary account identifiers from portable wireless devices." Carlson ¶ [0012]. Cox relates to "[a] handheld unit which is capable of emulating a plurality of smartcards or magnetic stripe cards," "has the capability of storing a plurality of data sets representing a plurality of accounts," and "is equipped with an RF interface that can emulate a smartcard interface that is capable of communicating with smartcard readers at POS or ATM terminals, or anywhere else a smartcard may be utilized." Cox at Abstract. Doughty "relates generally to the field of electronic devices and equipment used in the authentication and processing of commercial and security related transactions and, more particularly, to a system, method and apparatus for enabling transactions using user enabled programmable magnetic stripes." Doughty at Abstract. Royyuru-866 relates to "methods and systems for executing financial transactions between customers and merchants" including those using cryptograms, encrypted authorization requests, and

similar features. Royyuru-866 at 2:27-3:31. Mullen-431 relates to payment methods and systems involving a mobile device, which may be used in combination with a card, such that the payment device receives security credentials, payment information, and the like, from the card device. Mullen-431 at 1:27-63. Shoemaker relates to apparatuses and methods that are "backward compatible with existing card processing infrastructure" and "furnish dynamically configurable data to a card reader to facilitate transactions such as credit card transactions," and techniques to reduce transaction fraud and "to improve efficiency for cardholders, card issuers, and intermediary institutions." Shoemaker at Abstract. Mjølsnes relates to an online wallet system and architecture that would improve security and functionality of magnetic stripe and chip cards with enhancements to their functionality, and accommodate secure mobile payments from user devices. Mjølsnes at 87. Qasim relates to mobile payment platforms that provide the user quick and easy access to their credit card via their mobile phone. Qasim at 32. Killoran relates to a secure wireless financial transaction system for mobile commerce. Killoran at 1060. Dixon relates to handheld device payment security concerns including "[d]etecting potential misuse of a primary account number (PAN) associated with a first handheld media." Dixon at Abstract. Spitzer "relates generally to portable transaction devices, and more specifically to portable transaction devices having various security features." Spitzer at 1:5-7. Boalt "relates generally to credit card transactions, and more particularly relates to credit or debit cards that have, and wirelessly and/or magnetically transmit, account access codes that are valid for a limited time." Boalt ¶ [0002]. Jones "relates generally to financial transaction security, and more particularly to authentication in financial transactions in which near field communication (NFC) is used." Jones ¶ [0001]. Yoo relates to "a mobile phone that is universal serial bus (USB)-based to allow for connection to a personal computer (PC) such that data transmission therebetween may be easily and efficiently performed." Yoo ¶ [0002]. Phillips relates to an "apparatus and methods including a user

interface to facilitate and enhance the use of mobile telephones and/or other portable devices that have payment-related IC's that can be used for contactless payment transactions and other types of transactions," and "features and ways of interacting with a contactless payment-enabled mobile telephone." Phillips ¶ [0005]. Casey "relates generally to electronic devices, and, more particularly to graphical user interfaces configured to receive motion based inputs for confirming a payment transaction." Casey at 5-9. Deibert relates to "[a] method and system for payments for mobile phone payments with a disabling feature" including "activating a mobile phone containing contactless payment systems, and having a timeout feature disable the contactless payment systems after a set period of time." Deibert at Abstract. Kay provides additional features such as a time displayed on a mobile phone payment interface, in addition to information regarding entry of a passcode or sequence code (*e.g.*, a PIN), and a currency amount for a transaction, *see, e.g.*, Kay at FIGs. 4A-4E. Mullen-876 relates to systems and methods for increasing transaction security including generating a dynamic number or dynamic verification code that can be displayed on or communicated by a payment device to perform a transaction. Mullen-876 at Abstract. Mullen-701 relates to "[a] payment card (*e.g.*, credit and/or debit card) or other device (*e.g.*, mobile telephone) is provided with a magnetic emulator operable to communicate data to a magnetic stripe read-head." Mullen-701 at Abstract. Hird relates to "[m]ethods and devices for pre-generating session keys for securing transactions," including securing a transaction by generating a cryptogram "based on one of the encrypted session cryptographic keys and transaction data for the transaction." Hird at Abstract. Smith "relates to the mapping of a mobile cloud account to a payment account" including "using a mobile cloud account to conduct contactless payment transactions without modification to legacy issuer processing systems." Smith ¶[0002]. Royyuru-035 relates to "[m]ethods, systems, and machine-readable media . . . for handling information related to a transaction conducted with a presentation instrument at a POS

device." Royyuru-035 at Abstract. Google Wallet was a secure mobile device wallet in public use before the time of the alleged invention. Mistry relates to various user interface functions in a mobile device, including those related to mobile payments. *See, e.g.*, Mistry ¶ [0024]. Civelli relates to an electronic device with user authentication features. Civelli at Abstract. Purdy relates to known user-interface techniques on mobile devices. *See generally*, Purdy. Law-750 relates to the authentication of a transaction originating from a mobile device by using a mobile device ID, payment information associated with the mobile device ID, and supplemental information including, for example, a PIN, a password, a security question, or biometric data (*e.g.*, voice data, fingerprints, eye scan etc.). Law-750 ¶¶ [0052]-[0053], [0067]. Power relates to a payment card that includes a transducer that detects a physical phenomenon which enables a wireless communication circuit in or on the payment card to be activated to provide the user's financial information to an external reading device. *See generally*, Power. Rans relates to methods and systems for two-factor authentication using contactless chip cards or contactless payment devices that allow for additional security by using a PIN, a challenge, or some other input to generate a dynamic value that formulates authentication data. Rans ¶¶ [0005], [0020]. Nasiri relates to handheld electronic devices including motion sensing and processing capabilities via gyroscopes, accelerometers, optical sensors, and other motion sensor components. Nasiri at Abstract. Law-540 relates to systems and methods for facilitating contactless payment using NFC-capable devices and payment gateway servers including steps related to the use of substitute payment information and dynamic generation of payment details. Law-540 at Abstract, ¶¶ [0082], [0142]. Spodak relates to a universal card with the NFC communication abilities of a traditional credit card, allowing it to be used at any type of terminal for short range wireless transactions. Spodak at Abstract, ¶¶ [0002], [0007] Giordano relates to obfuscating payment information for financial transactions via NFC. Giordano at Abstract. Rigatti relates to a payment card reading device. Rigatti

at Abstract. Marvit concerns a mobile device that can be controlled by device motion. Marvit at Abstract. Chin relates to improved security of a mobile device throgh touch-based user authentication. Chin at 1:13-15. Casey II relates to controlling access to information stored on a mobile device. Casey II at 1:6-10. Habraken relates to secure access techniques and authentication of physical devices with multiple communication interfaces. Habraken ¶ [0002]. Aabye relates to system, apparatus, and method for preventing the unauthorized access to a payment application installed on an NFC-enabled mobile payment device and biometric sensing of said device. Aabye ¶¶ [0050], [0055]. Pisula relates to determining "whether the detected interaction by the user with the first physical button corresponds to a second predefined action" which is "a double activation of the first physical button in a predefined time period (e.g., pressing the menu button 204 twice in succession in 0.3 seconds) (5018)." Pisula at 28:57-64.

A person of ordinary skill in the art reading Gomez would have understood the disclosed goal of reducing transaction theft by using an authentication cryptogram. Gomez at 1:58-2:44. A person of ordinary skill in the art reading Kay would have understood the disclosed features of a time displayed on a mobile phone payment interface, in addition to information regarding entry of a passcode or sequence code (*e.g.*, a PIN), and a currency amount for a transaction. *See, e.g.*, Kay at FIGs. 4A-4E. A person of ordinary skill in the art reading Mullen-915 would have understood the disclosed features of generating and displaying all or a portion of dynamic numbers (such as a dynamic security code) and graphical information as part of the transaction process *See, e.g.*, Mullen-915 ¶ [0434]. A person of ordinary skill in the art reading Gill would have understood the disclosed goal of enabling "'contactless' transactions" with ATM machines, similar to other contactless payment card and device transactions. Gill at 1:14-2:44. A person of ordinary skill in the art reading Assora would have understood the disclosed goal of increasing security while adding minimum overhead on the card

issuer and client, such as by having "the generated DCCN [have] all the features of classical credit card details." Assora at 146 (Abstract). A person of ordinary skill in the art reading Javani would have understood the disclosed goal of increasing credit card transaction security. Javani at 060 (Abstract). A person of ordinary skill in the art reading Hathaway would have understood the disclosed goal of "providing enhanced security in a credit card or other type of payment card." Hathaway ¶ [0006]. A person of ordinary skill in the art reading Royyuru-545 would have understood the disclosed goal of increasing transaction security, including by utilizing dynamic transaction cryptograms and dynamic primary account numbers. Royyuru-545 ¶ [0005]. A person of ordinary skill in the art reading Carlson would have understood the disclosed goal of conducting contactless payment transactions in a secure manner. Carlson ¶¶ [0002]-[0011]. A person of ordinary skill in the art reading Cox would have understood the disclosed goal of "a cost effective device capable of storing the information from multiple smartcards and data from multiple conventional magnetic stripe cards for use either through a magnetic stripe emulator or as a virtual contactless smartcard, and preventing both unauthorized use of the device and outright theft of the information on the device." Cox ¶ [0011]. A person of ordinary skill in the art reading Doughty would have understood the disclosed goal of increasing transaction security, including by using various forms of authentication such as biometric sensors, and implementing a time varying code used in the transaction. Doughty at 3:8-4:53. A person of ordinary skill in the art reading Royyuru-866 would have understood the disclosed additional features of cryptograms, public-key-private-key encryption, PIN usage, and similar features related to transaction security. *See, e.g.*, Royyuru-866 at 5:38-12:15. A person of ordinary skill in the art reading Mullen-431 would have understood the disclosed additional features related to, for example, communications between a mobile device and a card, and selecting one or more virtual cards from a displayed list of virtual cards for use during a

purchase transaction. *See, e.g.*, Mullen-431 at 2:12-4:24. A person of ordinary skill in the art reading Shoemaker would have understood the disclosed goals to "substantially reduce or to eliminate transaction fraud and to improve efficiency for cardholders, card issuers, and intermediary institutions." Shoemaker at Abstract. A person of ordinary skill in the art reading Mullen-876 would have understood the disclosed goal of "protecting against credit card fraud." Mullen-876 ¶ [0002]. A person of ordinary skill in the art reading Smith would have understood the disclosed goal of "facilitating the conducting of contactless payment transactions on a mobile device that does not require significant changes to legacy issuer processing systems." Smith ¶ [0005]. A person of ordinary skill in the art reading Google Wallet would have understood that there are a multitude of various technical and user-interface variations that could be implemented in a mobile payment system. *See* Google Wallet invalidity chart and evidence cited therein. A person of ordinary skill in the art reading Nasiri would have understood the disclosed goal of using accelerometers and gyroscopes to enhance motion sensing accuracy, performance, and reliability. Nasiri at 9:47-10:13, see similar in Marvit and Rigatti. A person of ordinary skill in the art reading Law-540 would have understood the disclosed goal of increasing transaction security with the use of application transaction counters (ATC), dynamic data, and secret keys. Law-540 ¶¶ [0144]-[0147]. A person of ordinary skill in the art reading Spodak would have understood the disclosed goal of generating a dynamic authentication value for a universal card for enhanced security. Spodak ¶¶ [89]-[94]. A person of ordinary skill in the art reading Giordano would have understood the disclosed goal of using an alias identifying the user to conduct transactions using NFC without needing to transfer the user's account number for enhanced security. Giordano at Abstract, ¶¶ [72]-[76], [81]-[87]. A person of ordinary skill in the art reading Chin would have understood the disclosed goal of improved security via user-generated pattern creation techniques. Chin at 10:6-16. A person of

ordinary skill in the art reading Casey II would have understood the disclosed goal of secure access to encrypted and/or hidden information. Casey II at 3:41-58. A person of ordinary skill in the art reading Habraken would have understood the disclosed goal of improving access to information via user authentication. Habraken ¶ [0083]. A person of ordinary skill in the art reading Aabye would have understood the disclosed goal of reducing unauthorized access to applications on the mobile device. Aabye ¶¶ [0054]-[0055], [0057]. A person of ordinary skill in the art reading Pisula would have understood the disclosed goal of button press techniques implemented in Pisula's mobile device (including a double button press and a long button press) to improve the mobile device function in minimizing unintentional activation of the device, increasing security. Pisula at 14:23-25, 28:57-29:4.

A person of ordinary skill in the art reading at least the above-noted portions of each of the prior art references would have understood the disclosed goal of the art, and would have looked to other prior art (also described above), for insight into implementing the prior art's teachings, given that the other art is in a similar technical field and addresses similar problems. Because the prior art references disclose similar steps and components that are highly compatible with each other, it would have been natural for one of ordinary skill in the art to contemplate adding to, modifying, or substituting one prior art's processes and/or components with those disclosd by one or more of the the other. To that end, and as further exemplary motivations to combine the references, each of the references discloses the following additional details suggesting the combination of the reference with the others

Gomez provides additional features such as a secure transaction system which requires "[n]o changes in the payment system infrastructure" and "may use a programmable magnetic stripe or contactless technology to provide total compatibility with existing POS equipment." Gomez at 2:40-44. Kay provides additional features such as a time displayed on a mobile phone payment interface, in

addition to information regarding entry of a passcode or sequence code (*e.g.*, a PIN), and a currency amount for a transaction. *See, e.g.*, Kay at FIGs. 4A-4E. Mullen-915 provides additional features such as generating and displaying all or a portion of dynamic numbers (such as a dynamic security code) and graphical information as part of the transaction process. *See, e.g.*, Mullen-915 ¶ [0434]. Gill provides the additional features of enabling "'contactless' transactions" with ATM machines, similar to other contactless payment card and device transactions, Gill at 1:14-2:44. Assora discloses certain additional features, such as ways to increase security while adding minimum overhead on the card issuer and client, including by having "the generated DCCN [have] all the features of classical credit card details." *See, e.g.*, Assora at 146 (Abstract). Javani provides additional features, such as specific details regarding limited-use transaction number generation, verification, and authentication. Javani at 061-064. Hathaway provides certain additional features, including "providing a dynamic secure payment card in which a portion of a payment card number itself is varied under the control of a time-based or event-based cryptographic one-time password algorithm," and "a display for outputting at least a portion of a dynamic account number." *See, e.g.*, Hathaway ¶¶ [0007]-[0008]. Royyuru-545 provides additional details and features related to utilizing dynamic cryptograms and substitute primary account numbers to enable more secure transactions. *See, e.g.*, Royyuru-545 ¶¶ [0005]-[0007]. Carlson provides additional details regarding the configuration and operation of a mobile device configured for secure mobile transactions, such as that "the user may . . . select which account he wishes to use to perform the transaction by selecting from among the one or more primary account identifiers that have been stored in the device" and "[s]election of a primary account on the portable wireless device can occur using any suitable input mechanism" including, for example, "keypad entry, touch screen entry, with or without a stylus, keyboard entry, voice response entry, and the like." Carlson ¶ [0033]. Cox provides the additional features related

to the implementation of secure payment systems, including for example, incorporating NFC capability and including biometric sensors to establish user identity before selecting a particular payment account. *See, e.g.*, Cox ¶¶ [0014], [0020]. Doughty provides the additional features related to increasing transaction security, such as including various forms of authentication including biometric sensors, and implementing a time varying code used in the transaction. Doughty at 3:8-4:53. Royyuru-866 provides the additional features relating to cryptograms, public-key-private-key encryption, PIN usage, and similar features related to transaction security. *See, e.g.*, Royyuru-866 at 5:38-12:15. Mullen-431 provides certain additional features related to, for example, communications between a mobile device and a card, and selecting one or more virtual cards from a displayed list of virtual cards for use during a purchase transaction. *See, e.g.*, Mullen-431 at 2:12-4:24. Shoemaker provides the additional teaching that "no visual indication of sensitive data such as embossed credit card numbers or names or expiration dates need to be provided on the active credit card, thereby rendering it impossible for a person standing nearby to snoop and memorize the data necessary to commit fraud at a later time" and further that "[i]f the transaction needs to take place in a manner that does not involve swiping, the one-time use token can be displayed on the card's display, allowing the cardholder to read off the one-time use token to accomplish the transaction." Shoemaker at 14:23-34. Mjølsnes provides the additional features such as permitting the same PIN to be used to access a user's wallet application instead of needing a separate PIN for each card. *See, e.g.*, Mjølsnes at 95. Qasim provides additional features including displaying payment information on a mobile phone to perform a transaction. Qasim at 32. Killoran provides additional details regarding features including authenticating and processing a financial transaction, and encryption methods and algorithms. Killorian at 1061-62. Dixon provides the additional features of a "transaction counter [that] may increment at least every time the handheld media is used." Dixon ¶ [0007]. Spitzer provides the additional

features of a card issuer authority generating a one-time use transaction number, in addition to various other security features such as biometric scanners. Spitzer at 3:19-4:5. Boalt provides the additional features of "a temporary code generator coupled to the memory and operable to generate a time-based code that is valid for only a finite amount of time" to be used in a card payment transaction. Boalt ¶¶ [0009]-[0018]. Jones provides the additional features of a set of sensors 101—including a GPS speed sensor, an accelerometer, and a gyroscope—where signals from the sensors are used to authenticate or authorize a user to initiate a contactless payment transaction. Jones ¶¶ [0017], [0018], [0034]. Yoo provides the additional details regarding implementation of USB in a mobile device. Yoo ¶¶ [0015]-[0097]. Phillips provides additional details related to mobile transaction features including receiving payment requests such as from a merchant terminal via RF (including NFC). Phillips ¶¶ [0023], [0027], [0057], [0072]. Casey provides the additional details regarding features such as displaying "an electronic wallet or payment service in response to receiving information through the network device 50, the NFC device 44, or other input structure such as a camera, or bar code reader." Casey at 8:52-9:8. Deibert provides additional features related to disabling a mobile phone payment after an elapsed time. Deibert ¶¶ [0006]-[0009]. Amacker provides additional features related to initiating mobile transactions, including methods and systems by which an entity may "transmit a request to the person's mobile device . . ., which in turn may present response options to the person," in response to which, the person may interact with "the mobile wallet server (*e.g.*, select "accept" or "reject" button, etc.) using a user interface of an application that is triggered (executed) upon receipt of the request from the entity." *See, e.g.*, Amacker at 2:37-3:57. Mullen-876 provides additional features including those relating to providing a dynamic credit card with a number that changes periodically or changes after each use, and can be transmitted to facilitate a payment transaction. *See e.g.*, Mullen-876 ¶ [0009]. Mullen-701 provides the additional features

of an external communication device, "[f]or example, a USB port or Wi-Fi antenna" that "may, for example, allow a user to communicate with stationary computer, laptop, or other device" for purposes such as, for example "load[ing] gift cards, or other information (*e.g.*, transactional or account information) from a laptop to a card or other device." Mullen-701 ¶ [0017]. Hird provides additional features regarding EMV-compliant payments involving cryptograms, including details regarding generating cryptograms and managing cryptographic keys and transaction counters. Hird at 3:55-12:67. Smith provides additional features related to "facilitating the conducting of contactless payment transactions on a mobile device that does not require significant changes to legacy issuer processing systems." Smith ¶ [0005]. Royyuru-035 provides additional features related to generating "a Dynamic Transaction Cryptogram (DTC) and a dynamic PAN that are each valid for only a single transaction." Royyuru-035 at Abstract. Google Wallet provides a multitude of additional features related to secure mobile device payments. *See* Google Wallet invalidity chart and evidence cited therein. Mistry provides additional features related to user interface and user detection including biometric sensors and "double pressing" inputs. Mistry ¶¶ [0173], [0218], [0224]. Civelli provides additional features such as detecting when an electronic device is in contact with a user and disabling a device when it is no longer in contact with the user. Civelli at Abstract. Purdy provides additional features regarding user interfaces and user interaction with mobile devices. *See generally*, Purdy. Law-750 provides additional features of revocation approaches as a security risk control mechanism by limiting the number of retry attempts when incorrect information is entered into a device to reduce the probability of a brute force attack being successful. Law-750 ¶¶ [0139]-[0142], [0149]. Power provides additional features of increasing the security of the user's financial information and promoting user trust by only providing the user's financial information in response to the user holding the payment card or the user removing the payment card from a storage location (such as the user's

wallet). Power at 2:61-3:5. Rans provides additional security features such as using a variety of variables in generating the dynamic value including a transaction counter that is stored internally, as well as an unpredictable number generated by the mobile device, or generated outside the mobile device, and appending a variety of variables to the authentication data in whole or in part. Rans ¶ [0023]. Nasiri provides additional features relating to multi-sensor arrangements using a multitude of different types of sensors (*e.g.*, barometers, magnetometers, temperature, optical, ultrasonic, radio frequency). Nasiri at 10:50-65. Law-540 provides additional features relating to cryptographic hashing and the use of cryptographic keys. Law-540 ¶ [0155]. Spodak provides additional features relating to an NFC-enabled universal card and a mobile device allowing a user to make contactless payments. Spodak at Abstract, ¶¶ [89]-[94], [138]. Giordano provides additional features relating to a static or dynamic alias for payment information. Giordano at Abstract, ¶¶ [72]-[76], [81]-[87].

Given at least the overlap of technical teachings, a person of ordinary skill in the art would have had a reasonable expectation of success in the combination. Accordingly, combining the teachings of of the prior art would have been merely: (a) a combination of prior art elements according to known methods to yield predictable results; (b) a simple substitution of one known element for another to obtain predictable results; (c) a use of known technique to improve similar devices in the same way; (d) application of a known technique to a known device ready for improvement to yield predictable results; (e) obvious to try; and/or (f) known work in one field of endeavor prompting variations of it for use in either the same field or a different one based on design incentives or other market forces since the variations are predictable to one of ordinary skill in the art.